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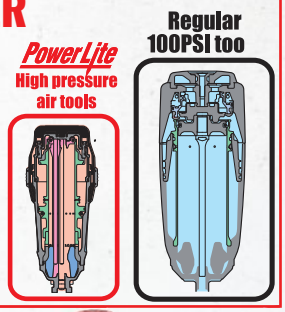

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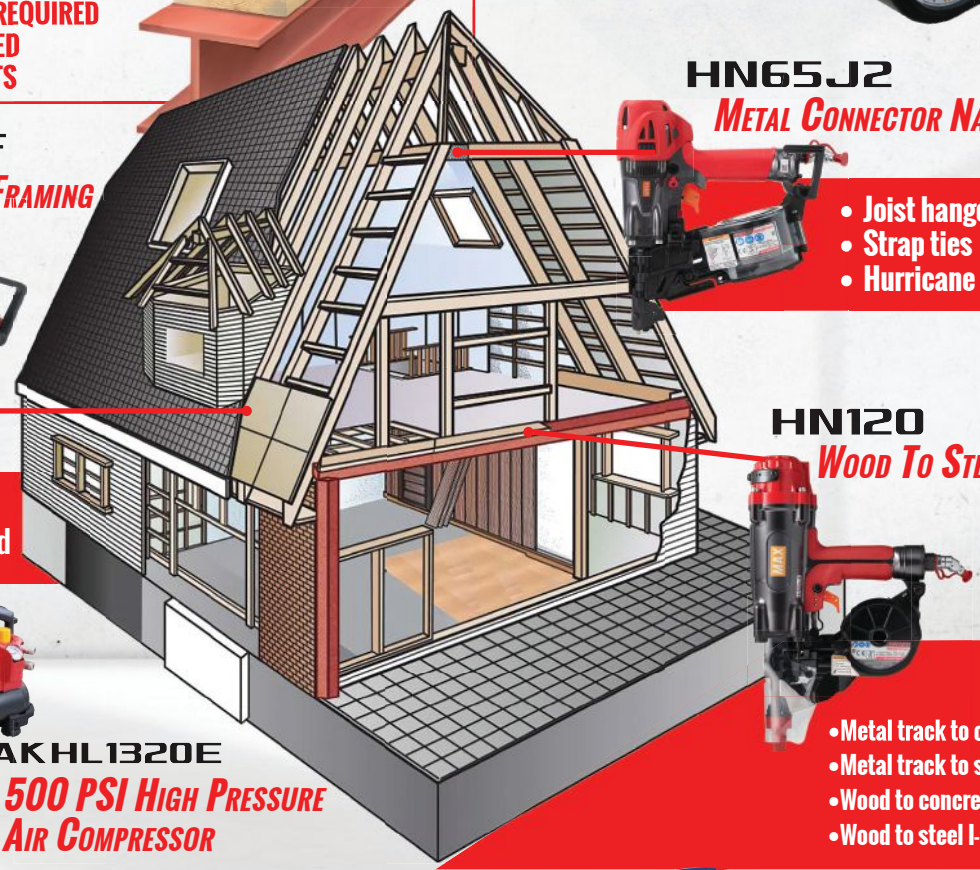

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ON THE COVER: Emanuel Silva cuts a large timber while repairing the rotted ends of basement columns.
Photo by Emanuel Silva. See the story on page 37.

PHOTOS: TOP, NATHAN CLARK; BOTTOM, MARK PARLEE

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Clayton DeKorne, Chief Editor, JLC Group, cdekorne@zondahome.com
Charlie Wardell, Managing Editor, cwardell@zondahome.com
Josie Masterson-Glen, Production Editor, jmastersonglen@zondahome.com
Marc Forget, Associate Editor, mforget@zondahome.com
Vincent Salandro, Editor, Products, vsalandro@zondahome.com

Alice Ashe, Art Director, aashe@zondahome.com

Contributing Editors: Jake Bruton, Mark Clement, Rob Corbo, Ted Cushman, Tim Healey, Dave Holbrook, Doug Horgan, Jake Lewandowski, Roe Osborn, Emanuel Silva, Gary Striegler, Nicole Tysvaer, Tim Uhler, Andrew Wormer

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EDITORIAL AND ADVERTISING OFFICES

4000 MacArthur Blvd., Suite 400
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866.846.0282

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Steve Van Kirk, 480.277.5422, svankirk@zondahome.com
Cathy Whelan, 708.466.6083, cwhelan@zondahome.com

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kbillado@zondahome.com

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Working In The Heat

BY MARC FORGET

Our author is looking stylish, ready for the beach or the worksite.

PHOTO BY MARC FORGET

Summer is here! Whether you live with heat all year or just get to have it for a few months, knowing how to manage the conditions around you is vital to staying safe. In my article "Working in Winter" (1/26), I talked about how we cannot control the weather we work in, but we can control how we prepare for it. In my region, summer temps can get into the 30s Celsius (high 90s Fahrenheit) with the added joy of elevated humidity. Yes, the 100-degree temperature swing from winter is fun. So, knowledge about what that kind of heat can do to a person who is doing physical labor is important to have.

What I want to go over in this article are the different physical results of heat and sun exposure and how to treat them or mitigate them. I also want to talk about clothing choices, work practices, and hydration. While many of you may know the first aid portions of this, I recommend spreading that knowledge to your whole crew. If the one person who has all the first aid skills is the one who needs the help it's going to be a bad day.

How the Body Reacts To Heat

The human core body temperature is around 98.6 degrees F. That can vary slightly between individuals but in general that is where your body wants to be. When you start to get warmer than that, either from physical activity, the ambient temperature, or a combination of the two, your body will try to cool itself down in the following ways. You will start sweating and the evaporation of the moisture on your skin will release heat. Your heart rate will also increase, which helps pull heat from your core to the extremities. Connected to that, your blood vessels will dilate, resulting in increased blood flow. This, in turn, helps release heat by radiating it away from the core and aids in the sweating and evaporation process.

This all works well so long as nothing impedes the process, and so long as the exposure is not for long. The things that can get in the way of this are: high humidity that reduces the effect of sweating; restrictive clothing that constricts blood vessels and traps heat (creating a feedback loop where you keep getting hotter); and being poorly hydrated (if you don't have enough fluids then your body can't produce the sweat to cool you). In addition, poor cardiovascular health will make that increased heart rate difficult to maintain.

First, Get Out of Your Body's Way

As a baseline, you need to wear loose, light-colored clothing and not too much of it. You want moisture to be pulled away from the skin without becoming trapped in the fabric. Quick-dry synthetic fabrics are good for this, and so are linens. You want light colors so that the sun's radiation reflects away from you. Again, you also want clothes to be loose enough to move with you so they don't constrict blood flow and can allow air to pass over your skin.

You also need to drink in order to sweat, and to consume the right types of drinks. To prevent dehydration, an average male needs 13 cups of liquid a day and a female 9 cups (according to The Institute of Medicine, which is the health arm of the National Academy of Sciences). If you are sweating and physically active, then you will need to drink more. Water is the easiest, but fruit juice and sports drinks can be part of that mix. (Energy drinks with high levels of caffeine and sugar are not recommended. High concentrations of caffeine stimulate urine production, and high sugar concentrations draw water from the body's tissues. The effect of both increases dehydration.) The salts and other minerals in juice and sports drinks help replenish what you lose throughout the day. If you are thirsty, then you are already 1% to 2% dehydrated. If coffee and energy drinks are part of your extra fluid intake, then try to add a hydrating drink instead of a dehydrating one.

In terms of exposure time to heat, you need to listen to your body and take cool-down breaks. Watch your pace on hot days, doing heavier work in the cooler morning and reducing the heavy stuff as the temperature rises. Your body can't cool down if it's creating heat through activity.

For cardio health you need to think

Heat Index Table

Actual Thermometer Reading (Degrees F)									
	70	75	80	85	90	95	100	105	110
Relative Humidity %	**Apparent Temperature (Degrees F)**								
0%	64	69	73	78	83	87	91	95	99
10%	65	70	75	80	85	90	95	100	105
20%	66	72	77	82	87	93	99	105	112
30%	67	73	78	84	90	96	104	113	123
40%	68	74	79	86	93	101	110	123	137
50%	69	75	81	88	96	107	120	135	150
60%	70	76	82	90	100	114	132	149	
70%	70	77	85	93	106	124	144		
80%	71	78	86	97	113	136			
90%	71	79	88	102	122				
100%	72	80	91	108					

KEY

Above 130°F = heatstroke imminent

105°F to 130°F = heat exhaustion and heat cramps likely; heatstroke with long exposure and activity

90°F to 105°F = heat exhaustion and heat cramps with long exposure and activity

80°F to 90°F = fatigue during exposure and activity

Source: National Weather Service

about your fitness. The less in shape you are, the more difficult it is for your body to cope with the stress of heat. There are some other no-brainers too, such as limiting time directly in the sun, increasing airflow around you, wearing a wide-brimmed hat, not drinking alcoholic beverages, and using sunscreen.

When That Fails...

Even if you or your coworkers have done everything right, the heat and sun can be too much. There are a few symptoms of heat and sun exposure that need to be watched for and actively treated. These include cramps, swelling, rashes, burns, and even life-threatening heatstroke. Starting with some of the less harmful ones and working our way up, let's look at these symptoms and their treatments. Keep in mind that even a relatively minor affliction can escalate if not paid attention to and treated—for instance, experiencing cramps or dizziness while on a ladder can be dangerous.

The following first aid advice is taken from St. John Ambulance's "First Aid Reference Guide" (4th edition, 2019) and the "Wilderness First Aid Field Guide" (6th edition, 2022) by the Emergency Care and Safety Institute. This information should always be checked against the latest information available and with medical professionals.

Heat Edema

Good old swollen ankles and feet can happen to most people from standing all day, especially in the heat. And it can be common early in the heat season when your body is not yet acclimatized. Edema can get uncomfortable if it persists. Elevating the legs and even wearing support stockings can help.

Heat Rash

Here you have an itchy red rash on the skin, usually caused by all the sweating you are doing. If the weather is humid, then the chances of this rise significantly. Often the rash appears around the neck or on the insides of the legs, and it doesn't become painful if treated early. To prevent heat rash, try to stay dry. I know that's not easy to do, but wearing wicking clothing (quick-dry synthetics, not cotton) and changing your clothing will help. The treatment is to get the area to dry and allow it to breathe and cool down. If the rash persists, then topical creams could be called for.

Heat Cramps

This usually presents as painful cramping in the abdomen or back of the legs. This can start as muscle spasms and then progress to a full clenching of the area. It also may occur long after the heat exposure or physical activity. The cause of this is the depletion of electrolytes in the body, so prevention means keeping your levels up on hot days—and on average workdays as well. The treatment is stretching, resting in a cool area, and hydrating. Fluids with minerals, such as sports drinks and fruit juices, may help. Salt tablets are not recommended (see "A Note on Salt Tablets" below) but a ratio of ¼ teaspoon of salt to one quart of water is a standard first aid treatment to replenish sodium in the body. This should be consumed in small sips to reduce the chance of nausea or vomiting. Even with this strategy, cramps can last a few hours before subsiding. If the cramping does not subside, seek medical help.

A Note on Salt Tablets

According to the first aid books referenced above, as well as the Mayo Clinic and Johns Hopkins Medicine, salt tablets are best administered by medical

professionals. The reasoning is that you are adding a highly concentrated dose of salts and other minerals to the body. This high dose can be dangerous if not accompanied by enough fluids. If care is not taken, you could be doing more harm than good.

Heat Syncope

This one usually is seen as a precursor to heat exhaustion or heatstroke but can be a stand-alone condition. Here the person will feel dizzy and may even have a fainting spell. This often happens right after physical exertion or heavy heat exposure. If you or one of your coworkers start to feel this way, get to a safe place quickly. I once had a coworker say they were feeling odd just before turning away from me and dropping like a stone. They had just helped lift a beam. If they had been in mid lift or at a height when they fainted, then the result would have been more than a bloody nose.

If someone has fainted, check for breathing and injuries, and escalate to getting medical care if they have trouble regaining consciousness. When they awaken, help them rest with their feet elevated, cool down with water, and if not nauseated get them hydrated as you would with heat cramps. (This strategy also applies to someone who is dizzy but hasn't yet fainted.)

Sunburn

While this seems less severe than fainting, I (and others) consider it serious due to what can result over time. I know a roofer and a siding/window installer who both had parts of ears and noses removed due to skin cancer. According to their doctors this was a direct result of years of having unprotected skin exposed to the sun. As with most conditions, prevention is the best course of action. A sunburn is a radiant burn caused by the sun's rays. As a burn, it has classifications similar to any other burn: first, second, and third degrees. Usually, the sunburns we see are red and swollen skin with some blisters—these fall in the first-degree or pushing-second-degree level.

The prevention is to keep exposure time down, cover as much of your skin as possible, and apply regular applications of sunscreen (once in the morning won't do). The treatment is to cool the area with a damp cloth, which reduces the heat and soothes the pain, and to gently apply an ointment once the skin has dried. Do not break any blisters—this can cause infection and scarring—but instead let the area heal over time. Try to be extra diligent in covering the area as it heals so that you don't do further damage. During and just after healing the skin is very sensitive to heat and the sun's rays. If vomiting, nausea, or dizziness starts, then you are getting into our next condition.

Heat Exhaustion and Heatstroke

Heat exhaustion and heatstroke (sometimes called sunstroke) are terms frequently used interchangeably. However, they are different. Heatstroke is the more dangerous, life-threatening condition, and will often evolve from untreated heat exhaustion.

These conditions result from dehydration, physical exertion, and heat exposure, which cause blood circulation to pull away from the major organs and to pool in the blood vessels close to the skin. With heat exhaustion, the symptoms are: excessive sweating, thirst, fatigue, nausea, headache, rapid pulse, and shortness of breath. It often feels like having a flu. If you or a coworker get to this stage, it needs to be taken seriously and treated immediately. You need to get the person to a cool place and keep their head and shoulders elevated with their knees bent. Remove any extra clothing. Give the person fluids if they can take them, but give them small sips to reduce the chance of vomiting. As noted above, salted water (¼ teaspoon to one quart of water) can be administered, also in small sips.

The person should not be left alone, or should be checked on frequently. They may seem stable, but symptoms could progress to fainting and/or vomiting, which can be dangerous. Recovery can take quite some time, so their workday is done at this point and they need to rest and slowly hydrate.

With heatstroke you will see the previous symptoms, but the person's mental state will be altered. Look for confusion, unresponsiveness (blank stare), or agitation. The skin also will feel very hot but not usually wet like with heat exhaustion. Here, treatment is the same, but a call to get medical attention should be made.

More on Mitigation

We plan for site conditions, material requirements, and workflows, but weather conditions also need to be planned for. Some of the simple things my partners and I did included saving work in the cooler areas of the home (basement and first floor) for the hottest days. The third-floor trim would be worked on first thing in the morning or not at all on the hottest days. We started earlier or took a long break in the middle of day, rejoining the work in the evening. We made sure to have water and sports drinks onsite every day and created a schedule for it to be replenished. Taking a cool-down break was normalized—no judgment if you needed a minute. We also benefited from a sun shelter tent with a mist fan that was a standard setup for the crew who did our foundations.

I asked other *JLC* contributors what they do to help beat the heat and what follows are their replies.

▸ John Carroll, *Builder, Durham, N.C.*

I spent the first 10 years of my career working on roofs, mostly in North Carolina. So, I definitely developed strategies for working in the heat.

Work as much as possible away from the sun. If you're working on the side of a house, for instance, don't get hung up on finishing that side before starting on another side. Instead, stop when the sun is beating down on that side and move to another side. Oftentimes, you can't get completely out of the sun on

a roof but you can go to a side where the sun's rays hit at a more oblique angle. The south and east sides of a roof, for example, are brutally hot in the morning, but that ameliorates a bit in the afternoon when the sun is beating down on the west side. A rule of thumb for roofers or siders is to avoid working with the sun on your back. Schedule your day to avoid the heat. On extremely hot days, I've arrived at daybreak and quit at 11:00 a.m. Sometimes, it pays to take a long break at midday, then return to work late in the afternoon. The afternoon is the time to work on the east and south sides. Drink plenty of water. Then drink some more. Water is essential. An old roofer's trick is to rub some of that ice water on your wrists, too. It's surprising how much it cools you down.

▸ **Mark Clement, *Deck Builder and Remodeler, Ambler, Pa.***

I start with wearing a good wide-brimmed hat. You need to keep the sun off your head and face as much as possible. Even the hard hat I wear allows airflow and this goes a long way in keeping my head cool. I keep a change of shirts with me and when one gets soaked through I change it. I also spray myself down with a hose in between shirt changes.

I will set up a fan that blows across the deck I am building and another one just at my feet under my cut station. In a back yard with vinyl siding on two sides and a composite deck, the reflective heat is oppressive, so a bit of a breeze goes a long way.

▸ **Jake Bruton, *Owner, Aarow Building, Columbia, Mo.***

At my company we have a few ways to help our crews get through the summer months. On each of our work trailers we carry a pop-up tent for shade. This one took a while to become standard practice, but once one of our younger guys started putting it up the older crew members saw the value and made it a regular thing. We also carry box fans that the crews can set up on site. That

John freezes a pot of water and puts the block into his cooler for the day. A solid piece of ice like this lasts much longer than a few ice cubes.

can either be outside to give them a breeze or blowing up from the basement inside a home. In either case, it helps.

One of the bigger things we do is have air conditioning units mounted on landscape trailers. We put these on site and run temporary ductwork into the home (see photo). Since our homes are usually weathertight with ZIP sheathing, we can get the temperature in the house down from say the mid to high 90s to around 80 degrees F. This makes a big difference to our crews and helps bring in subs. When we can tell our subtrades that they will be working on an air-conditioned site they will generally prioritize our jobs. This has worked out well in keeping our jobs on time even during the hottest periods.

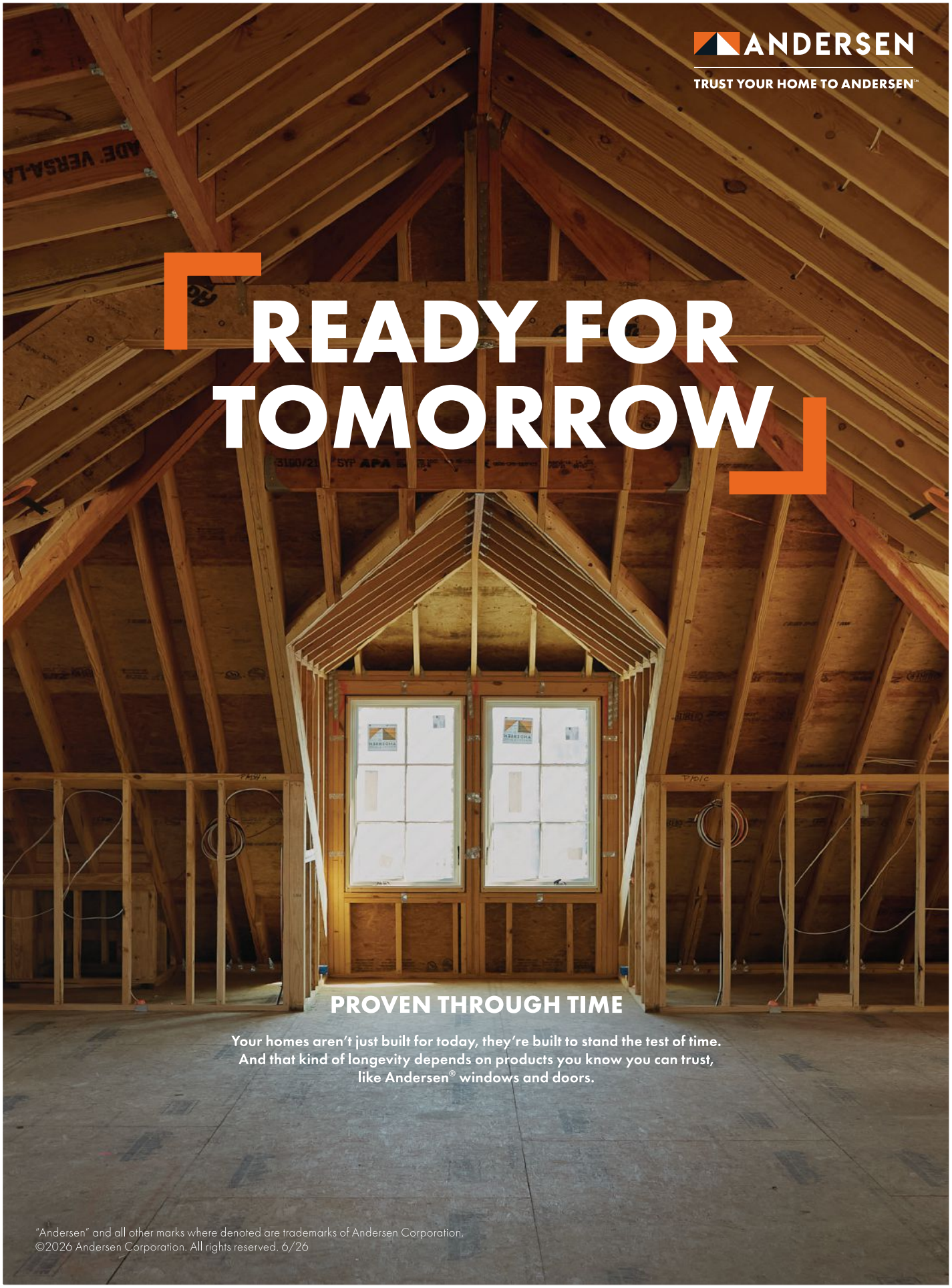
Common Sense

Most of what keeps us safe at work is straightforward, but I sometimes pushed the precautions aside when on a tight deadline. That is when, sometimes, bad things happen. The "sometimes" part is what makes us complacent. If you got a sunburn every time you walked outside without sunscreen you wouldn't forget to slather up. Since you don't feel the consequence every time, you start to think it does not apply to you. Take the time to think out your workdays when facing the summer heat. There's no special badge for working on the hottest day of the year.

Marc Forget is an associate editor at JLC, a licensed carpenter, and has standard first aid training from St. John Ambulance and Advanced Wilderness First Aid through Canadian Wilderness Medical Training.

Jake's onsite AC not only improves conditions for the crew but also helps productivity.

PHOTOS BY JOHN CARROLL, JAKE BRUTON



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Q&A

Q When anchor bolts are out of stock at our local lumberyard, we frequently use lengths of threaded rod that we've cut and bent ourselves. A new foundation subcontractor recently said this is not permissible by code. Is he right?

A *Mac Hampson, a multi-trade building inspector in Wilmington, N.C., and author of* Behind the Walls, *responds:* The foundation contractor is correct. Anchor bolts at the sill plate are not just "something to hold the wall down." They are designed structural links in the load path that connect the wood framing to the foundation and help the building resist wind and uplift forces.

Using plain, full-thread rods bent into an L- or J-shape as "anchor bolts" may feel like a practical field solution, but it often steps outside what the prescriptive residential requirements and the underlying structural design assumptions are based on.

For typical residential construction, prescriptive requirements and most engineered details assume anchors with known, established behavior. Typically, the design assumes:

- Recognized anchor bolts sized and spaced per the approved plans and applicable prescriptive tables (or as specified by the engineer of record);
- Conventional hooked or headed anchor configurations, or listed anchor systems, that have been tested for tension and shear;
- A continuous load path from roof to walls to sill/plates to foundation that is based on known anchor performance in concrete.

ADOBE STOCK

The key point is that the connection must be predictable, which is not the case with a site-bent full-thread rod. There is no verified hook geometry or bend radius tied to tested performance for that rod or bend configuration. There is no evaluation report or manufacturer data supporting "bent all-thread" as a cast-in anchorage method. As a result, the anchor performance assumed by prescriptive provisions or an engineer's design may no longer match what is installed in the concrete.

Even before you get to the concrete, a threaded rod is not the same as a purpose-made anchor bolt: The effective steel area is reduced at the thread roots, and field bending adds variability. On the concrete side, anchorage behavior and failure modes are addressed through ACI 318, an American Concrete Institute framework that's referenced by the residential code for structural concrete where prescriptive provisions stop. That framework is built around standardized anchor types and tested assumptions—not improvised, site-bent rod details.

As with most structural details, if the anchor detail is not shown on the approved plans and is not a recognized prescriptive solution, the burden shifts to documentation. In practice, that means the installer should be able to provide either an Engineer of Record approval (a sealed detail or written acceptance tied to the specific condition), or a listed anchorage system with a supporting evaluation report and manufacturer installation requirements that match what is installed in the field.

If neither exists, the safest and most defensible path is to pause the work, document the condition, and involve the design professional or manufacturer before proceeding.

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Q I've never been comfortable sweating copper supply lines (I'm a remodeler, not a plumber). Given the steep cost, does it make sense to invest in a press tool? Are any other remodelers running these tools, and if so, what should I know about them?

A *Jeremy Kassel, owner/operator of Kassel Construction in Glenmont, N.Y., a remodeler of 22 years, and a frequent presenter at JLC Live answers.*

The cost upfront was a concern for me also when I bought mine back in 2018. I had rented the tool a couple of times and decided that the utility of it made it worth purchasing. Renting a tool has a cost not just in the rental charge but also in the time needed to get and then return it. I waited for an upcoming sale at my local supply store and pulled the trigger. The $1,800 still stung though.

A quick description for those who aren't familiar with the tool: A press tool hydraulically compresses a ring within specialized fittings onto the pipe. The jaws of the tool are first lined up over the part of the fitting that contains the rubber compression ring. When the tool is activated, the jaws close completely around the ring and squeeze it until the tool reaches its maximum pressure. The tool then releases, resulting in a secure leak-proof joint that requires less time and skill than threading or soldering. Fittings match common pipe connections, such as shutoffs, elbows, and conversion joints.

There are manual versions of the tool but the one I got was the Milwaukee cordless Force Logic. It works both with brand-name fittings (like ProPress) and the generic press fittings that you see at the box stores. There are also different-sized press jaws that can be switched out on the tool to let you work on various pipe diameters. The tool is most often used to get a fitting onto copper pipes but can be used on other materials, such as black iron, stainless steel, and PEX.

A press tool has a high upfront cost but earns its place.

ADOBE STOCK

I haven't regretted the outlay of money: The tool has helped me speed up work and allows me to do things that would have been difficult without it. I am not a plumber, but in my area contractors can do plumbing work if they schedule a plumbing inspection with the city. Of course, you should check what the regulations are in your jurisdiction. Having used these press fittings for a few years now I have not had any failures or issues come up with the work I've done.

The advantages for me have been, first off, no fire. Not having to solder with an open flame in old homes, often in tight spaces, is huge. I am okay at soldering, but it is not something I do every day, whereas pressing a leak-proof fitting on a pipe does not take much practice.

The speed with which the fittings can be installed helps me work efficiently, but the biggest plus is I can get an end cap or shutoff valve installed even if the pipe still has water in it. Often, closing the old main water shutoff would still allow a trickle of water through. Or, I wouldn't be able to get the system to drain well enough and there would still be water, preventing me from soldering a fitting on. Not having to worry about completely drained pipes saved me many times and let the work proceed quickly.

In the homes I work on, we are usually connecting to original copper and then switching to a plastic tubing like PEX (for cost reasons). The flexibility of being able to choose materials is great. I have also ended up using the tool for boiler pipes: They are often the hardest to get all the water out of, but now I can isolate the area temporarily with a shutoff valve and move on with the work and reconnect later.

I think of my purchase of this tool in the same way I view the purchase of a metal brake (or any capital investment for that matter). You can buck up and spend the $1,800 to $2,800, or you can keep renting or going to a metal fabrication shop to get parts made. But once you have the tool, you can be more flexible with the work you take on. You just have to decide if this is a tool that you need, regardless of the cost. In my case, I've recouped the big upfront cost by expanding the type of work I'm able to do.

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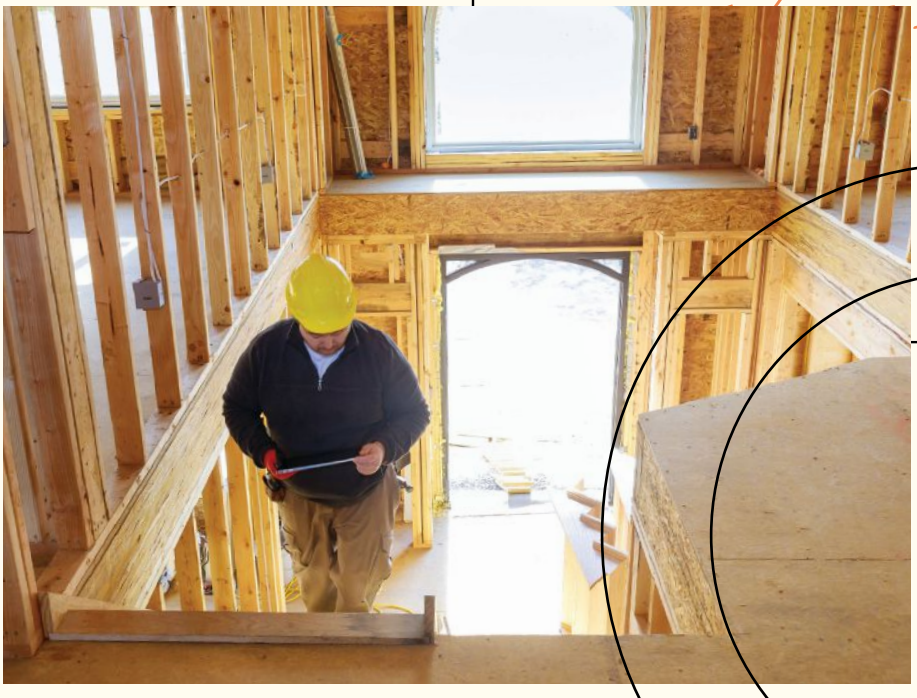
The Journal of Light Construction



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Zonda™ Media

A Custom Walnut Vanity

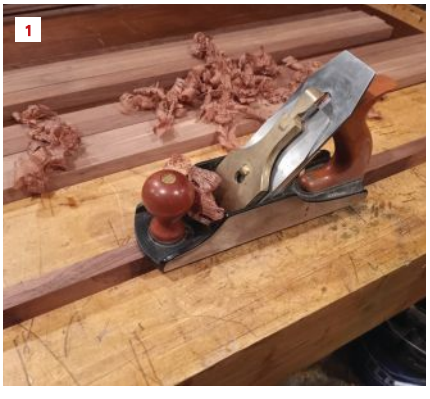
by **NATHAN CLARK**

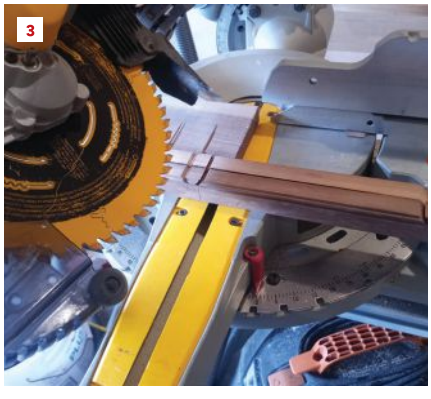
Every good built-in should feel as though it has always belonged in the room. That was the aim with this custom vanity: to create a new piece that matched the existing walnut bathroom cabinets in both material and character.

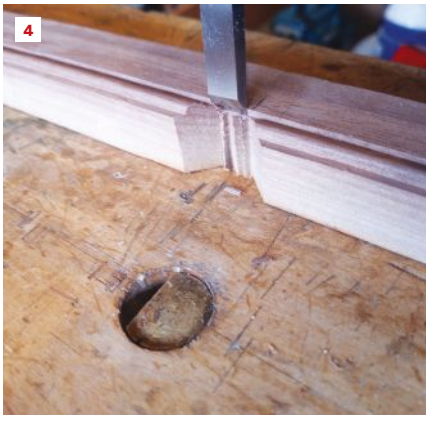
Crafting the Face Frame

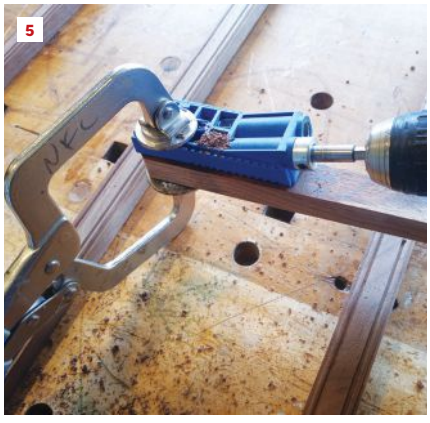
The build began with the face frame, milled from walnut into narrow strips measuring 1 inch wide by ¾ inch thick. A quick pass with a hand plane removed the saw marks and left the pieces cleaner **(1)**. Because the existing cabinets use beaded face frames, the new vanity needed the same detail to feel fully integrated. At the router table, featherboards held the stock firmly against the fence and table, making it possible to cut the beads consistently **(2)**.

The rails—the horizontal members of the face frame—required extra attention, especially those dividing the drawer openings. The bead detail had to turn the corners without interruption, so the joinery called for jack miters, also known as haunched miters, to carry the profile cleanly through each transition.

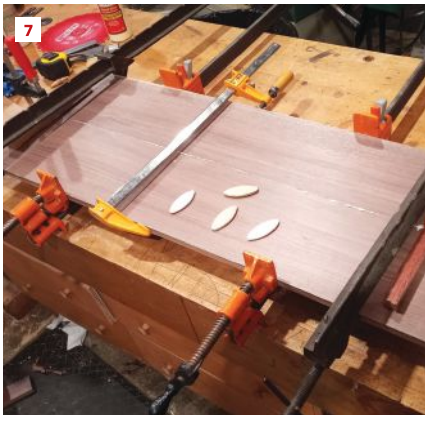








PHOTOS BY NATHAN CLARK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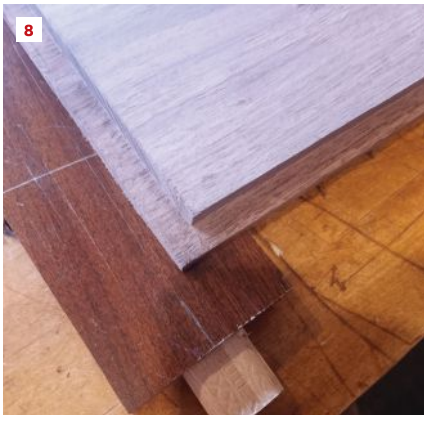
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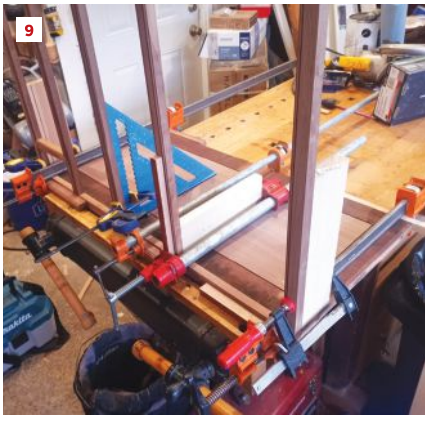
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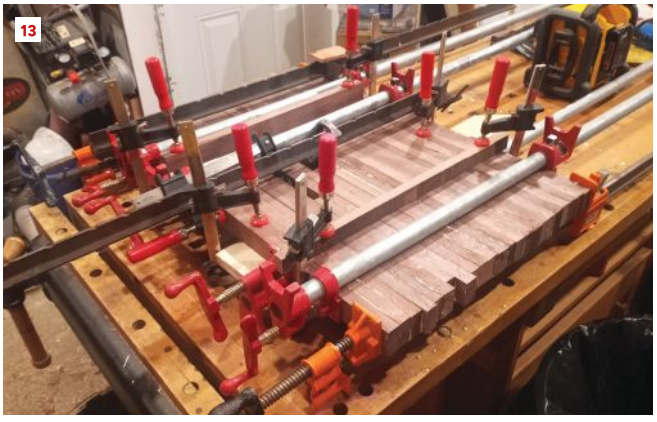
After careful setup at the compound miter saw, the haunches were cut into the stiles with the help of a spacer block set for precise depth **(3)**. The remaining waste was pared away with a sharp chisel **(4)**, and the rails were then cut one at a time to match. Once everything was dry-fitted and aligned, the frame was assembled with pocket screws and reinforced with wood glue **(5, 6)**. The result is a face frame that looks delicate but is robust in construction, made more satisfying by the fact that the walnut was salvaged from a discarded dining-table top.

Building the Carcass

One side of the cabinet was built as a traditional frame-and-panel assembly. The panel began as a rough-sawn board too wide for the thickness planer, so it was ripped in half, planed, and then glued back together using biscuits for alignment **(7)**. Grooves were plowed into the stiles, and the panel was rabbeted on the back so it could sit neatly in place while preserving its full ½-inch thickness—important, since that material would later support the drawer-slide hardware.

To connect the frame-and-panel side to the face frame, loose mortise-and-tenon joinery cut with a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domino machine provided both strength and alignment **(8)**.

Matching mortises in the back of the face frame and the cabinet side allowed the parts to register cleanly during glue-up. Clamping blocks across the rails kept the assembly square under pressure **(9)**. The opposite side, destined to sit against a wall, was built from plywood to save cost where appearance would not matter **(10)**. With the back and bottom attached using pocket screws and glue, the carcass came together ready for drawers, sanding, and finish **(11, 12)**.

Shaping the Countertop

The countertop started as a glue-up of ¾-inch flatsawn walnut strips, milled and joined into a slab **(13, 14, 15)**.

Shorter pieces were placed around the sink area, intentionally leaving gaps where the cutout would later be made. After the glue cured, the surface was flattened with a coarse-grit belt sander, then machine-sanded through 150 grit before being cut to rough length with a circular saw. The exposed edge was refined with a miter plane, while the sink opening was cut with a jigsaw and the faucet hole drilled with a spade bit **(16, 17)**.

A hand plane cleaned up the front edge, and a router softened the front and left edges with a roundover profile. Final hand-sanding with the grain to 220 grit prepared the slab for finish.

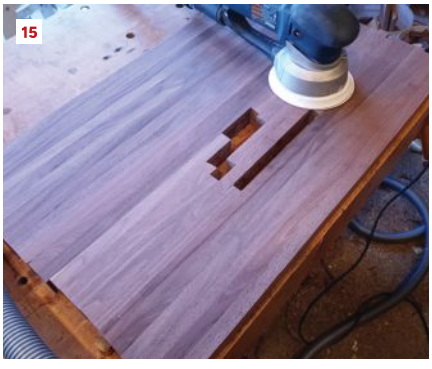
Finishing for a Wet Environment

For a vanity that would live in close contact with water, durability mattered as much as appearance. The chosen finish was a two-part conversion varnish, for toughness and resistance to moisture **(18, 19)**.

Spraying the finish ensured an even coat across both the cabinet and the countertop while allowing the work to move efficiently through multiple applications. A minimum of three coats would build the protection needed for everyday use.

Installation and Final Fit

Installation began with the cabinet itself, which was leveled and fastened to the wall studs using shims and screws **(20)**. From there, attention shifted to the countertop, left with an overhang of about ⅞ inch at the front and side. To achieve a tight fit to the walls, the slab was scribed in place—blue tape made the knife lines easier to see—then trimmed with a circular saw and fine-tuned with a hand plane **(21)**. The countertop was secured from below with screws driven through corner blocks, along with a bead of silicone for added holding power and moisture protection. The backsplash was scribed and glued to the wall with silicone, with an additional bead at its base to create a waterproof joint. Then the final storage details were begun: large oak drawer boxes cut with a dovetail jig and smaller cherry drawers joined with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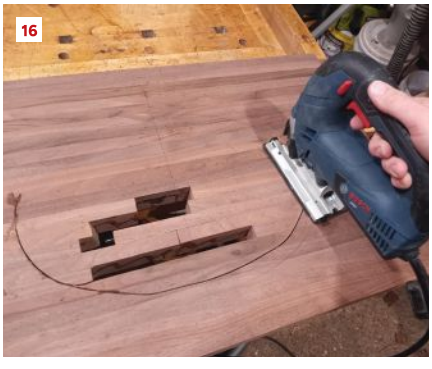
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hand-cut dovetails **(22)**. The larger drawers were shaped around the plumbing lines and drain to make the most of the available space **(23).** Copper sink basins, an oil-rubbed bronze faucet, and matching copper pulls completed the piece, along with a finish that felt both functional and refined **(24)**.

Nathan Clark is a carpenter and remodeler in Ithaca, N.Y.


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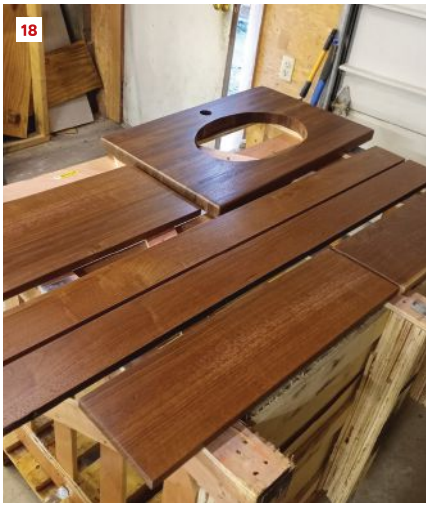
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Copper Corner Terminations: Where Performance and Design Converge

by **TREVOR KURZ**

On the surface, this may look like a story about a single exterior corner detail but it's actually much more. No effective detail is just slapped on: It needs to serve both a functional and aesthetic purpose and to be integrated into the overall design of the building. Even the seemingly simplest of details can have a deeper backstory, and that's certainly the case here.

This is really a story about design thinking. It's also a story about how to work with, rather than against, the inherent properties of building materials. My hope is that it provides readers with a framework for thinking through challenging details and developing durable solutions that serve both aesthetics and performance.

Design Challenge

I have always had an affinity for classic New England architecture. For that reason, when my company was commissioned to design and build a modern guest house, I saw it as both an opportunity to step outside my design comfort zone and learn something new in the process.

The project involved an existing client who had purchased a large waterfront parcel on Cape Cod with a rundown antique home that they intended to restore as the primary residence. Their directive for the guest house was clear: They wanted a deliberate visual juxtaposition between old and new. The guest house was not meant to mimic the main house, but rather to stand apart from it while still feeling intentional and grounded.

That design brief opened the door to exploring materials and details I had not previously relied on, particularly at the exterior.

Our design process always begins with what I refer to as a client wish list. In my experience, most clients have spent considerable time thinking about their project before we ever meet. Some arrive with a simple spreadsheet. Others provide links to highly curated Pinterest boards. In this case, it was the latter.

A theme emerged almost immediately. The exterior siding was going to be clear, vertical-grain, red cedar shiplap installed horizontally with a nickel gap reveal. The clients even directed me to a local address where they had first seen the look and encouraged me to view it in person.

When I arrived, the material itself looked great. What stood out, however, were the outside corners. Every mitered corner had opened up. Visually, it was distracting. Functionally, it raised red flags. Trying to hide those openings with corner boards would have defeated the intent of the detail altogether.

My initial design for this project included numerous outside corners created by massing, roof overhangs, and exterior columns. There was no avoiding them. My woodworking instincts initially kicked in and I began thinking through ways to stabilize the miters: splines, biscuits, dominoes, or some variation thereof. I also knew I did not want to rely on sealants as the primary line of defense. Sealants will eventually fail.

The author devised two different corner treatments using copper flashing that he has since used on a number of exteriors—an open square corner (1) and a single fin (2).

PHOTOS BY TREVOR KURZ

Wood moves. In our local climate, it moves a lot. No matter how clever the joinery, the odds are high that the miters will eventually open.

The breakthrough came in an unlikely moment: One morning, while brushing my teeth, I found myself looking down at the floor tile I had installed at home. At the doorway, a Schluter-Systems aluminum transition bridged the gap between marble tile and white oak flooring. It was doing exactly what it was designed to do: managing movement, protecting edges, and clearly separating two materials.

Just as importantly, it looked good.

That was the aha moment. The transition was not trying to hide the joint. It made the joint intentional.

Design Solution

I began searching for a comparable product that could serve a similar purpose at exterior siding corners. That search came up empty.

The next call was to our sheet metal fabricator. That conversation marked the beginning of developing a series of copper corner treatments that would address the functional shortcomings of mitered wood corners while also contributing positively to the building's overall aesthetic. What started as a durability problem quickly evolved into a design opportunity.

With the decision made to abandon mitered outside corners, it was important that everything occurring beneath the siding supported the same goals of durability, drying potential, and predictability.

The wall assembly itself was relatively standard. Half-inch CDX sheathing was wrapped with Typar housewrap, installed per manufacturer specifications and fully integrated with window and door flashings. In lieu of traditional tar paper splines at inside and outside corners, we used 12-inch-wide self-adhered-membrane splines, providing 6 inches of protection in each direction.

Over the WRB, we installed a cedar breather to create a dedicated drainage and drying space behind the siding. This was not optional. When using wood siding, particularly in a coastal New England climate, the ability for the assembly to breathe and dry is as important as its ability to shed water.

The siding material was 1x8 clear vertical-grain red cedar, installed horizontally. Vertical grain was selected intentionally due to its dimensional stability and more uniform weathering pattern over time. That predictability matters, especially at termination points. As a brief side note, red cedar is chemically aggressive. It contains tannins and organic acids that can accelerate corrosion. Combined with the project's proximity to salt water, this led us to default to stainless-steel fasteners throughout.

Copper (Beyond Aesthetics)

Copper was chosen for its functional characteristics, not just to serve as an accent. It is durable, easily formed, readily soldered, and performs well in exterior environments. Just as importantly, it ages honestly. Over time, it develops a patina that reveals exposure to the elements rather than disguising it. In both modern and traditional contexts, copper has a long track record of compatibility with wood construction.

The goal was not to introduce contrast for contrast's sake, but to select a material that could handle exposure, movement, and time better than wood alone at the most vulnerable points of the assembly. That said, and to be candid, the combination of wood and metal also produced a clean, compelling visual result.

Because the copper pieces were custom bent, their dimensions were flexible. I settled on a ⅛-inch projection beyond the finished wall surface. With the cedar measuring approximately 11/16 inch thick and the breather adding an additional ¼ inch, the total copper projection from the wall sheathing ended up at roughly 1 1/16 inches.

One unavoidable consequence of this approach is that siding boards terminate with square cuts and a ⅛-inch gap at the copper rather than wrapping continuously around the corner. That condition places the end grain of each board at the termination plane, which must be addressed deliberately.

Prior to installation, all cut ends of siding boards that would terminate at copper were treated with an oil-based end-grain sealer. Products of this type are designed to penetrate exposed end grain, slowing moisture absorption and reducing the likelihood of checking or splitting over time. This step does not prevent wood movement, nor is it intended to. Its purpose is simply to improve durability at the most vulnerable surface of the board.

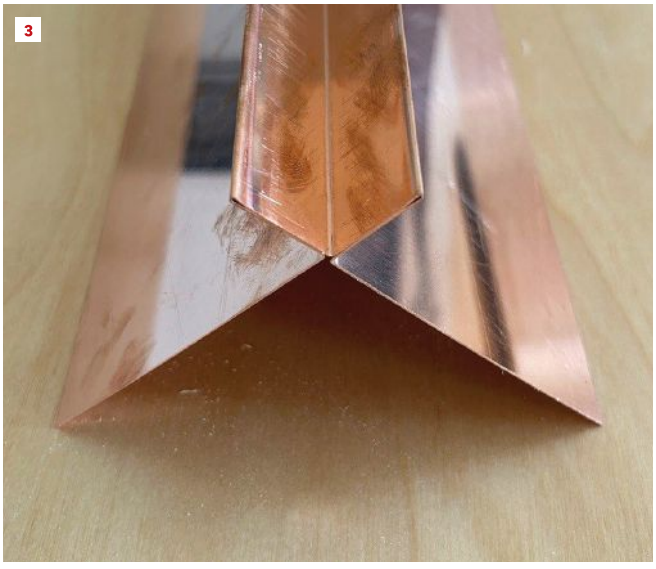
The copper is not there to hide or cover something. Its job is to provide a crisp, stable termination point while allowing each siding board to move independently. The end-grain treatment helps protect the freshly cut cedar, while the copper eliminates the need to force two wood edges together in a condition that would almost certainly open over time.

Because wood is more susceptible to movement across its width, the ⅛-inch gap at the wood-to-copper transition tends to remain visually uniform as the siding expands and contracts. Instead of trying to maintain a fragile miter, each board simply dies into a consistent reveal.

That division of labor is what makes the detail work. The cedar is free to move. The copper stays put. And the corner continues to read as intentional rather than problematic.

Fabricating the Trim

I have limited experience working with sheet metal, so my first thought regarding the copper profile was relatively simple. I envisioned an L-shaped corner modeled loosely after the Schluter Jolly trim referenced earlier. The idea



Samples bent by the fabricator show the profiles of the two corner treatments the author uses—the open square **(3)** and the single fin **(4)**.

was straightforward: a clean 90-degree metal edge that would provide a durable termination while remaining visually minimal.

That concept was quickly vetoed only a few minutes into the first in-person meeting with our fabricator.

After I explained what I was attempting to accomplish, he stopped me mid-sentence, walked over to the brake, and quickly bent up two mockups. The first was a 45-degree fin. The second was a more substantial 90-degree profile with defined returns and a slight projection. Seeing those pieces in hand immediately shifted the conversation from whether the idea would work to which profile looked best and made the most sense architecturally.

We ultimately selected the 90-degree detail for the horizontal shiplap siding on this particular project. It created a crisp shadow line and a strong termination point without visually overpowering the façade. More importantly, that meeting made it clear that we were not developing a single copper corner. We were developing a family of options.

Once you stop trying to force a wood miter and instead begin thinking of the corner as a formed metal transition, the possibilities open up quickly. Depth, projection, reveal, shadow line, and profile geometry can all be adjusted. The same basic concept can be tuned to feel at home on a stark modern elevation or a much more traditional exterior. The only real limitation is what can be bent on a brake and the creativity of the person operating it.

The 45-degree fin, for example, has since been used as a termination detail for cedar shakes. Rather than weaving outside corners, which frequently open, split, or telegraph movement over time, the shakes die cleanly into a single vertical copper fin. It gives the corner a sharp, intentional look while preserving the overall traditional character of the siding.

What began as a solution to a durability problem has evolved into a flexible system. Whether used with horizontal shiplap, vertical siding, or cedar shakes, each variation follows the same basic principle: Give the wood a clean place to stop, allow it to move independently, and let the copper turn a problem area into a visual feature.

Once the profile dimensions were finalized, our fabricator bent each copper section in manageable 10-foot lengths that could be dry-fit and assembled onsite. This proved important because dimensions may work on paper, but field conditions are rarely as exact as the drawings suggest. In areas where the overall run exceeded 10 feet, we also had 2-inch joining inserts fabricated. These were designed to slip inside the profile and create a clean, concealed solder joint after installation.

Installation

Each copper termination was installed directly over the WRB and corner membrane splines before siding began. Cedar Breather followed completion of the copper installation. In effect, the copper established a permanent control line for every outside corner before the first siding board ever went on.

That sequencing made the siding install far more predictable. Each board was simply cut to length, the end grain treated, and the board run to a consistent ⅛-inch reveal using a temporary shim that was removed after fastening. Instead of trying to maintain a fragile wood miter while simultaneously climbing the wall course by course, every cut terminated against an already established reference point.

Instead of the usual decorative trim pieces that are applied after the siding is installed, these treatments are integrated into the siding during installation. These detail photos of the open square corner treatments (5, 6) demonstrate how they are installed.

At corner transitions, the individual copper pieces were mitered. On long vertical runs, adjoining sections were butted together over the concealed joining inserts. Everything was then soldered after final fit-up.

Waiting until the end to solder was intentional. Minor field adjustments are inevitable, and pre-soldered sections would have made those adjustments difficult without damaging seams or distorting profiles. By dry-fitting first and soldering last, we were able to keep all lines straight, all joints tight, and all transitions clean.

Once soldered, the copper ceased to be a collection of separate trim pieces and became one continuous skin wrapping the vulnerable corner conditions.

That distinction is important. These are not decorative copper covers applied after the siding is complete. They are integrated metal terminations installed as part of the siding system itself.

No exterior detail remains frozen in time, and this one is no exception. The cedar will continue to move seasonally, the copper will darken and eventually patina, and the visual relationship between the two materials will mature with exposure.

What should not happen, however, is the progressive visual unraveling that is common to mitered wood corners. There are no fragile wood points meeting at a knife edge, no sealant joints serving as structural insurance, and no attempt to force continuity where continuity does not naturally want to exist.

Instead, the siding boards remain independent of one another while the copper remains dimensionally stable. The gap line stays consistent, the corner stays crisp, and any aging that occurs tends to read as honest weathering rather than failure.

That distinction is significant. Homeowners generally accept materials aging. What they do not accept is materials appearing to come apart.

Like many custom details, this one is not intended for every project. It requires coordination, custom fabrication, and a willingness on the part of both builder and client to allow the corner condition to be expressed rather than hidden.

Where it makes the most sense is on projects where exterior material quality is already a priority. Modern homes are an obvious fit because the detail aligns naturally with clean lines and intentional transitions. That said, as the cedar shake fin variation has shown, the same logic can be adapted successfully to more traditional architecture as well.

In short, this approach works best where durability matters, craftsmanship is visible, and the exterior design benefits from a termination detail that looks deliberate rather than compromised.

As builders, we often spend time trying to force materials to do things they do not want to do. Wood is asked not to move. Sealants are asked not to fail. Miters are asked not to open.

Sometimes the better answer is not to fight the material, but to acknowledge its behavior and design accordingly.

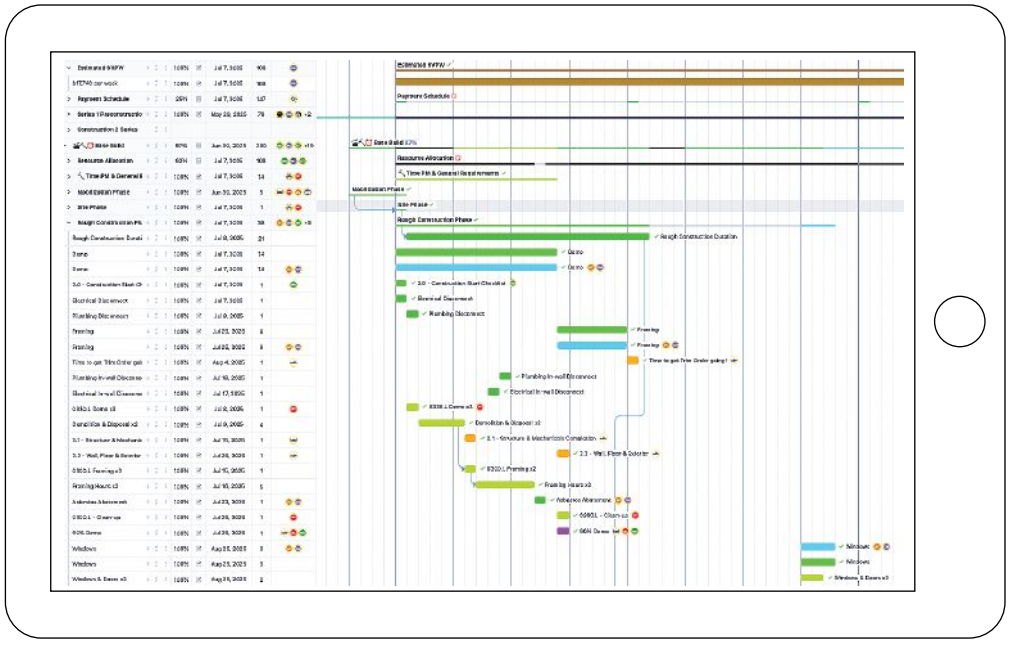
That was the real lesson in this project. By abandoning the idea that the wood corner had to wrap seamlessly, we ended up with a detail that performs better, installs more predictably, and, in my opinion, looks better too.

The best details are often born that way: not from decoration, but from solving a persistent problem honestly enough that the solution becomes part of the architecture.

Trevor Kurz is president of Kurzhaus Designs in Harwich, Mass.

The Schedule Is a Team Sport

by **IAN SCHWANDT**



Layer 1 shows the overall duration of the project. This version is owned by the operations manager.

Most project schedules in residential remodeling are built by one person and handed to everyone else. Typically, the project manager, salesperson, or the owner spends an hour or two building a schedule that reflects the promises they have made to the client. This schedule gets passed along to the lead carpenter who may take it seriously or may never look at it twice. The schedule might get tacked to a wall or it might end up on the floor of the van. In either case, the most likely outcome is that before demo is complete the schedule no longer reflects reality, and everyone quietly agrees to stop pretending it does.

After struggling with this for years from both the field and the office, I now view this as a system failure not a people failure. The schedule isn't wrong because one person built it badly. It's wrong because one person built all of it. Project duration, phase sequencing, and day-by-day task order require three different kinds of knowledge, owned by three different people. When one person tries to carry all of it, the parts they are farthest from are the parts that fail.

At TDS Design Build we close more than 90% of our projects on the schedules that were set during contract negotiations—two to three months before work began. We're not able to do this because we're unusually good at predicting the future. We're able to do it because we've built a scheduling system where each layer of the schedule is owned by the person closest to that layer of the work.

Schedule Layers

I've written previously in *JLC* about Volume Per Week (VPW) and its role in setting project duration based on historical data. In a nutshell, VPW is the average revenue your company produces per week on projects of a given type and size. On a $180,000 remodel with a VPW of $18,000, the expected hammer-swinging duration is 10 weeks. VPW gives you the container for the project. Structuring what goes inside the container—the phases, the trade partner sequencing, the day-by-day task order—is where most scheduling systems break down. That's because they treat all the variables the same.

Think about it in terms of what you actually know at each stage of preconstruction. When I'm setting overall project duration three months before we break ground, I have the contract price, the project type, and a set of drawings. I have no reliable knowl-

edge of how the lead carpenter will sequence the day-to-day work of demo and framing against the mechanical rough-in work—because that depends on trade partner availability, which is unknown. Asking me to build that level of detail at that moment is asking me to invent it, which all but guarantees missed deadlines.

The inverse is also true. On the day the lead carpenter walks onto the site, they have detailed knowledge of what needs to happen today, tomorrow, and next week. What they don't have, and shouldn't need To figure out from scratch, is the overall project duration and the financial consequence of missing it. That ship sailed on the day the project was sold.

The same principle—what I call "the cone of uncertainty" and describe in "A Budget Represents What You Know" on my Substack (and elsewhere)—affects the budget. A budget built before design is complete carries more uncertainty than one built after. Not because the earlier budget is worse, but because less is known. You match the precision of your estimate to the precision of your information. Scheduling works the same way.

At TDS, we've built our scheduling system around this principle. Each layer of the schedule is owned by the person whose knowledge matches that layer's required precision. There are four layers, four owners, and a clear sequence for when each layer gets built.

The Four Layers

Layer 1: Overall Duration
(Owned by the Operations Manager)

The first question any schedule has to answer is the simplest: How long will this take? At TDS, that question belongs to me, and I answer it with VPW.

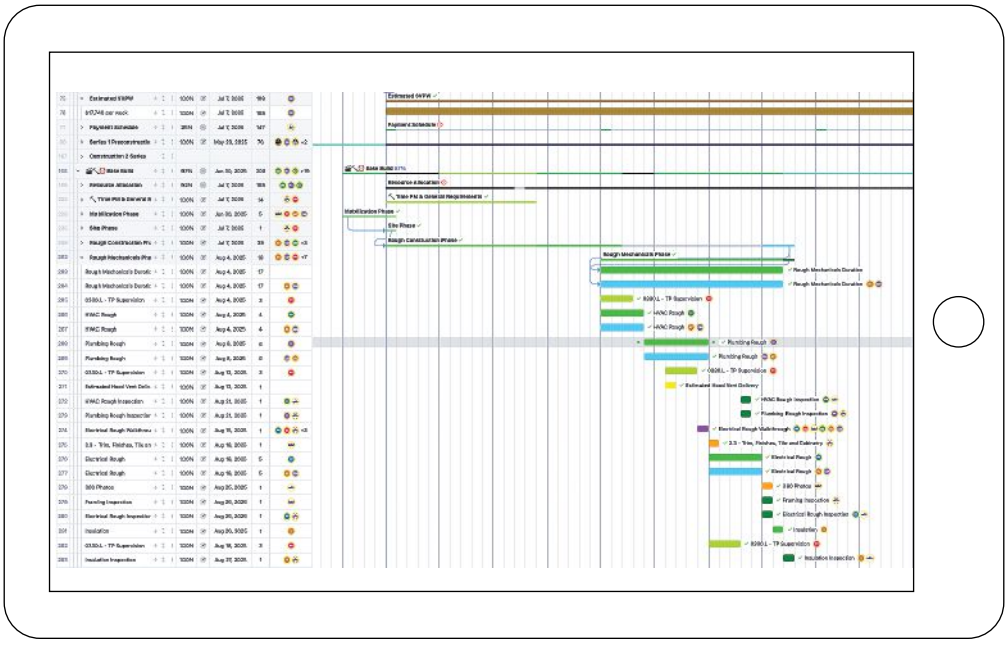
Once the project has a contract price, I use our historical VPW data, tracked across 60-plus completed projects, grouped by type and revenue range, to set the hammer-swinging duration.

For a $180,000 kitchen and bath remodel with a VPW of $18,000, the duration is 10 weeks. That number anchors everything that follows. It also feeds directly into our pricing: As I've written before, duration and gross profit are inseparable, and a project that runs two weeks long without a corresponding change order has already given up a meaningful slice of its gross profit.

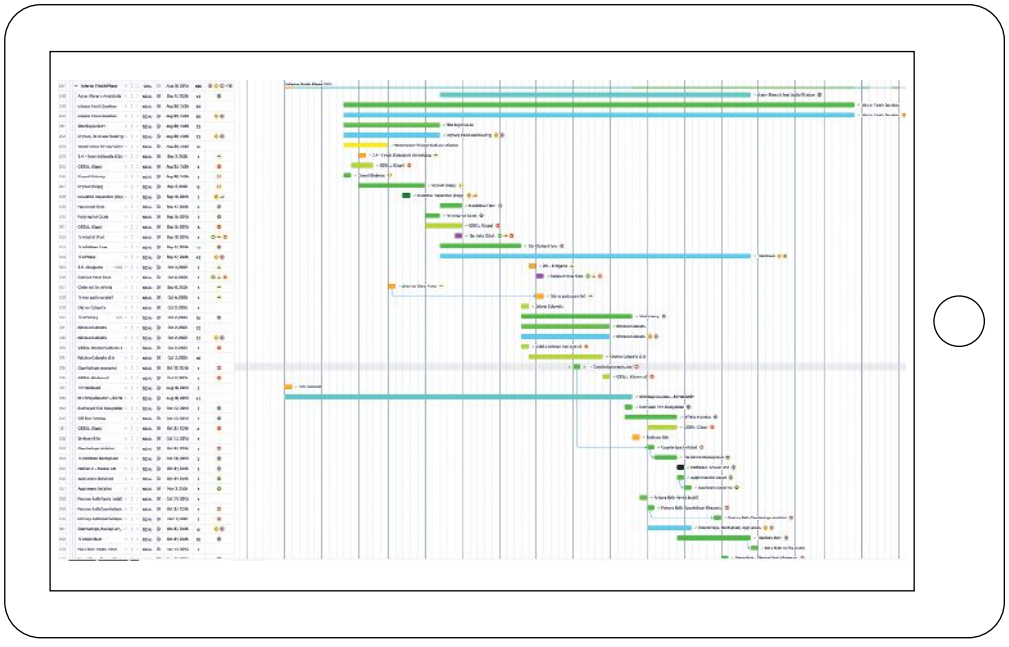
Leadership-level ownership of this layer isn't just about having the historical data. It's about having the financial context to understand what the duration means. A lead carpenter who sets overall duration without understanding the gross profit consequence of an overrun is being asked to make a financial decision they are not equipped to make.

Layer 2: Phase Duration
(Owned by the Build Coordinator)

Once overall duration is set, our build coordinator, Phil, uses the Phase Cost Summary from our estimating spreadsheet to break the single duration bar into phases. The Phase Cost Summary allocates cost codes across the project's construction phases—Mobilization, Site, Rough Construction,



Layer 2 is owned by the build coordinator, who uses the Phase Cost Summary from the author's estimating spreadsheet to break the single duration bar into phases.



Layer 3 of the schedule is built by the project manager to define which tasks are performed by the author's company and which tasks belong to subcontractors.

Rough Mechanicals, Exterior Finishes, Interior Finish, and Completion—and applies our VPW data to calculate the expected duration of each phase. Phil will introduce buffers based on his perception of how the construction phases may run in parallel.

Phil owns this layer because he lives in the intersection of procurement, cost data, and schedule structure. He knows what a Rough Mechanicals phase costs on projects like this one, and he knows how that cost translates to weeks of production given our trade partner capacity. I don't carry that level of phase-specific detail in my head, and the lead carpenter shouldn't have to build it from the drawings alone.

The output of this layer is a high-level Gantt chart in JobTread: one bar per phase, sized to the expected duration, arranged in the sequence the project will run. It's not a finished schedule. It's the skeleton on which the next two layers will hang.

Layer 3: Self-Perform vs. Trade Partners (Owned by the Project Manager)

The project manager, Kevin, takes Phil's phase framework and refines it into a second layer of detail: which work TDS is self-performing and which work belongs to trade partners. This distinction matters enormously for scheduling because the two types of work have fundamentally different scheduling constraints.

Self-perform work—our demo, framing, and interior finish carpentry—is scheduled around our own crew's capacity, which Kevin manages directly. Trade partner work—mechanical rough-ins, drywall, tile—is scheduled around the trade partners' availability, lead times, and sequencing requirements, which Kevin has developed through the preconstruction buyout process. Kevin further refines Phil's buffers and introduces additional buffers within the phases.

By the time Kevin hands the schedule to the lead carpenter, the project has a phase structure and a clear map of who is responsible for each scope of work. What's still missing is the day-to-day detail of how the self-perform work unfolds onsite. That's the one piece Kevin can't build with confidence, because he won't be on the site.

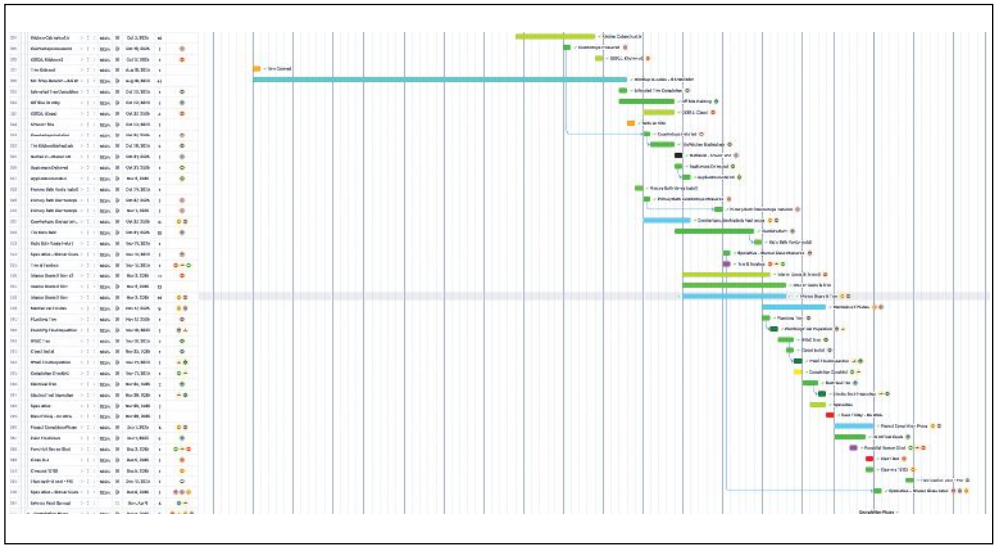
Layer 4: Boots on the Ground (Owned by the Lead Carpenter)

The lead carpenter builds the final layer: a day-by-day task sequence for the self-perform work, fitted inside the phase containers Kevin established. This is the schedule the crew runs.

Two things are true about this layer that make lead-carpenter ownership essential. First, the lead carpenter has site knowledge that no one else has—they've walked the job, they know the access constraints, they've talked to the trade partners about sequencing preferences. Second, the lead carpenter is the person who will be held accountable if the day-to-day work doesn't stay on track. Accountability requires ownership. A lead carpenter executing someone else's day-to-day schedule is a lead carpenter who can always blame the schedule. A lead carpenter who built the day-to-day schedule has full accountability for their outcomes.

Impact on Finances

The scheduling system isn't just an operational convenience. It's a financial instrument, and understanding why requires one more metric.



Layer 4 is built by the lead carpenter to keep track of work performed by the author's company.

In my previous *JLC* articles on GP/Day, I wrote that every project needs to be evaluated not just by gross profit percentage, but by how much gross profit it delivers per day of duration. A $180,000 kitchen at 30% gross profit generates roughly $770 in gross profit per day across its 10-week run. That number isn't arbitrary. It's the daily contribution the project must make to keep the company's financial engine running.

When a project runs long, that number tells you exactly what the overrun costs. Two unplanned weeks on that $180,000 project—10 additional working days at $770 per day—is roughly $7,700 in gross profit that was never in the budget to lose. No change order was written. No client conversation was had. The money simply didn't arrive because the project didn't finish when it was supposed to (which also tied up resources that should have been used on another project).

This is why the accountability stack matters beyond the organizational logic. When the lead carpenter owns the day-by-day layer, a slipping task sequence is visible to the person who can act on it immediately. When the project manager owns the trade partner layer, a subcontractor scheduling conflict surfaces during buyout, not during rough mechanicals. When the build coordinator owns the phase layer, a phase that's budgeted too thin shows up in preconstruction, not five weeks from completion.

The system pushes problems upstream, toward cheaper solutions. A schedule problem caught in preconstruction costs a conversation. The same problem caught in week seven costs margin.

Where This Comes From

My team and I did not invent the principles behind this system. The idea that scheduling precision should be matched to the knowledge of the person building it has roots in Takt Planning and Pull Planning techniques used by large commercial contractors—methods that have been slow to migrate into residential remodeling, partly because they require a team structure sophisticated enough to distribute the ownership.

That's the prerequisite most residential companies skip. The system only works if the roles are real. A build coordinator who doesn't live inside the cost data can't own the phase layer. A project manager who hasn't done the preconstruction buyout can't own the trade partner layer. A lead carpenter who hasn't walked the site and been onboarded to the project can't own the day-by-day layer. The scheduling system reflects your team's actual depth. It is not a substitute for it.

What we've found is that when the roles are right, the schedule takes care of itself. Each person builds the layer they can see clearly, and the layers connect. Inevitably, when something breaks, it breaks visibly and early enough to respond to—rather than silently and in a costly manner.

That's the difference between a schedule that ends up on the floor of the van and one that closes 90% of your projects on time.

Ian Schwandt is the operations manager at TDS Design Build in Madison, Wis., and the author of Nails to Numbers *(nailstonumbers.substack.com).*

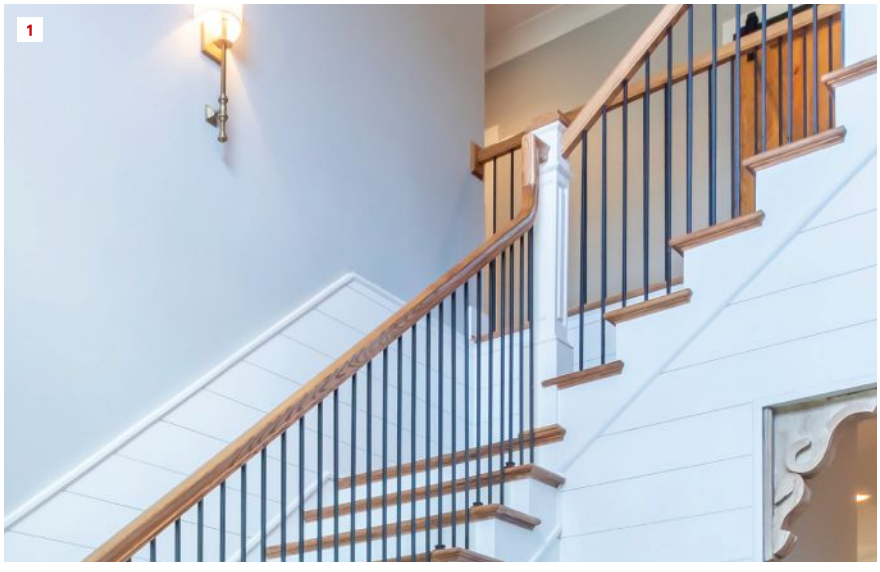
Unstacking Risers for an Elegant Handrail

by **BRIAN CAMPBELL**

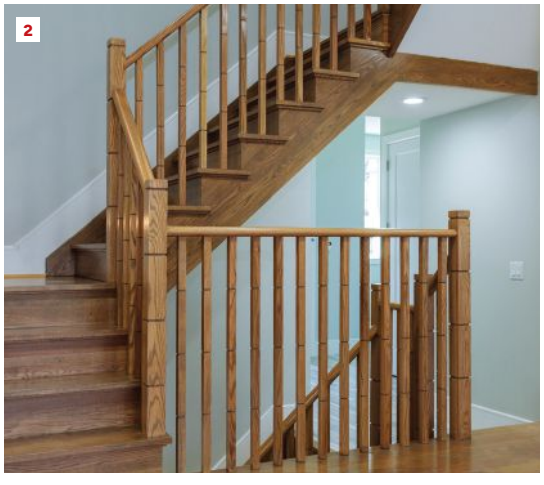
I'm about to embark on an exciting build of a "dancing winder" staircase this summer, which I'll document in a *JLC* article to come later this year. Before we get to that complex winding stair, however, I thought I'd begin easing into the topic of winding stairs with a discussion of the simplest design—a basic "quarter-turn," or L-shaped, stairway with two half-flights of stairs, a lower one leading up to a landing, where it turns the corner and starts the upper half-flight.

A typical quarter-turn stair has a square landing. There's nothing wrong with this landing shape but it complicates the handrail. To understand why, let's first focus on the inside corner of the landing as shown in the illustration on the next page: You have a riser from the top tread on the lower half-flight of stairs coming up to the landing, and from the landing you have another riser to the first tread in the upper half-flight of stairs. These two risers meet at the inside corner of the landing where they are essentially stacked on top of each other. This can be seen plainly in the Stretch-out View.

A Stretch-out drawing is the world's simplest 3D model that old-time stair builders used to work out stair problems. The drawing consists of two elevations of each half-flight combined as one elevation. If you folded the drawing along the line of the landing newel to create a right angle, you would have a rough approximation of the quarter-turn stair. Flattening it out allows you to see not only the run of the stringers, but also the run of the handrail, and in the case of the square landing, the two stacked risers at the inside corner are immediately apparent.

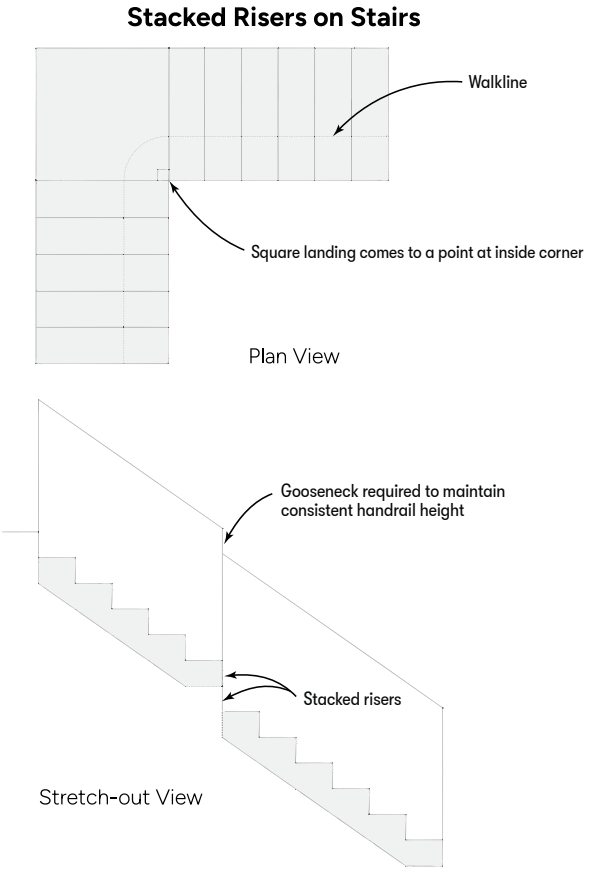


At the corner of a square landing below the handrail on a quarter-turn stair, the two risers (one below the landing newel and one to the right of it) are stacked on top of each other. To maintain a consistent handrail height, the stair builder added a gooseneck to bring the handrail to a consistent elevation **(1)**.

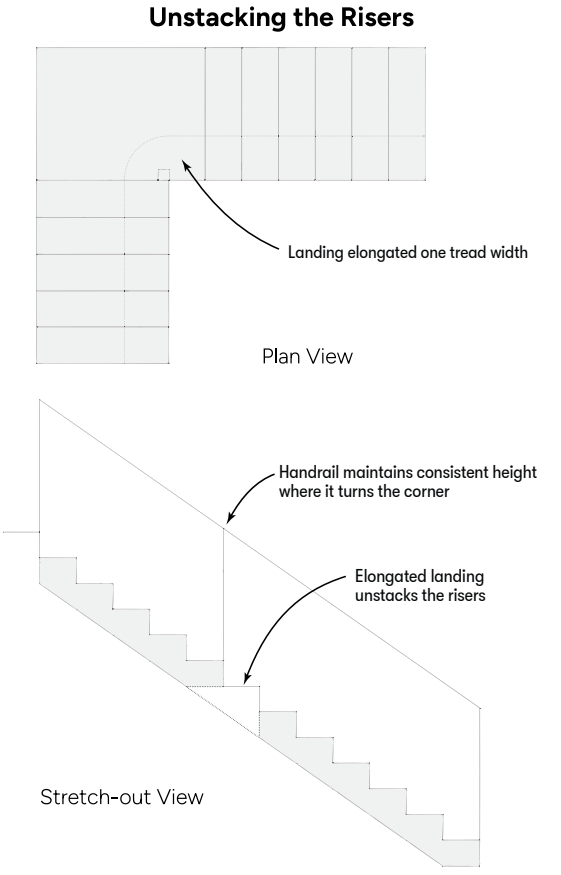


Instead of a gooseneck, the handrails for the upper and lower half-flights of a stair can die into the landing newel at different heights **(2, 3)**.

PHOTOS: ADOBE STOCK



A Plan View (at top) and Stretch-out View (above) of a typical quarter-turn stair with a square landing. Notice that where the stairs turn, the landing comes to a point. In the Stretch-out View, it's easy to see that this results in two risers stacked on top of each other.



The Plan View (at top) and Stretch-out View (above) of a quarter-turn stair with an elongated landing. Extending the landing one tread depth allows the handrail to maintain a consistent height where the handrail turns the corner.

ILLUSTRATION: OLA KWIATKOWSKA

In essence, a square landing is a big tread that comes to a point on the inside below the handrail. If it were a winder tread, code would not allow it to come to a point. There would be too little surface for walking safely near the handrail where most people walk. (Most people tend to take the shortest path.) But because it's a "landing," it's allowed by code. In fact, more falls happen on stairs with landings than on stairs without landings. However, because the fall is shorter down the half-flight, falls from landings tend to be less serious than falls down full flights of stairs.

The square landing also creates other problems. Notice the line of the handrail on the stretch-out drawing of the stair with a square landing. If you want to maintain a consistent handrail height, the lower portion has to ease up into a gooseneck that runs vertically at the newel, so it can hit the newel at the same height where the upper handrail jumps off of it. At least three separate handrail pieces are required for this detail.

Alternatively, the upper and lower handrails can die into the landing newel at different heights. This requires either a wide square landing newel or an elongated block high on a turned newel; both are common because it's easier than assembling a gooseneck.

But there is an easier and much more elegant way to accomplish this: If you extend the landing by one tread depth (by eliminating that corner below the handrail), as shown on the second stretch-put drawing above, the line of the handrail becomes a single line. It turns the corner but you don't need to change elevation; rather, it maintains a smooth, consistent line.

The drawback, of course, is that

the elongated landing does take a little more space: The landing and lower half-flight must shift one tread depth over at the first floor, so it won't work in all cases. But if addressed at the design phase it's often easy to implement, and the result is a vastly simplified handrail that only has to make the turn but does not need to change elevation.

If space is limited, there are ways to build a smaller landing and maintain the simpler handrail. One of my favorite examples of this is the stairs designed by Thomas Jefferson at the Rotunda at the University of Virginia (shown in Photos 5 and 6).

This stair uses a pie-shaped landing and a few skewed treads above and below the landing. Because of the curve it presents itself like a circular stair, but in essence it's a quarter-turn stair. Instead of a square landing that comes to a point on the inside of the turn, Jefferson elongated the landing to match the tread depth below the handrail, so it successfully unstacked the risers and achieved that smooth, single-line handrail.

Code allows irregular-shaped landings (not a square or rectangle) as long as they are at least as big as the area of a circle with a 36-inch radius (about 4,072 square inches) and as long as the walkline (12 inches from the guardrail where most people walk up or down a stair) is at least as long as a quarter-circle with a 12-inch radius (about 19 inches).

With the skewed treads (slightly angled treads above and below the landing), these stairs begin to look like winder stairs, which use wedge-shaped, or triangular, steps called "winders" to change direction instead of a landing.

In the next column, I will dive into more detail on winder stairs and introduce the concept of a French landing, which uses curves in the treads and landings to keep the walkline the same and to achieve a smooth handrail line.

Brian Campbell is a finish carpenter in the Twin Cities of Minn.

This landing **(4)** at the Orange County Regional History Center in Orlando, Fla., has an elongated landing that projects one tread depth beyond the line of the handrail. This unstacks the stacked risers that would otherwise occur if the corner of the landing came to a point directly below the guardrail.

Thomas Jefferson designed this elegant stairway for his Rotunda at the University of Virginia. Rather than coming to a point beneath the handrail, the edge of the oversized, pie-shaped landing below the handrail has the same width as each tread. This unstacks the risers and allows for a smooth handrail at a consistent height above the landing and treads.

PHOTOS: BRIAN CAMPBELL

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The Dangers of Poly Vapor Retarders (and Other Enclosure Ills)

by **MARK PARLEE**

All 28 units like this one **(1)**, which were less than two years old, showed damp areas and small patches of mildew growing on the interior surfaces of exterior walls. On the author's initial walk-through, he scanned walls with a moisture meter **(2)**, which confirmed high moisture levels in the exterior walls.

I was recently called by one of the largest builders in the Midwest to a town home development where mildew growth was appearing in wall corners and near some baseboards along exterior walls. The affected 28 units had been built only about two years ago.

In my initial walk-through with the builder, I scanned the interior drywall surfaces with a Tramex moisture meter, which registered a moisture content (MC) of more than 80% in some places—well above the level where wood starts to decay. Based on these initial findings, we made some exploratory cuts through the drywall where we found water droplets trapped behind the poly vapor retarder.

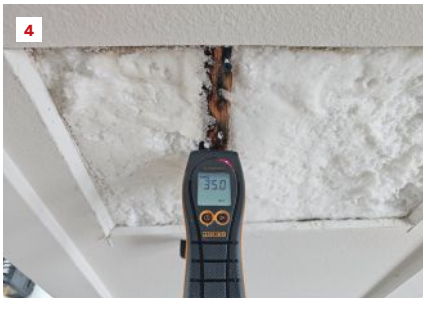
Extensive Problems

Most of the town homes in this development had a combination of brick veneer and metal cladding on the exterior, though some also had manufactured stone. The brick cladding was installed with a generous 1 ½-inch air space between the brick and the OSB sheathing, which had been covered with a Tyvek weather-resistive barrier (WRB). The 2x6 exterior walls had been insulated with blown-in fiberglass, which had been installed behind netting before the vapor retarder was installed.

Further testing with a pin-type moisture meter showed elevated moisture levels on the interior edges of the studs directly behind the vapor retarder. These readings decreased as I measured across the width of the studs, with the highest readings (24% to 42% MC) at the interior edges, and the lowest readings (17% MC or less) just behind the exterior sheathing.

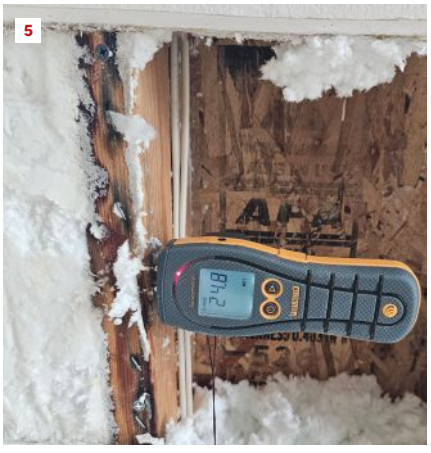
The highest moisture readings (in the 70% to 85% MC range) tended to be at the base of the walls where the water droplets had drained down the poly and soaked the bottom wall plates and floor sheathing.

We found similar results in every unit along the exterior walls except in a few places, such as inside closets, where the vapor retarder had been omitted. In these wall sections there were no signs of elevated moisture; readings were below 16% MC. Any-



Exploratory cuts through the drywall revealed water droplets trapped behind the polyethylene vapor retarder **(3)**. A moisture meter confirmed excessive moisture levels in the framing **(4)**.

PHOTOS: MARK PARLEE



Taking readings across the stud, the author recorded the highest moisture levels along the inside edge **(5)**, with the levels dropping off as he took measurements toward the exterior **(6, 7)**.

With the probe of the moisture meter buried in the floor sheathing beneath the carpet, the author found levels between 70% and 85% MC.

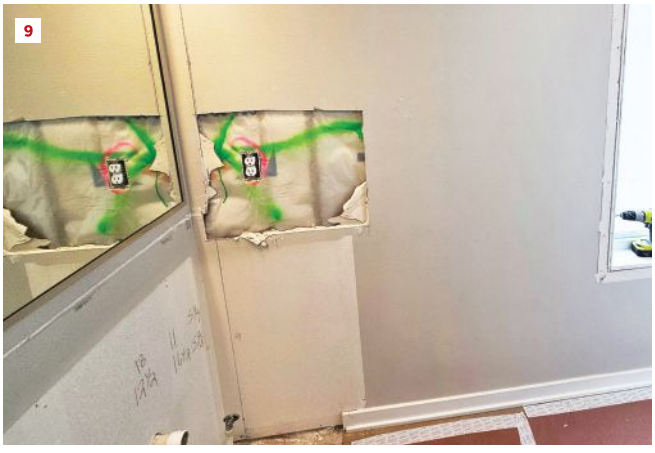
thing below 19% is typically considered "normal" for framing. Dry rot in wood begins at 20% MC; active decay sets in at sustained moisture levels of 30% or higher.

It was increasingly clear that we had an extensive problem on our hands and had to take radical action: The builder called in an insurance restoration company to remove all the drywall along the exterior walls. This meant moving bathroom vanities, as well, to open the walls and begin the drying process with dehumidifiers and HEPA filters. These were occupied units, so all the occupants had to move out. For homes less than two years old this was nothing short of a disaster.

Poly Traps Condensation

I immediately recognized the cause of the water droplets on the vapor retarder as trapped condensation. With brick on the exterior, we have a material that absorbs and holds water (hence the term "reservoir cladding" often gets applied to brick and stone). As this cladding dries, the humidity in the area behind the brick rises. Air leaks as well as solar vapor drive (when the sun dries a wall, the water vapor retreats from the warmer exterior towards the cooler interior) push water vapor through the permeable housewrap and into wall cavities where it condenses on the poly surface that's up against the cool (air-conditioned) interior drywall.

Building codes typically require a Class I vapor retarder (rated at 0.1 perms or less; poly and foil are the most common materials) on the interior face of the exterior walls in climate zones 5 and above. The Chapter 7 provisions of the International Residential Code allow builders in climate zones 5 and above to use a Class III vapor retarder (above 1.0 perm; latex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Based on his initial inspection, the author recommended the radical step of stripping the townhomes of drywall on all exterior walls, so drying with fans and dehumidifiers could begin. This included removing vanities **(9)** and other fixtures in all 28 units. Continued testing with a moisture meter **(10)** confirmed problems on all exterior walls.

paint is typical) on the interior if they use continuous exterior insulation (which did not apply for this development) or have a vented rainscreen. Technically, the space behind brick can qualify as a vented rainscreen but often doesn't. The key word is "vented." These walls were built with weeps at the bottom but without any openings at the top, which would have allowed air to rise by convection and dry the space behind the brick.

Additional Problems

Once all the drywall was removed, we found some wall areas with extensive deterioration of the OSB and framing. The worst areas were caused by brick-tie anchoring screws installed in the sheathing only. When we conducted water tests by hosing down the exterior in select areas, we observed water coming through the fastener penetrations, soaking the sheathing around the fasteners, and draining down and soaking the bottom wall plates where additional damage was evident.

Brick ties must always be located over solid framing, and the fasteners (corrosion-resistant screws or nails at least 2 ½ inches long) must be driven into framing members, not just wall sheathing.

When we removed brick in areas on the exterior to inspect, we also found areas where mortar had spilled onto brick ties. The globs of mortar pressing against the housewrap allowed water to seep through. For this reason, I always recommend installing two WRB layers under brick, just as you would for stucco. Typically, these two layers would be a layer of black paper over a drainable WRB. The black paper acts as a sacrificial layer; water will seep through it where the mortar is directly in contact with it, but the water will drain down the gap created by the drainable WRB instead of soaking the sheathing.

Looking through weep holes, we also identified areas where the Mortairvent (a nylon matrix installed in the air space behind brick veneer that protects the weep holes in the brick from getting clogged with mortar droppings) was installed incorrectly. This allowed mortar to clog the weep holes and prevent water from draining out of the wall as it should.

Remedies

On my recommendation, the builder has opted to remove the fiberglass to


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In some closets, the builder had omitted the vapor barrier. There was no evidence of water in these areas at all.

Deterioration of the OSB sheathing **(12)** was discovered where brick tie fasteners (circled in red) penetrated the sheathing, instead of being driven into framing **(13)**. An infrared image **(14)** highlights moist areas in darker colors where water has run down the wall cavities and started to deteriorate the bottom wall plates.

facilitate drying the walls. After spraying the wall cavities with a mildewcide to inhibit fungal growth, he will replace the fiberglass with 3 inches of closed-cell spray foam, which is an impermeable insulation and doesn't require an interior vapor retarder.

Spray foam is a relatively expensive alternative, but in the face of the failures in this townhome development, it is the best solution as it will help mitigate some of the air leaks through penetrations that are contributing to the moisture problems in this development.

In addition, the metal cladding above some windows will have to be removed to assess and isolate leaks, which we identified during water tests. And brick will have to be removed to correct leaks through misplaced brick tie fasteners.

Going forward, I am recommending the builder comply with the building code by installing a "smart" vapor retarder, such as Certainteed's MemBrain, over his blown-in fiberglass. MemBrain is rated as a Class II vapor retarder under dry conditions (when its permeance is between 0.1 and 1.0 perms). It is made of polyamide (nylon), and its permeability changes based on ambient humidity. When relative humidity rises above 60%, it opens to over 10 perms, functioning as a Class III vapor retarder and allowing moisture to escape.

I am also recommending he install two layers of WRB and install vents (using the same vent covers used for weep holes at the base of the walls) in the brick head joints at the top of the walls. This will facilitate airflow behind the brick and create a true vented rainscreen. He will also have to instruct his production managers to pay closer attention to the masons to ensure the placement of brick ties over the framing and proper installation of the Mortairvent to avoid clogging the weep holes.

Mark Parlee has parlayed his many years as a siding contractor into building-envelope consulting. Learn more about him at thebuildingconsultant.com.

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PHOTOS BY EMANUEL SILVA

Scarfing New Timbers to Old Columns

A solution for replacing rotten basement supports

by **EMANUEL SILVA**

I WAS HIRED TO REPAIR TWO TIMBER columns in the basement of a 200-year-old building in Shirley, Mass., that had once been the post office and had served for a time as a hardware store. The building is currently zoned for mixed use; there's now an insurance company and apartments. The building owner was concerned about two columns supporting the main girder in the basement that showed obvious signs of rot at the base. Both posts were buried in a concrete slab that had been poured over the dirt floor.

While the columns showed evidence of decay at the base, most of the timber above the floor line was sound. These columns were massive timbers from old-growth trees (the building was built in the early 1800s). To me, it didn't make a lot of sense to replace the entire columns. Instead, I chose to join a short section of timber to the base of each column. The new column bases would bear on new, solid footings and be secured by steel connectors that would isolate the timbers from the concrete.

Temporary Support

My first step was to lay down cribbing to spread the load and support house jacks and temporary posts. I stacked the cribbing on the basement slab, in-line with the main girder on each side of each post. For cribbing, I used pressure-treated, Southern pine 4x4s. I screwed five pieces together with a 2x6 on top and leveled them as one with composite shims to keep the jack flat and level. For the temporary supports on the jacks, I used 4x6 stock reinforced with ¾-inch plywood on each side to help stiffen these temporary posts. When supporting building loads, it is critical to keep the posts plumb, so I braced them with horizontal 2x4s that I secured to the upper portion of the columns I was repairing.

I wasn't jacking up the building, just putting pressure on the beam above to take the weight off the old columns. To accomplish this, I chipped out the concrete around each post and dug down through the fill under the slab until I could feel the bottom of each column. Then I started raising each jack little by little, keeping my eye on a laser line trained on the bottom edge of the girder beam to make sure it wasn't moving. Any movement of the beam and floor system might put pressure on the gas and water lines that ran through the floor above, and I certainly did not want to stress those old fittings. As I put pressure on the jacks,

I kept pushing the old columns until I could feel them move slightly, which meant they were no longer carrying the weight of the building.

Once the weight was off, I set to work cutting off the existing columns about 2 feet above the floor, scoring the cut with my circular saw first and finishing the square cut with a long blade in a recip saw. It was gratifying to see the good condition of the fresh-cut column, even though the sections that had been submerged below the floor were crumbling with dry rot.

To replace the rotten ends, I purchased a 10-foot length of 8x10 Doug fir. This was a bit more than I needed, but it was the shortest available. It weighed a couple hundred pounds and was a bear to wrestle down the narrow basement stairs (I didn't have a good place to work on the street to cut it into pieces first).

The basement before repairs **(1)** shows the original timber support posts holding up the main beam. A closeup of one of the basement columns **(2)** shows significant decay where the wood was encased in the thin concrete floor slab.

Footings

To dig my footings, I first had to bust out the old slab to create a footing pad about 30 inches square. The existing slab wasn't that thick; it's what some folks call a "rat slab." It was just a couple inches thick and didn't have reinforcing wire or rebar in it. The fill beneath the slab was something like burnt ash, and it was full of rubble and debris—plenty of broken glass, rusted cans, a few buttons, even an unbroken bottle with a cork in it below one post. It's crazy that it never broke.

As nasty as the fill was, it was relatively easy to excavate down to the bottom of the posts: a depth of about 14 inches. I tamped down the earth at the bottom of the footing holes. One had a big rock at the bottom and I drove short lengths of rebar into it to pin it to the footing. Using a stiff mix of Quikcrete 5000—a commercial-grade, high early strength concrete mix—I began filling the holes a few inches, then laid in a grid of ½-inch rebar in the lower third of the footings. Once the holes were filled, I troweled off

With house jacks supported on cribbing, the author began raising the jacks to take the weight off the old columns **(3)**. To free the posts, he cut through the slab and excavated around the posts prior to raising the jacks **(4)**. Once the old column was loose, he stopped jacking.

the tops and applied a broom finish to match the existing slab.

New Column Bases

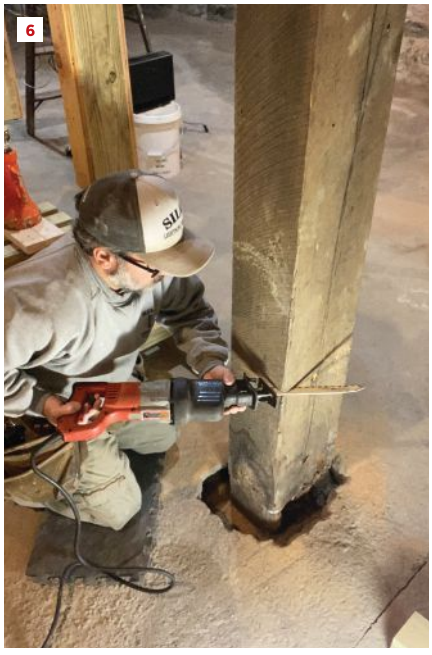
With the footings poured, I notched the ends of the existing columns to create one half of a shiplap joint to connect the new and old columns. Then, standing a 3-foot length of the new column stock next to the old column, I traced the top and sides of the notch in the old column onto the new stock and cut the matching notch.

The new column sections would be secured to the slab with custom connectors I had fabricated at an iron shop from ¼-inch plate steel. As shown in the photos, these brackets have a stand-off that keeps the ends of the new column bases about a half-inch above the slab to provide some ventilation for the bottom of the timbers. Before moving forward, I checked with the town inspector. When he saw them he commented that he thought they would last forever and gave me the green light to proceed. I bolted the steel brackets to the new footings with ⅝-inch wedge anchors.

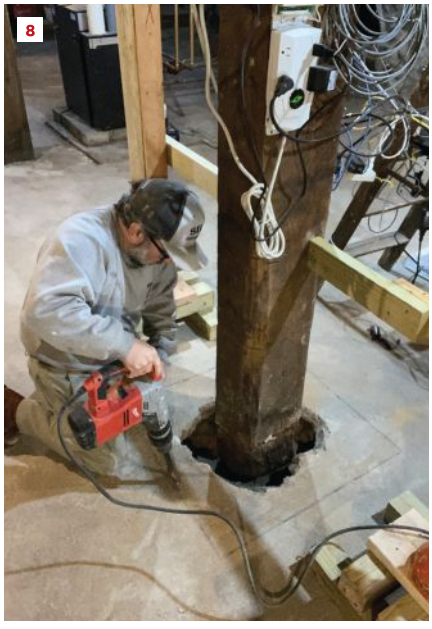
After cutting the new timbers to the correct length, I painted the bottom ends with an exterior-grade oil-based primer to provide some protection from moisture wicking up through the end grain. Next, I smeared all surfaces of the shiplap joint with a polyurethane-based construction adhesive (Loctite PL Premium) and then predrilled and joined the two pieces with ⅜-inch carriage bolts extending through the entire joint to lock it together. To secure the steel bracket to the new timbers I used 3-inch-long Simpson Strong-Tie coated SDWS screws.

The final result passed inspection and the inspector praised my work, remarking that it was likely the repair would last another 200 years.

Contributing editor Emanuel Silva owns Silva Lightning Builders in North Andover, Mass.



Using a straightedge screwed to the column, the author made an initial cut through the column with a circular saw **(5)**. Following the kerf line he made with the circular saw, he finished the square cut with a recip saw **(6)**.



The bottom ends of the columns were rotted below the slab but perfectly sound about 2 feet above the floor **(7)**. Using a rotary hammer, the author chipped out the old slab around the column for new footing pads **(8)**.


9


10


11

Each footing hole **(9)** was excavated to a depth of about 14 inches. One hole had a big rock at the bottom; the author drilled into it and epoxied short lengths of rebar to pin the rock to the concrete footing **(10)**. After filling the footing hole with about 4 to 5 inches of concrete, he placed a grid of rebar **(11)**. This put the reinforcement near the bottom third of the excavation.


12


13

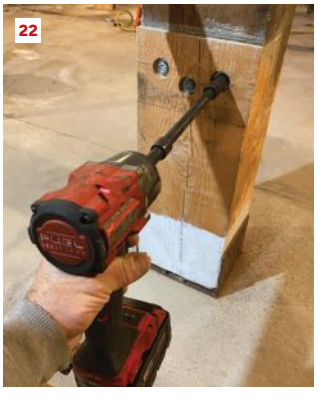

14


15


16

The author troweled off the top of the footing and applied a broom finish to match the existing concrete **(12)**. When notching the end of the old column to create a shiplap joint, he screwed a plastic square to the column to make horizontal square cuts **(13)**. These were finished with a long blade in his recip saw **(14)** before making the vertical cut to complete the notch **(15)**. Using wedge anchors, a custom steel column base was secured to the new footing pads **(16)**.

The author cut through the new timbers, beginning with a square cut with his circular saw **(17)**. With the new timber sitting in the steel connector (prior to bolting it down), he traced the notch on the old column onto the new section **(18)**. He then painted the end with an exterior primer to protect the end grain from moisture and coated all sides of the notch with a polyurethane adhesive **(19)**.



The notched timber was cut slightly short to fit **(20)**; galvanized steel washers slipped beneath the column will keep the joint tight. The author drilled through the shiplap joint for through-bolts **(21)**. With an impact driver, he tightened the nuts on the through-bolts **(22)**. Structural screws in the base finished the job **(23)**.

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The Change Order Conversation

Maintaining client trust before, during, and after a change order

by **GREG WOLECK**

PHOTOS: ADOBE STOCK

THERE IS A SENTENCE THAT MAKES many remodeling clients tense up. "We're going to need to make a change."

That sentence has ruined many an afternoon. Because in remodeling, a change order is rarely just paperwork. It represents a moment—a moment where money, expectations, emotions, timing, and trust come together and sometimes collide.

The tension is real whether the change is because the remodeler found a rotted beam behind the wall or because the client wants a different vanity after plumbing has been roughed in and fixtures ordered. Either way, clients do not hear the phrase "change order" like we do. We hear "adjustment," "revised cost," and "unforeseen condition." They hear "surprise," "inconvenience," and sometimes even "disappointment."

This is not just about forms and process. It is about how we lead in those moments, especially when clients show frustration or surprise. Handle the conversation well, and a change order can strengthen trust. Handle it poorly—even when you are technically right—and it can damage the relationship, slow the job, and make everything that follows heavier than it needs to be.

Why Change Orders Feel So Hard

Change orders feel hard because they expose uncertainty, they mix money with emotion, and they test leadership.

A lot of companies treat change orders like an administrative task: fill out the form, get a signature, move on. But that is not how the client experiences it. The client experiences a disruption to the story they were telling themselves about the project. They

thought this phase was settled. They thought this cost was known. And now here comes new information.

That can create emotional friction, frustration, embarrassment, and sometimes just fatigue.

The change order itself is not the problem—it's a normal part of remodeling. We are opening walls, working in lived-in homes, dealing with conditions that were never fully visible, and with clients who sometimes change their minds after they finally see the space taking shape.

But problems can arise if a company uses unclear communications or views normal changes like abnormal failures. Clients will pick up on that attitude, eroding their trust. A healthier way to think about it: A change order is simply the business system for handling a change to the scope of work professionally, and it should be confidently communicated as such.

What the Client Hears vs. Reality

When a client hears the words "change order," their brain often goes straight to "I'm being taken advantage of." That is not because they are difficult. It is because they were not prepared for this moment.

The client thinks: "The remodeler didn't plan properly." ***Reality:*** Remodeling involves real unknowns—behind walls, under floors, in specs.

The client thinks: "How much more is this going to cost?" ***Reality:*** The change order process is the honest, professional response to that question.

The client thinks: "This project is out of control." ***Reality:*** The client's discomfort is about surprise, not about the change itself.

Your job is to make the unexpected feel expected. You need to do that long before this conversation is needed.

Money and Emotion Travel Together

Clients have real budgets, and every change order is a direct hit to that budget. But they are reacting to more than the dollar amount. They are reacting to its meaning: "Did I make the right choice hiring this company? Is my project safe? Am I being respected?" Your language has to address all three layers.

The Form Is Not the Conversation

How you lead the moment—whether you initiate it or avoid it, whether you stay calm or get defensive, whether you present options or hand the client a bill—determines what they remember long after the invoice is paid.

Clients remember tone longer than they remember line items.

The Mindset Shift

The most important reframe in this discussion is that a change order is a leadership moment. Not a conflict. Not a favor. Not an apology.

Many project leaders unconsciously approach these conversations from one of two weak positions. The first is an apology:

"I'm so sorry, I hate to bring this up, but..."

The second is with irritation:

"Well, this wasn't included, so obviously..."

Neither is effective. An apology makes it sound like you did something wrong, while irritation makes the client feel corrected, cornered, or talked down to. In either case, trust takes a hit, and the client stops hearing the issue clearly because they are reacting to your tone.

What Leadership Sounds Like

Leadership sounds structured. Calm. Not defensive. Not emotional. It sounds like this:

Here is the situation. Describe what changed and where things stand.

Here is why it happened. State the cause clearly and without blame.

Here are the implications. Discuss the cost and scheduling impacts.

Here are your options. Always present more than one path.

Here is how we move forward. Close with next steps and documentation.

These five points provide a structure, something solid for the client to hold onto. That structure replaces tension with process. It shows that even when something changes, the project is still being managed professionally.

When you stop treating the change order like a personal failure and start treating it like part of responsible project leadership, everything improves: your tone, your confidence, and the client's trust.

The following steps will help you maintain trust before, during, and after the change order conversation.

Winning the Change Order

This is where real professionals stand out. You win the change order before it happens by setting expectations early—at kickoff, at contract review, at project launch—before the client is emotionally invested in a new idea or surprised by a hidden condition. Clearly communicate that changes are part of the process, not failures.

Not mistakes or lack of planning. Process. Remodeling involves many moving parts. Sometimes clients make changes. Sometimes unexpected conditions are uncovered. This one sentence is more effective than any policy document:

"If something changes, we'll pause, price it clearly, and get your approval before moving forward."

The language is calm, clear, and professional. It doesn't sound threatening or defensive. It doesn't leave the client wondering what happens next.

Early Expectation-Setting Matters

People handle hard news better when it fits inside a structure they already understand. When the client knows how change orders work—because you told them at the beginning—they are less surprised, less emotional, and more likely to trust the process and approve quickly.

If the first time a client hears your

Clients don't hear things the same way that you and your crew do. They are emotionally invested and need to hear that you understand their feelings before they can hear the facts.

change order philosophy is during a tense moment, you are already behind. Set the expectation at the start. Turn the future surprise into a previously explained process.

Use Consistent Language

Many teams agree on the principle but communicate it inconsistently. The project manager says it one way. The salesperson says it another way. The production lead says almost nothing. The client gets mixed signals, which creates confusion.

In emotionally sensitive moments, prepared language is not robotic—it is helpful. You do not need a speech, but you do need a few reliable phrases your whole team can use with confidence:

- "Changes are normal in remodeling. Our job is to handle them clearly."
- "If something shifts, we'll talk about it before we act on it."
- "We never want you surprised by cost or schedule."
- "The goal is not to avoid change at all costs. The goal is to manage it well."

When everyone on your team uses consistent language, the client has a consistent experience. That builds trust.

Read the Room First

Some change order conversations are more about the client's reaction than about the change itself. That reaction is a signal—and professionals know how to respond to it.

The Four Red Flags

If the client exhibits any of the following, it's a sign that they are leading with emotion. Your response needs to take that into account.

Overt emotional reactions (frustration, tears, a raised voice). The client is no longer processing information. They are processing feelings. Acknowledge that before explaining.

"Can't you just..." signals that the client wants to skip the process. It is a boundary test, not a real question. Educate calmly rather than defending.

Rushed decisions. Agreeing too quickly without asking questions often means the client is overwhelmed and not satisfied. Slow down and help them ask at least one question.

Silence or withdrawal. Going quiet is not acceptance. It often means the client is pulling away emotionally. Check in and do not assume silence means everything is fine.

Acknowledge Before Explaining

Again, if you lead with facts when the client is emotional, they will not hear the facts. They will only feel unheard. Acknowledge first, explain second, every time without exception. Here is what that sounds like:

- "I hear you. This wasn't what you were expecting."
- "I understand this feels like a lot right now."
- "I want to make sure we handle this the right way for you."

A Five-Step Framework

When people have a process to follow, they stay calm. This five-step framework provides your team with a reliable structure for any change-order conversation. It serves the client, your team members, and the relationship all at once.

Acknowledge. Show you heard them. Do not lead with facts. ("I know this isn't what you were expecting, and I want to walk you through it carefully.")

Explain. Describe what changed and why, clearly. ("Here's what we found: [describe condition]. This wasn't visible until we opened the wall.")

Present options. Offer choices—never just one path. ("You have two options. We can [Option A] or [Option B]. Here's what each one means for the project.")

Clarify the numbers. State the cost, scheduling impact, or both. ("Option A adds $[X] and [Y] days. Option B adds $[X] with no schedule change.")

Pause. Stop talking. Let them re-

spond. ("Take a moment. What questions do you have?" Then go quiet.)

This last step deserves emphasis. Most remodelers talk too much after presenting a change order. The pause is where the client processes and responds. Silence after presenting is not awkward—it is professional.

These are not word-for-word scripts. They are starting points. The goal is to give your team language they can adapt while maintaining the five-step structure.

Avoid Sounding Defensive

Confident does not mean confrontational. You can hold your ground and hold a positive demeanor at the same time. The key is language. Compare these very different statements:

Instead of: "I'm sorry, but this is going to cost more." ***Say:*** "Here's what changed and what it means for the project."

Instead of: "We have to charge you for this." ***Say:*** "We want to be transparent about this before we move forward."

Instead of: "That's not in the contract." ***Say:*** "This falls outside the original scope of work. Let me walk you through the options."

Instead of: "There's nothing I can do about it." ***Say:*** "We'll get your approval before anything changes."

The difference between these is not just tone—it is the difference between a client who feels cornered and a client who feels informed. Apologizing implies fault. Explaining shows professionalism. Your team should never apologize for a legitimate change order. They should explain it clearly, present options, and let the client decide.

Documentation Is Non-Negotiable

If it is not documented, the conversation is not finished. Verbal agreements disappear. Written confirmation protects everyone—the client who agreed, the project manager who explained it, and the company that needs to recover the cost. Documentation is not bureaucracy. It is professionalism.

Three Common Scenarios

These are not fringe cases. These are common. Here is how to handle each one at a professional level.

1. Late-stage design changes. The client selected tile three months ago. Cabinets are ordered. Countertops are templated. Now they want to change the tile, and they do not understand why it is a problem.

Without a process, the team absorbs the cost, restocking fees go uncommunicated, verbal "okays" are assumed, and the margin erodes while resentment builds.

With a process:

Acknowledge the request without judgment. Say, "I understand you'd like to make a change. Let me look at what's involved."

Define the full impact. Include restocking fees, reorder lead time, scheduling shifts, and cost delta.

Present the options clearly. The primary choices are to proceed with the change order or to stay with the original selection.

Get written approval before acting. No verbal agreements. Document the decision and the cost.

2. Scope creep disguised as small tweaks. "Can you just add an outlet there?" "Move that switch?" "Touch up that wall? It'll only take a minute."

The problem is never the first request. It is the tenth one, and the fact that none are documented. Scope creep is as much a company culture problem as a process problem. Your team has to be trained to say, "let me price that" instead of "sure, no problem." That shift protects the margin and actually builds more trust with the client.

With a process:

Track every out-of-scope request in writing.

Bundle small items into a single change order conversation.

Use the phrase: "That's outside our current scope—let me price it."

Documenting a change order protects everyone involved—client, team, and company.

Change orders do not damage trust. Poorly led change order conversations do. Your job is to be calm, factual, and empathetic.

Never say yes in the moment without checking the scope.

Remind the client of the process established at kickoff.

3) Unforeseen conditions. The most defensible change orders are also the most emotionally difficult for clients. They did not budget for it. They feel blindsided. Your job is to be calm, factual, and empathetic. Show them the problem. Explain the risk of ignoring it. Then give them a clear path forward.

Here's the protocol when the walls are opened up and the job changes:

Stop. Halt work on the affected area immediately.

Document. Photograph everything before any remediation.

Notify. Contact the client before proceeding. No surprises.

Explain. Walk them through what was found and why it matters.

Price it. Present a clear change order with options when possible.

Approve. Get a written sign-off before resuming the affected scope.

These conditions are not your fault. But how you communicate them is your responsibility.

The Common Thread

Three scenarios, one standard: pause, communicate, document. The scenario changes. The professionalism does not.

Keep the Relationship Strong

The change order conversation does not end when the client says yes. How you close the loop determines whether they refer you, return to you, or quietly move on.

Clients do not remember the dollar amount of the change order as much as they remember three things:

How clearly it was explained. Clarity signals competence. Confusion signals chaos.

How respected they felt. Clients who felt rushed or dismissed during a change order conversation remember that long after the project ends. Respect is the foundation of every referral.

How predictable the process was. When the change order process matches what was explained at the start, clients feel safe. Predictability builds confidence. Surprises destroy it.

Follow the process you promised at kickoff every time, even under pressure. The change order is not the end of trust. It is a test of it. Teams that handle it well do not just keep clients. They earn referrals.

The Bottom Line

Change orders do not damage trust. Poorly led change order conversations do. And that is entirely within your control.

The team that handles change orders with clarity and confidence—that sets expectations early, reads the room during the conversation, follows a structure, and closes with documentation—builds clients for life.

When you lead the conversation, you control the outcome.

Greg Woleck is a consultant and program leader at Remodelers Advantage, the host of the Why We Build *podcast, and a frequent speaker at JLC Live.*

Products

by **VINCENT SALANDRO**

1. Soft-Cornered Hardware

The Amplify Collection of hardware from Atlas Homewares features soft, rounded corners paired with gear-like detailing to create an aesthetic that complements any design style. The collection features 48 pieces in pull sizes ranging from 3¾ inches to 12 inches and appliance pulls ranging from 12 inches to 18 inches. The pulls are available in matte black, brushed nickel, polished chrome, polished nickel, slate, and warm brass finishes. *atlashomewares.com*

2. Regional High-Performance Skylight

Velux has launched its Residential Polycarbonate Dome Skylights for select markets in the southern United States prone to severe weather or consistent high heat. The polycarbonate dome lights were developed to meet impact-resistance and hurricane codes present in many southern markets. Velux says the skylights protect against 2-inch hail, carry a Class A Fire Resistance Rating, and have been tested to endure heavy wind gusts, rain, and wind-borne debris. *veluxusa.com*

3. Fire-Resistant Roof Underlayment

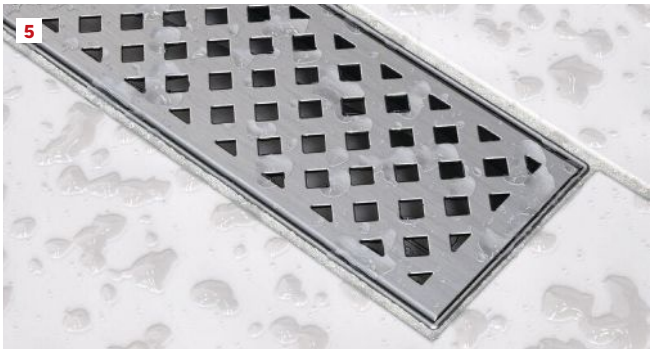
Westlake Royal Building Products is positioning FYRATEK as a fire- and ember-resistant roof underlayment. The product is designed for use with concrete and clay tile roofing systems in high-wildfire-designated regions. FYRATEK features a non-combustible aluminum surface designed to reflect heat and to prevent burning embers from igniting the roof deck and underlying structure. It carries a Class A fire rating when used with tile roof coverings and is listed for use in California's Wildland Urban Interface regions. The product has a grid-patterned surface for enhanced foot traction. *westlakeroyalbuildingproducts.com*

4. Exotic-Replicating Bamboo Foamed PVC

Eva-Last has expanded its Pioneer composite decking line with two new colors. True Ipe and Weathered Ipe are designed to replicate exotic hardwoods without the maintenance or supply issues of real lumber. The boards use bamboo foamed-PVC and glass-fiber reinforcement for strength and stability, plus a protective wear layer that is said to resist fading, moisture, scratches, insects, and harsh weather. *eva-last.com/us*

5. Geometric Drain Cover

The Trellis drain cover from Oatey enhances the manufacturer's portfolio of design-forward decorative drains. For maximum installation flexibility, the Trellis cover comes in multiple sizes and is compatible with both linear and square configurations of Oatey's 130 Series Tile Shower Drain base. The drain cover features a geometric pattern with a symmetrical design crafted in a brushed stainless-steel finish. The 2-inch outlet adapter with an O-ring attaches to standard drain outlets. Oatey says the Trellis drain cover is compatible with both PVC and CPE waterproofing liners. *oatey.com*



6. Black Performance Roof Shingle

IKO has launched Blackstone, a new color in its performance shingle range within the IKO Dynasty collection. A rich black shingle, Blackstone pairs with most exterior palettes while offering a Class 3 impact rating. The shingles are engineered with ArmourZone technology, featuring a 1-¼-inch nailing surface for enhanced fastening strength and a limited wind-resistance warranty for up to 130 miles per hour. Tear-resistant tape backing is designed to help prevent nail pull-through and blow-off while the FastLock sealant is supposed to activate under sunlight to form a strong bond against water infiltration. *iko.com/na*

7. Hand-Crafted Door Levers

The six door levers in Omnia's Mano Collection are hand-crafted from high-quality, solid, lead-free brass to ensure durability and corrosion-resistance. A final hand polishing softens every edge and enhances the appearance of the pulls. The levers are available in a choice of round or square roses, and with polished, satin, or powder-coated finishes. *omniaindustries.com*

8. One-Touch Garbage Disposal

The Composer One Garbage Disposal replaces the typical wall switch with a one-touch control lever on the sink. The disposal features a patented drain iris that seals shut during operation. The manufacturer says it's quiet and uncloggable, is compatible with industry-standard mounting brackets, and features a built-in safety interlock. They also claim that the 1-horsepower high-torque motor is 20 decibels quieter than the typical garbage disposal while offering two times the power. *composer.me*

9. An Alternative to Joist Tape

FastenMaster's Deck Frame Coating is a water-based sealant that the company says will help extend the life of a deck by creating a lasting moisture barrier. The coating can be rolled or painted onto the top of deck joists, ledger boards, stair stringers, posts, beams, and other framing components. Once dry, it creates a durable seal that deters wood rot and decay. The coating is available in one-gallon buckets that offer up to 450 linear feet of coverage on 2-by framing. The coating does not contain any VOCs or solvents, and it is non-flammable. *fastenmaster.com*

10. Compact Recessed Lighting

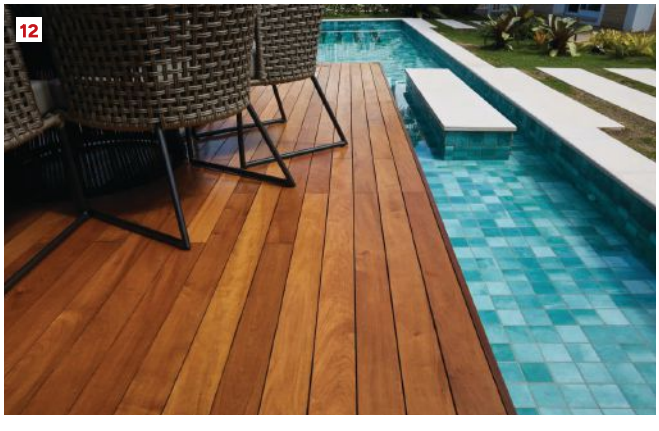
USAI Lighting's Small In One - Mini is a compact, install-from-below recessed light fixture that delivers what the company describes as specification-grade performance without compromising aesthetics or flexibility. Delivering over 2,000 lumens through a 3-inch aperture in a profile that's less than 4 inches tall, it combines downlight, adjustable, and wall wash capabilities in one versatile platform. Designed for flexibility and clean ceiling aesthetics, the fixture offers up to 40 degrees of tilt, multiple trim styles, and LED color options. *usailighting.com*

11. Recyclable, Reusable Floor Protection

Gator Guard is a high-strength floor protection product designed for new construction and renovation applications. The multi-layer floor protection system is waterproof, water-absorbent, cushioned, and recyclable. The manufacturer says that Gator Guard is designed to be re-used multiple times, and that the surface can be wiped or vacuumed clean. The top layer features the company's Hexa Grip Anti-Slip Technology, a patented surface to provide enhanced traction when walked on. *gatorguardus.com*

12. High-Strength, Pre-Finished Deck Board

Maximo says that its Hardwood Sablewood 5/4 boards offer a rich color tone along with the strength of a true tropical hardwood. Touted as a substitute for Ipe, Sablewood delivers similar durability and performance. The boards' pre-finished surface reduces labor needs and protects them during installation. They can be used for purposes that include decking, cladding, fencing, and pergolas. *maximowood.com*



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SawStop CTS Jobsite Table Saw

by **NATHANIEL CARLSEN**

SawStop table saws, which are supposed to immediately brake when the spinning blade contacts skin, are a controversial topic amongst carpenters. So, when I decided to purchase their Compact Table Saw, or CTS, I heard some strong opinions. "I really wanted to hate this saw," quipped one of my coworkers, echoing a sentiment many share for some reason: The saws or the company are apparently worthy of ire. I'm not going to parse those discussions, nor will I write a lecture about jobsite safety, at least not a long one.

What I will say is that I put off buying a table saw for years because I knew that I wanted to buy a SawStop but always felt that the price for their CTS was painfully high compared to the non-braked alternatives. If I'm going to put that kind of coin into a tool, I like to be able to point to specific capabilities that set it apart. But I went ahead and bought it. After using the CTS for the last few months, I now know those capabilities: It is an excellent tool, whose build and features stand apart from its competitors.

The first thing my coworkers remarked on was the saw's size and heft. "You won't cut off your finger but you will throw out your back," my manager joked. Its weight and size offer an upside and a downside. Anyone expecting a tool like the Dewalt jobsite saw, which is light and easily portable, is liable to be disappointed by the CTS's 68-pound weight. When set up, however, the CTS is a beast with ample power. I ripped several hundred feet of mahogany and it didn't falter. Its 10-inch blade powers through material, and the large table, not quite a 2-foot square, provides a solid platform.

The SawStop CTS provides 24 ½ inches of supported rip capacity with a sturdy base—the saw weighs 68 pounds.

Indeed, the big table is one of the things I love about the saw, because it elevates the tool beyond a simple ripping machine.

I've also been impressed with the cut quality. I am in the process of building a variety of router jigs, which involved a lot of crosscutting. Before building my crosscut sled to accomplish the task, I evaluated and tuned the CTS for blade alignment. While the CTS came relatively aligned, some adjustment was needed. Thankfully, this is a fairly simple process, and the difference was noticeable: Cuts improved from what I would expect from a jobsite saw to buttery smooth. Using the saw to build a loose tenon jig, I found the saw quite capable of the accuracy I needed.

The details of this saw are reminiscent of other jobsite saws, with the rack and pinion fence that seems to have become a standard feature in this category. One difference is that SawStop has changed the locking mechanism, opting to locate it within the adjustment knob in a pull-to-unlock, push-to-lock action. I find the force that's needed to lock the fence a bit too violent for my taste, though I have never noticed any movement of the fence as a result. Over time, however, I have come to appreciate the ability to adjust and lock the fence with one hand, although the mechanics of doing so took some getting used to.

The bevel adjustment mechanism is a dream and housed around the blade-height crank. The bevel mechanism is unlocked by pulling on the surrounding housing and locked by pushing it in, with the entire blade assembly able to tilt to angles that range from -2 degrees to 47 degrees. Where SawStop really pushed the envelope on the bevel adjustment is with the micro adjust feature, which allows the ring that locks the bevel to rotate and adjust the bevel angle very slowly, click by click. This makes achieving an exact angle incredibly easy, which is a rarity in saws of this class.

Dust collection is also good. I haven't hooked the saw up to a dust collector, but SawStop has built a plastic housing around the entire blade and motor assembly, which seems to direct most of the dust out the chute in the back even without any suction involved. This is another area where the increased size and weight are well worth the benefit in my opinion. The

PHOTOS BY NATHANIEL CARLSEN

Weigh In! Want to test a new tool or share a tool-related testimonial, gripe, or technique? Contact us at jlctools@zondahome.com.

saw houses its accessories in an enclosed panel behind the saw that keeps everything organized and available.

One gripe I have with this saw pertains to the slight wobble of the blade, which results from the sudden start to the motor (which is also very loud). That's standard for a jobsite saw, but still irksome.

Then we have SawStop's proprietary blade brake system, which continually monitors the blade. When the blade touches an electrically conductive material (such as skin), that prompts a spring-loaded cartridge to drop a hunk of aluminum into the blade, stopping it almost instantly. This keeps the saw from cutting off fingers but it also means that cutting wet lumber or aluminum requires initiating a bypass mechanism to deactivate the blade brake system—which disables the safety for the user also. I don't find this procedure to be much of a hassle, especially after doing so routinely, but I can imagine certain working environments where this would be an issue. I have set off the brake on our shop saw before with metal-on-blade contact, and I'll be honest here, it stank. At $100 a brake cartridge, plus a new blade and the lost working time, it's an error that I'd rather not make again.

It's hard to know what to make of the CTS. It's capable of executing high-precision detailed work while keeping a clean worksite, far beyond any other jobsite saw I've used. This isn't a tiny table saw to be thrown around, nor is it a larger contractor or cabinet saw geared toward shop work; instead, it sits somewhere in between. For me it's perfect, because it lets me rip 2-by material onsite and to do finer finish work in my spare time.

Then, at long last, we come to the primary selling point of the saw: It's safer to use. I love using this saw because I know that if things go sideways the saw has my back and that of my coworkers. Many carpenters will remark on how many years they've used a table saw without issue and that decades of experience means there's little benefit to the SawStop, only hassle. It is true that with proper technique and an alert mind other table saws can be used safely. But what about all those times when we didn't sleep well and were tired? What about the 4 p.m. rush, when we have just one more little thing to finish even though we really should stop? What about sheer, uncaring, unwavering chance?

I get in and out of my vehicle thousands of times a year and every time my keys make the same trip from hand to belt. And yet I occasionally manage to lock my keys in the van, sometimes due to a situation, sometimes from a mental slip. Do something long enough and you end up playing a game of probabilities with a few wild cards thrown in. Sometimes it's a call to the locksmith, others it's a trip to the ER. Experience, mental focus, and muscle memory will change the odds of the game, but don't be fooled, you're still playing. Now SawStop has come along with a trump card in your favor.

The author found that the saw provided the performance of a larger cabinet saw but with added safety. This allowed him to do higher-precision work and not need a shop-level saw with its size, price, and mobility restrictions.

It might not be a perfect saw, and it might cost a lot more than the competition, but it's a top-tier tool. Maybe, just maybe, you'll be sitting at home in 10 years regretting those extra hundreds you spent on the SawStop because the saw never proved its worth. Somehow, I doubt it. You'll set off the brake a few times by accident and feel a little regret. You'll grow tired of turning off the brake when the PT lumber you got seems like it was pulled out of a bog. But you'll also do excellent work with a saw that relishes a challenge. In the end, it all blurs into normalcy until that day when you hear a clunk and turn around to see your coworker with only a nicked finger and a bruised ego. On that day, it's clear that the CTS is the obvious choice. The SawStop sells for $975 (the base saw) and $180 for the folding stand, and you can find it at *Sawstop.com*.

Nathaniel Carlsen is a carpenter with TDS Custom Construction in Madison, Wis. Follow him on Instagram at @nvcarlsen.

The DeWalt DCS520B Cordless Track Saw

by **MARC FORGET**

Tool descriptions often get overdone with words like "revolutionary or game changer." In a rare case I will come across a tool type that actually improves my work. Finally buying a track saw was one of those cases. The DeWalt DCS520B cordless track saw was not a purchase I made lightly, because of the cost, but I have not regretted it. With any track saw kit, buying the saw is only one part of the investment. You need tracks, track connector, clamps, a track carrying case (optional but good protection for the tracks), and the saw. All told, for my setup I was in for around $800. I was able to bundle the purchase to save on cost, so if you are in the market, for whatever brand, keep an eye out for this kind of offer.

The saw has a 6 ½-inch blade, offers a soft start, and can plunge-cut through material up to 2 ⅛ inches thick at 90 degrees and 1 ⅝ inches thick at 45 degrees. The depth of cut and bevel are both accurately controlled by easy-to-use dials and stops on the top side of the saw. The blade is guided during the cut by the grooved track where. The light aluminum track has foam strips (replaceable) on its base that help keep the track in place for quicker cuts. And a slot on the base allows for clamps to be fitted to ensure no track movement when accuracy is vital. Each track can be linked with a connector bar to allow for longer runs—the individual lengths available from DeWalt are 46, 59, and 102 inches. The rubber strip on the two long edges reduces splintering, shows where the cut line will land, and is also replaceable when it wears with use. The result is very straight cuts with very little tear-out.

I have used track saws, both corded and cordless, from other manufacturers (Festool, Makita, Bosch) and have found no real difference in performance. Each had some fit and finish pluses and minuses, but, in my experience, those came down to minor personal preference and not major features that would change purchase choice. (Just to give you some peace of mind in whatever you may choose.) For myself, I already had batteries from DeWalt and went with the brand that had the best sale at the time.

In terms of cordless power I have had no issues. I have cut down oversized 2-inch-thick veneer doors with solid-wood or Structural Composite Lumber (SLC) cores without bogging down and without noticeable splintering. Where I have enjoyed the saw the most is breaking down sheet goods: 4x8 or 5x9 finish-grade plywood and painted or stained cabinet panels. Being able to set up sawhorses and a sheet of rigid foam (with 2x4s or plywood support) and break down material accurately on my own has been a time saver. The weight of the saw at 18 pounds with the battery (60-volt 9-amp) is not a burden and is easy to run along the track. Run time for the saw has not been an issue in my workflow if I start the day with two charged batteries. Charging time has kept up with the number of cuts I have needed. Dust management has been great when I attach my vacuum to the 1 ¼-inch dust port. While I still run a room air cleaner for the finer dust, most of it is picked up with the vacuum attachment. I have used the saw to make cutouts for inlays in hardwood floors and have found the depth of cut and the cut start and stop points easy to manage and control. Overall, it has performed as ordered: It's been reliable, powerful enough, and has allowed me to manage on my own what I would have needed a larger table saw and an extra person to do.

The butcher's bill for the setup that I have if you buy them separately: the saw (bare tool), $490 with one battery; the charger, $580; two 46-inch tracks at $87 each; one 59-inch track at $90; the track bag, $45; clamps, $30 (not DeWalt but others work fine); and the track connector bar, $40. I also picked up a single hex key for $5 that fits the connector bar screws (the bar doesn't come with one). Again, there are bundles (and sales). The DCS520B is an investment, but I've made it back in what I have been able to produce. Available at *Dewalt.com*.

The depth and bevel controls are readable and accurate, with bevel locks at both front and back (left). With the author's kit he can break down sheets, prefinished doors, and panels (right).

PHOTOS BY MARC FORGET

Marc Forget is an associate editor at JLC.

Dri-Eaz HEPA 700 Air Scrubber

by **JAKE LEWANDOWSKI**

Earlier this year, I really dug into air scrubbers. Our last unit had finally bitten the dust, and unfortunately the manufacturer had gone out of business, leaving us filterless and high and dry when it came to replacement parts.

There's not a huge difference in purification between air scrubbers equipped with a pre-filter and a main HEPA filter. There is, however, a wide range of sizes and airflow. I found portable units with cfm ratings ranging from 500 to 1,000, as well as larger units going all the way up to 2,000 cfm.

What I needed was a unit that one person could easily load and unload from a truck and that could fit through access holes when needed. Another key consideration was filter price and availability, as well as access to repair centers if the unit ever needed servicing. Lastly, I wanted to make sure the unit sealed up for transportation and had some sort of cord storage. I landed on the Dri-Eaz HEPA 700 air scrubber. It weighs 42 pounds, making it easy to load and unload, though it's a bit larger than I'd like at 23 inches tall, 26 inches wide, and 17 inches deep. Still, that was not a deal breaker. Otherwise, it checks all the boxes and then some.

The Dri-Eaz HEPA 700 is not the cheapest unit out there, with prices varying by supplier, but it's sold all over the country and filters are readily available. I purchased mine locally and paid $1,200 plus tax, putting it at just over $1,300 out the door. I can also get the filters locally, and their cost is more reasonable than that of other units in its category. Pricing for the filters, like the unit itself, does vary by supplier. A box of five 2-inch MERV-8 pre-filters cost me just over $90, or about $18 each, and the main HEPA filter costs just under $180. That's cheaper than what I was paying before, and I don't have the additional cost of shipping on top of it.

Dri-Eaz also offers, for the HEPA 700 air scrubber, a 1-inch activated carbon filter that you use in conjunction with a 1-inch pre-filter. It is designed to remove the smell of smoke along with other odors, which is ideal for us when field-welding inside someone's home or business.

The unit has a variable-speed fan ranging from 275 to 700 cfm. Even at full blast, the noise it generates is dwarfed by the sounds of an active jobsite. Operation consists of an indicator screen that shows the unit's filter status and current fan speed, along with an on/off switch. There is also a mobile app available that allows you to monitor and fine-tune airflow. Dri-Eaz offers two styles of ducting: a semi-rigid inlet or outlet duct that is wire-supported, and lay-flat ducting, which is what we have been using. Lay-flat ducting is a roll of 14-inch-diameter plastic that you cut to length and use only as outlet ducting. Like all available air scrubbers, filter life varies greatly from task to task, and you might easily need to replace pre-filters daily if you're demo-ing plaster or removing an abandoned chimney, for example. That said, it seems to be comparable to air scrubbers we have owned previously.

The Dri-Eaz HEPA 700 air scrubber is a durable, professional-grade unit. The exterior shell cleans up easily, filter changes are simple, and its cost to operate is lower than most. *Drieazz.com*

Jake Lewandowski is a construction manager with Chicago-based Great Lakes Builders.

PHOTOS BY JAKE LEWANDOWSKI

Cord storage is easy and the rugged unit has a built-in carry handle **(left)**. The Dri-Eaz 700 has a digital readout that shows the status of the filter at a glance. With its built-in GFCI, users can gang multiple units together onsite **(right)**.

The Battle With Stuff

by **MARC FORGET**

How much ballast have you collected in your life in construction? I know I could equip a small hardware store with what I have accumulated. From talking to many colleagues and contributors I know I am not alone. In my case I spent much of my career as a generalist. One week I was installing hardwood, the next I was framing an addition. I also had a small general contracting business with a friend for years. In that business we also did some minor electrical, plumbing, and HVAC work.

The pile would often be fed like this: I'm at the store and need a braided line for a toilet. Will the 12-inch be enough or will a 16-inch be better? I am a firm believer in "better looking at it than for it" so I buy both. The one I don't use goes into my extra stock because I am sure I will need it eventually. This same situation gets played out with all manner of things. Very quickly I have enough supply lines to braid a net and enough plumbing fittings for the world's greatest hamster habitat.

Then comes the tonnage of fasteners! If I needed 3 ¼-inch coil nails, well I would buy a case of course. Buying in bulk is cheaper per unit and more efficient with the extra saved for the next job. In theory this should work out, but there was always overflow. The next job would use up the leftover case and then consume another quarter case. Result: the bulk grows. This repeats with all manner of nails and screws, and that is just the regular rotation items. I swear it breeds.

Then I have the orphans: half a case of roofing nail coils (I haven't touched shingles in years); the specialized bolts for timbers (a pack of ten but I needed only eight). When was the last time I hand-nailed sheeting? Ten pounds of a 20-pound box of nails are up for grabs if you want to stop by. Also some specialized (and expensive) sealer for natural stone (we needed a few brush strokes, but it only comes in quarts). With these lost souls of fasteners or material the extra left at the end of the job found its way onto a shelf or into a crate, but with little opportunity to use it again.

Another way the pile got fed is all those instances when I could have played archeologist and sifted through the boxes to find an item but going to aisle 12 of the blue or orange home supply store was quicker.

The issue with this mountain of "just in case" or "I'll use it eventually" is that most of it doesn't have an expiration date. It also cost money, sometimes a lot for the specialized one-offs. So, I am invested capital-wise and don't have an end date to use it by. I am also hooked by the memory of that one time when I couldn't get the item (remember Covid?) but I had just what I needed.

So, beyond the occasional "Ah Ha" moment or the world-spanning pandemic, the pile may get picked at for a project, but mostly it sits.

When my partner and I had the business, we tried to mine the stock as each job rolled to the next. We also started a rule that if we moved something in our storage space twice without using it, then its third move would be to the bin. Now the "bin" items would ideally go to another contractor or donation or recycling center, but some things did just go to trash. What we found was that the time wasted looking for or holding onto something was not worth the effort in keeping it. The better organization and ruthless pruning of the stock kept us from being buried in a cave-in, but a few things still piled up. Things from that time plus another decade now live in my garage and basement and get in my way during the seasonal ebb and flow of my home life.

Talking to a friend at JLC Live, he told me about having to clear out his garage to make space for other storage items and materials. It was a large shell game of stuff between garage, shipping containers, and shed. I felt for him and we both agreed that it was a massive waste of time and mental energy. We also agreed the solution wasn't more shelving but less stuff.

All that made me realize that while ballast in a ship provides stability, in my garage and in my friend's garage that ballast is just a burden. It wastes time now and defers organizational effort to the future.

As I write this in May, spring is (very slowly) happening here in Ottawa and it's time for a spring clean-out. I'll pass some on to friends, consolidate items to allow for better access, and donate some. Wish me luck as I wish you luck with your hoarded pile of treasure. Then maybe I will look at some of my tools. Why do I have three reciprocating saws and how many drills do I really need? Good god, when did I buy this thing?

Marc Forget is an associate editor with JLC.

PHOTO BY MARC FORGET

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