

SAFETY LESSONS

If you push your luck on the job site, it will eventually push you back. Five builders who learned the hard way share their stories

by *JLC* staff

No house gets built without a certain amount of pain and bloodshed. Cuts, scrapes, blood blisters, and blue thumbnails are all in a day's work for many builders. Builders also tend to discount the kind of long-term injuries that develop over the course of years in the trades, including hearing damage, aching knees and elbows, and beat-up hands.

Unfortunately, this tough-it-out mentality has a way of spilling over into other areas. Cultivating a casual attitude toward the types of hazards that cause minor injuries can lead to carelessness about things like ladders, scaffolds, excavations, and other hazards that can send you to the hospital or kill you.

The following stories describe the experiences of a half-dozen builders who suffered serious on-the-job injuries. In most cases, the lessons are obvious. The trick is to recognize these sorts of situations as they develop, and head them off before you become a cautionary tale for the next guy.

Trench Safety

Trench-collapse accidents claim the lives of about 100 workers in this country each year. A cubic yard of average soil weighs about a ton and a half, and although the impact of falling soil can break bones or cause massive internal injuries, the immediate cause of death is usually suffocation: A victim buried to the chest or above typically can't expand his or her lungs enough to survive until rescued. And attempting to dig out a buried victim without taking proper precautions is itself tremendously risky. Multiple fatalities sometimes result when coworkers who rush to help are engulfed by a secondary collapse.

Excavating safely calls for experience and good judgment, including a working knowledge of various soil types. A good excavation sub will have all of these, but everyone who sets foot on a construction site should understand the basics of trench safety — not only for their own safety, but also for the protection of those around them:

- According to OSHA, vertical-sided trenches must not be more than 5 feet deep. For each foot of depth beyond that depth, the upper portion of the trench should be sloped 1 1/2 feet away from the excavation.
- Because the added weight of excavated soil increases the risk of collapse, dirt removed from a trench should be piled at least 2 feet away from the edges.
- Heavy equipment should not be operated near an open trench, because the resulting vibrations can cause the soil to collapse.
- While work is going on in a trench, someone at the surface should watch for danger signs, such as surface cracking or soil falling from the face of the excavation. Be aware, though, that soil may collapse with no warning at all.
- Trenches deeper than about 4 feet should have a ramp or ladder to allow workers to get out of the trench quickly if necessary and if there's time.
- Trust your instincts. If an excavation doesn't seem safe to you, stay out of it, and don't send anyone else into it.

Buried Alive

As a favor to a friend at the asphalt paving company where he worked, Jim Bagwell agreed to spend a Saturday morning hooking up a sewer line at an existing house. Using a rented backhoe, the friend dug down to the sewer pipe, about 14 feet below the level of the sidewalk. Digging the trench, Bagwell recalls, took longer than expected. "The dirt was real hard," he says. "It came up in big chunks."

Bagwell had already shoveled the dirt away from the buried pipe and knocked a hole in the side to make an opening for the new connection, when a section of the wall above suddenly collapsed — the result, he later learned, of unconsolidated soil in an old trench parallel to the one he was working in. "If we'd cut across the old trench, we would have known about it," Bagwell says. "But we didn't have any warning at all."

Bagwell was crouched over the open sewer pipe when the soil gave way. The backhoe bucket fortuitously protected his head, but his entire body was instantly buried beneath several thousand pounds of soil. He remained in that position, struggling for breath, for the next seven hours, as an area search and rescue unit shored up the trench with sheet pilings and hydraulic jacks before painstakingly digging him out. "My legs were folded up under me. The pain was bad for about an hour and a half — then they went to sleep," Bagwell recalls.

Onlookers cheered and applauded as the fully conscious Bagwell was hoisted out of the trench on a backboard, but in reality his ordeal was just beginning. Although he had no broken bones or other obvious injuries, like most trench-collapse survivors, he was suffering from a life-threatening injury known as Compartment Syndrome.

"The victim often looks great when he's rescued," says Dr. Jay Johannigman, a trauma surgeon at Cincinnati's University Hospital, where Bagwell was treated. "But soil pressure cuts off most of the blood flow to buried parts of the body, just like a tourniquet."

When the pressure is removed and circulation is restored, Johannigman explains, a flood of toxic substances that have formed in the dying muscle tissue surges into the bloodstream, damaging the kidneys and other organs. The damaged muscles swell grotesquely. To relieve the pressure, it's usually necessary to make a series of lengthwise incisions in the tough sheath that surrounds them. ("They cut me open from hip to knee," Bagwell recalls.) Limbs are often so badly damaged that they must be amputated. If the muscle damage is extensive enough, death is all but inevitable.

Bagwell was relatively lucky. He spent ten days in the hospital and endured weeks of painful physical therapy, but two months after being pulled out of the earth, he hobbled back to work with the aid of a pair of aluminum

forearm crutches.

He had little choice. Because his injuries were unconnected with his regular job, they weren't covered by workers' compensation, and Bagwell had no private medical insurance. "I've got to work," he says. "I've got to eat."

At first, he couldn't do much more than sit on an upturned plastic bucket and rake asphalt. Today, three years later, he's able to walk fairly easily on flat ground, but he still can't climb a ladder. "They tell me I'm as good as I'm going to get," he says.

Some days, that's not saying much. Permanent nerve damage in his legs means that he lives with a lot of pain, especially at night. "My legs cramp up," he says. "They draw up and my toes spread apart until I have to get up and walk around until I can lie down again and try to sleep. I've taken every kind of painkiller you can take, but they don't do much good." When it comes to excavation work, Bagwell now offers some simple advice: "Quit the job before you go down in a hole without a trench box."

Reported by ***Jon Vara.***

Defeated Guard Costs a Fingertip

Several years ago, I was running a crew that was in the middle of an interior trim job. There were some very complicated built-up crown moldings, some of which involved four, five, or six different pieces of stock. To simplify making all the necessary cuts, we'd developed a really slick plywood auxiliary fence for the miter saw that let us cut both narrow and wide material without spending any extra setup time. An unintended side effect was that the jig pushed the blade guard out of the way prematurely during miter cuts, but that seemed like a pretty minor problem. The jig was great, because we were facing a very tight deadline. We'd been working 12 hours a day, 6 days a week for some time, and we stood to lose a couple of thousand dollars if we didn't finish on schedule.

Late one morning, I was working the saw and passing material up to the three or four guys who were up on scaffolding. I'd mitered one end of a piece of dentil molding, and I reached out to clear the little offcut so I could turn it around and miter the other end. The blade jumped a little bit as the brake engaged, and I felt what I thought was a piece of offcut flick my finger. I thought, "Whoa, that was close." My next thought was, "If that was just a close call, why do I have my hand clamped under my arm?"

All things considered, I was pretty lucky. I'd taken off the tip of my index finger about halfway down the nail, just clipping off the end of the bone. In fact, I actually got out the first aid kit and went outside with it before I realized that this wasn't a problem I could handle with a couple of band-aids. One of the guys drove me to the hospital, while everybody else took time to clean up the blood that I'd spattered all around on my way to the door.

At the hospital, the doctor used the severed piece of my finger — which was still connected by a little flap of skin — to make a skin graft to cover the tip. It healed well, although it was very sensitive to cold that first winter. It also hurts a lot if I bang it on anything, and I have to keep what's left of the nail cut very short or it gets caught on things.

I was out of work for several days after the accident, and we missed out on the incentive clause in the contract. But, as it turned out, we would have missed the deadline anyway, because our supplier didn't deliver the doors on time. If we'd only known that earlier, we wouldn't have had to rush.

Eric Doherty *is the production manager for a home builder in upstate New York.*

Broken Back

I was the siding sub on a new house, and as the owner of the company, I was anxious to get the job done. So I decided to move things along by spending a Saturday putting up the cedar siding myself.

I drove to the site, put on my tool belt, and climbed up the 40-foot ladder leading to the roofing brackets we'd set up on a subsidiary roof below the gable end we were working on. It was a cold day, but the sun was out and soon I was making good progress. The next thing I knew, I was waking up in the hospital, hurting all over.

There are some things about what happened that morning that I'll never know, because no one was there to see it. I was hit on the head hard enough to permanently erase my memory of the minutes just before the accident as well as the accident itself — not an uncommon situation with head injuries, I'm told.

As best I can reconstruct it, here's what happened: I was near the end of a course of siding. Instead of climbing down the ladder and moving it over so I could finish from the ladder rather than standing on the staging, I must have reached way out to drive the last few nails. In the process, I put too much of my weight on the short length of scaffold plank that overhung the bracket. The plank kicked up and dumped me to the ground 30 feet below.

I was probably unconscious for a while after I hit the ground, but I temporarily came to long enough to crawl the 50 feet to my truck — the emergency workers later told me they could see the blood trail I'd left — and call 911 on my cell phone. At the hospital, they found that I'd fractured my T8 vertebra — which is located just about between your shoulder blades — and fractured a

rib, which had punched a hole in one of my lungs and partially collapsed it. I also had an ugly scalp wound, which took a lot of stitches to close up. I was in the hospital for about a week, then spent several more weeks recovering at home and going to physical therapy. I wasn't able to work again for three months.

One of the hardest things about being out of work was the feeling that I'd let down the guys who work for me. I didn't know how long it would be until I could work again, or what would happen with my business. So I had to tell these guys, some of whom had worked for me for years, that their best bet would be to find another job.

The accident has made me more careful about staging, and now when I put up a ladder, it's braced in as many ways as possible. Safety has become a big priority for me, but it's still a struggle to get the message to some of the younger guys who work for me. I recently saw a guy doing something I thought was unsafe, and I said to him, "Hey, what are you doing?" He answered, "Well, just because you broke your back doesn't mean I'm going to."

Bob Mullaney *is a contractor in Derry, N.H.*

Dumbwaiter Nearly Claims an Arm

I had just completed a new home in a remote area. The job included a two-story dumbwaiter, the second such unit I'd installed that year. The first installation was textbook, but the second was nothing but trouble. A week after I'd made what I thought were the final adjustments, the client called to say she couldn't open the access doors. A safety latch keeps them locked until the cab stops in precise alignment with the opening. The cab was raised and lowered by a 1/4-inch-diameter stranded-steel cable on a reversing winch and was configured to complete an up or down cycle before changing direction. I figured the problem had to be improper spooling of the cable due to a kink or slippage.

To open the door at the basement level, I overrode the safety latch and disabled the kill switch that stopped downward travel. Then I pressed the call button to drop the cab far enough to allow me to reach above it. I intended to grab the cable, pay it out all the way, pull out the slack, and then guide its rewind onto the spool. But when I activated the winch again, the cab went up, jamming my arm between its top and the opening header. The winch cranked away, pinching my arm down to the bone, just below the left elbow. After a moment of panic, I reached out with my foot and flipped the emergency switch. But I was stuck. Intense pain subsided into numbness during the minutes I struggled. Even though I was in a basement in the middle of nowhere, I yelled help a couple of times. Which, at the time, I actually found hilarious.

I could just reach my flat bar with my right foot and dragged it toward me. But prying between the cab and head jamb didn't relieve the pressure sufficiently for me to pull free. And with my arm jammed, I couldn't brace my body for proper leverage.

After being stuck like that for perhaps ten minutes and feeling desperate, I decided to pull as hard as I could, even if that meant losing a lot of the meaty part of my arm. I was ready to do whatever it took to get out. I hauled down hard, and my arm slowly scraped out of the crevice — thankfully intact, but scraped raw, and with a deep, bruised indentation and total numbness below the crease. I went outside in the sunshine to shake off the adrenaline. Ironically, the building inspector showed up a few minutes later to sign off on the occupancy permit.

The doctor found no permanent damage; six years later I have a faint crease across my forearm and slight, local numbness. It could have been a lot worse.

Although I was familiar enough with the system to properly handle the repair, at the time I was focused only on my annoyance and on getting the callback over with as fast as I could. I returned several days later to complete the adjustment, equipped with humility and plenty of mental rehearsal.

The writer wishes to remain anonymous.

Nail in the Eye

A friend and I were working on a new house. I was standing on a stepladder, taking a section of overhead floor apart by pulling the gun nails with my ripping-claw hammer, when a nail flew out of the claws and straight into my left eye. I ran around swearing, with the nail stuck deep into my eyeball, then reflexively pulled it out on the spot. There was a little bit of blood, but most of what leaked out was clear fluid.

My friend Webster Allen drove me to the local fire department, where an EMT put a patch on the eye, then wrapped a bandage around my head, covering both eyes to prevent sympathetic eye movement. From there, Webster drove me to the nearest emergency room and led me in by the hand.

ER doctors undid the bandage and found that the nail had struck directly in the pupil, but they found two holes — one from the nail, the other apparently from me pulling it out. They checked my eye with a flashlight, looking for pupil response, then covered my right eye. The doctor told me to look at a chart and tell what I saw. But I couldn't even see him, let alone the chart.

I was referred to a nearby ophthalmologist, who performed some more tests. He told me I'd lost quite a bit of fluid, done some damage, and would be unlikely to recover full vision in my left eye. He looked at the eye a

Accidents and Insurance

In the initial shock that accompanies a serious job-site accident, the last thing you'll be thinking about is how it will affect your liability insurance. But it won't be long before you'll have to think about that. A single accident is likely to boost your workers' comp rate for several years and may make it difficult for you to obtain coverage at all.

With rates already at an all-time high for many builders, and many insurance companies looking for any excuse to dump customers seen as bad risks, this is a good time to get serious about safety. Steve Joyce, an agent with the Walsh & Parker Insurance Agency in Hudson, Mass., who works with many residential builders, offers some general advice on how you can run a safer company and help control your insurance costs:

- The basic rate companies pay for workers' comp is set on an industry-wide basis within your state. For a carpenter in Massachusetts, Joyce explains, the current rate is about $11 per hundred dollars of payroll. That figure is multiplied by an individual-experience-modification factor, or "mod," assigned to each individual company. Your mod depends on the number of accidents you've had in the preceding three-year period, and ranges from .7 or so to about 1.9. The effect of the mod means that a company at the bottom of the range might pay as little as $7.70 per hundred dollars of payroll for a carpenter, while one at the top would pay nearly $20. Many states impose an additional penalty based on the severity of reported injuries.

- Your mod is adjusted annually, but it's based on performance over the preceding three years. Joyce notes that a lot of builders "sort of give up" after a serious claim, in the belief that they'll be paying more for insurance forever. That's not the case. You will pay more the following year and for two years after that, but if you don't have any additional claims, your rates should go down the fourth year.

- If you've had a claim this year, there are no two ways about it: Your rates will be going up next year (they may be going up anyway, of course, but that's another story). Joyce points out that it's essential to get a straight answer from your insurance agent on how much that increase will be, because that increased overhead has to be factored into any bids you prepare for upcoming work.

- All insurance companies have loss-control people who will help you set up a formal safety program that can make your company a more attractive customer, especially if you've had a recent claim. The bigger the company, the more elaborate a program will be. At a minimum, you will have to designate a safety-program coordinator who reports directly to the owner, hold regular safety meetings, and keep records of meeting attendance and topics covered. Joyce stresses that all this has to be done consistently and conscientiously. "Your underwriter doesn't want to hear talk about how safety conscious you are," he says. "It wants to see actual safety programs in place, starting with the owner on down."

- Don't assume that your company is safe just because you've never had a serious injury. "Some people are just lucky," Joyce says. Implementing a safety program *before* you have an accident may save you money — but, more important, it will help protect your employees.

while longer and then left the room to consult with someone. When he came back, he told me it was worse than he'd initially thought. He said that if I wanted any chance of saving the eye, I'd have to get myself to a hospital in Boston, and left me to choose one.

After I picked a hospital, he gave me some eye drops, and told me to douse the eye every five minutes and to try not to move my eyes. I was so worried by this time that I don't think I even moved my head the entire 100 miles to Boston. When I arrived at the hospital, I was immediately prepped and taken into surgery. I was bedridden there for a week with an antibiotic IV drip and constant applications of eye drops and ointment.

During the operation, the doctors had determined that the lens had been destroyed, and that a lens implant would not be possible. They sent me home with a steel patch over the eye and directions to avoid straining my eye, since that could pop the stitches and cause me to lose it altogether.

As the doctors monitored my recovery and the eye appeared stable, they opted for a series of injections into the eyeball instead of the multiple follow-up surgeries originally expected. The injections apparently settled the concern over eventual, catastrophic retinal tearing or pressure buildup leading to fluid loss.

Eventually, I was fitted with a thick contact lens that

How to Keep Your Eyes

This magazine regularly hears from readers who call, write, or e-mail to complain about photographs that show unsafe work practices. The most common complaint, hands down, has to do with photo subjects who aren't wearing safety glasses while doing work that puts them at risk of eye injury. (For the record, while we try to screen out glaring examples of unsafe work, there's a limit to what we can do. Because *JLC* relies on actual job-site photos, rather than staged or studio shots, it shows the world of residential construction as it is, not the way it should be.)

Why are so many builders careless about protecting their eyes? We've all heard (and maybe offered) the standard excuses for going without safety glasses: They're goofy looking. They get lost. They scratch. They break. They collect dust or fog up. They're uncomfortable.

Feel free to add your own favorite reason to the list. But remember: Things look very different when seen with one eye than they do with two. Here are a few pointers on choosing and using eye protection:

- Modern safety glasses are available in a wide range of styles, some of which are indistinguishable from expensive sport glasses. Many nonprescription versions are available for $10 or less. Select ANSI-approved glasses that carry the inscription "287" or "287.1" on the inside of the frame.

- To provide good visibility in everything from bright sun to subdued indoor light, it's a good idea to have several pairs of glasses available, with both clear and tinted lenses.

- Ordinary prescription glasses are better than no eye protection at all. But they're much less impact-resistant than true safety glasses, which are tough enough to stop most pneumatic nailer misfires and other high-speed projectiles.

- If you wear glasses, consider investing in a pair of prescription safety glasses. The cost is comparable to that of ordinary glasses, and, except for the removable side shields, they're similar in appearance.

- The best place to store safety glasses is on your face. Choose eye protection that you can wear comfortably all day, and you won't have to waste time looking for your glasses when you need them.

had a nipple on the end to help pull the eye back into a spherical shape. However, the lens was such a nuisance — it made my eye water constantly and acted as an irritating sawdust magnet — that I soon decided I'd rather do without most of the vision in the eye than put up with the annoyance and frustration of dealing with the contact lens.

Although I'm thankful that I've kept the eye, I have very little vision on the left side. I can see light or darkness, but not much else — something like looking through a completely out-of-focus camera lens.

Mine was a weird accident, but probably half the guys you talk to have had a table saw kick material back in their face and hit them all around the eye zone. I just happened to score a bull's-eye. At work, today, I always wear safety glasses.

Dave Handren *is co-owner of Handren Bros. Building in Harwich, Mass.*