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On the cover: Kenny O'Gorman and Delfino Ortega help clean up a basement in Colorado in the aftermath of the September 2013 flood. AP photo by Manuel Valdes.

THE JOURNAL OF LIGHT CONSTRUCTION (ISSN 1056-828X), Volume 32, Number 6, is published monthly by Hanley Wood, One Thomas Circle, NW, Suite 600, Washington, DC 20005. Annual subscription rate for qualified readers in the construction trades: \$39.95; nonqualified annual subscription rate: \$59.95. Publisher reserves the right to determine recipient qualification. Copyright 2014 by Hanley Wood. All rights reserved. Canada Post Registration #40612608/G.S.T. number: R-120931738. Canadian return address: Pitney Bowes Inc., PO Box 25542, London, ON N6C 6B2. Periodicals postage paid at Washington, DC, and at additional mailing offices. POSTMASTER: Send address changes to The Journal of Light Construction, PO Box 5853, Harlan, IA 51593-1353.





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**Executive Editor** Clayton DeKorne, cdekorne@hanleywood.com  
**Art Director** Sarah Bell, sbell@hanleywood.com  
**Managing Editors** Ingrid Bush, ibush@hanleywood.com;  
 Laurie Elden, lelden@hanleywood.com  
**Assistant Managing Editor** Carey Hodges, chodges@hanleywood.com  
**Illustrator** Tim Healey, thealey@hanleywood.com  
**Senior Editor** Roe Osborn, rosborn@hanleywood.com  
**Graphic Designers** Jen Aranyi, jaranyi@hanleywood.com;  
 Kim Lofgren, klofgren@hanleywood.com  
**Contributing Editors** Michael Byrne, Michael Chotiner, Ted Cushman,  
 David Frane, Bruce Greenlaw, Dave Holbrook, Joe Stoddard, Jon Vara,  
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**Senior Web Developer** Braddock Bull, bbull@hanleywood.com  
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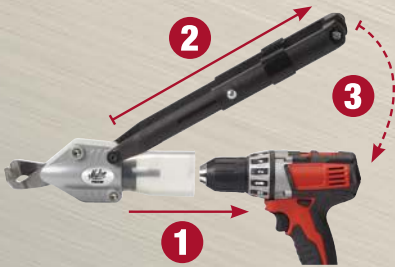
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## Reader Feedback

The following excerpts are taken from comments in response to the JLC articles referenced.

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# Letters

### **“WORKING WITH LARGE BEAMS,” BY TIM UHLER (DEC/13)**

I subscribe to and enjoy your magazine. But I was disturbed by the December 2013 article by Tim Uhler, “Working With Large Beams.” Photograph 3 on page 18 [shown below left], depicting a forklift with a beam and a worker on a ladder, shows the perfect conditions for a fatal accident. As a construction consultant and expert witness, I have reviewed the aftermath of many preventable accidents. I am currently aware of a double fatality in which a beam of a similar size “tipped” and came down on two workers in a scissors lift. It was in a situation similar to the one shown in photograph 3.

Although the author indicates that “it isn’t safe and it isn’t very smart [to manhandle beams without equipment],” the worker on the ladder is in a virtual “dead fall” position and is risking his life. Extensive damage would be caused to the structure from dropping a beam of that size even if the worker escaped injury. The beam shown is much taller than the narrow width that is “balanced” on the forks of the lift, typically 5½ inches, and is located

outboard of the mid-span of the forks. This setup could easily allow the beam to tip and possibly flip off the end of the forks if the lift were to jerk or move suddenly. If this lifting method is to be used, the beam should rest against the backstop of the forks, and be secured to prevent tipping. Outriggers may be necessary if the span of the forks is too narrow for balancing a beam of that length. Photograph 4 [below right] appears to be a better setup, with the beam against the backstop and the weight of the posts preventing tipping.

I am pleased to read that Tim Uhler’s crew has “never had an accident” (yet), but I would recommend proper training and certification for the lift driver, and training in the proper use of ladders for all workers.

—James R. LaCroix, LaCroix Davis LLC, Folsom, Calif.

*Tim Uhler responds:* In photo 3, the worker is positioned to the side of the beam. If the beam were to tip forward (relative to the cage), it couldn’t fall on him. The forklift has outriggers down, so there isn’t a tip hazard to the machine, and it is clear from the photo that the forks are tilted back toward the cage, so the beam would only tip toward the cage. The writer brings up an excellent point about training. In our case, the driver has been certified multiple times as a “lift driver,” and we always plan our lift and discuss any anticipated problems. Our perfect “no accident” record is no accident. It comes from not being cowboys on the jobsite.

When a beam is lifted with a forklift, care must be taken to ensure the beam can’t tip forward. The worker guiding the beam into place must stand out of the way to avoid a “dead fall,” and at the very least, the forks should be tipped back toward the cage (near right). Best practice calls for resting the beam against the backstop *and* keeping the forks inclined so the beam can’t tip at all (far right).



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**Q** I have a client with an older home on a slab with an uninsulated foundation. In our northern climate, the perimeter of the floor gets very cold in winter. Would insulating the foundation from the outside make a significant difference in how cold the slab gets?

**A** Steve Baczek, a residential architect from Reading, Mass., who specializes in building science, responds: Because the edge of the slab links directly to the cold outside air (via the uninsulated foundation), the surface temperatures of the floor and wall materials at the perimeter of the house will be cold as a result. Preventing warmth from escaping along the edge of the slab would greatly improve the floor temperature at the perimeter of the house, and applying a layer of insulation to the outside of the foundation is an excellent way to do this.

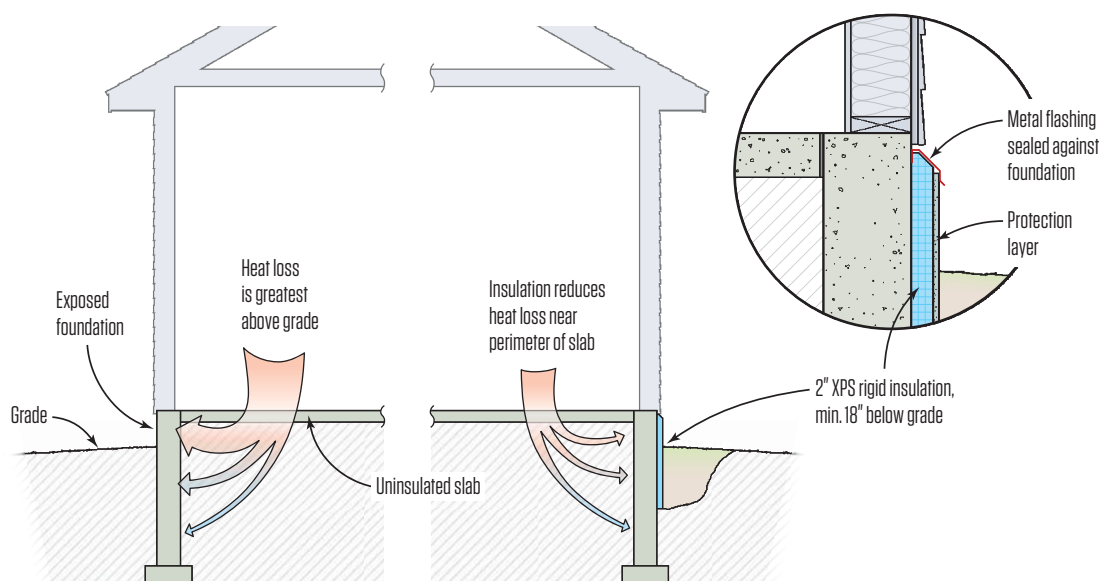
How much insulation? The more the better. I'd recommend 2-inch XPS (extruded polystyrene) rigid foam, which has an R-value of 10. But depending on the details of your client's home, the outside plane of the foam board may stick out past the siding, creating an aesthetic problem. And finding a visually acceptable protective covering for the rigid insulation might also be a chal-

lenge. Though 1-inch board would not give you as high an R-value, it would still provide a thermal break, and it may be easier to blend into the home's appearance with a protective covering.

As far as depth is concerned, the above-grade portion of the slab and foundation has the largest temperature difference between the inside and outside, so that area benefits the most from being insulated. Below grade, the difference in temperature diminishes as you go deeper into the ground. Cover the entire exposed area of the foundation and extend the insulation at least 18 inches into the ground.

If you apply insulation to the outside of a foundation, please note that rigid insulation and its protective covering can provide concealed access for insect infestation. Cover the top of the insulation board with a material such as metal flashing and seal that against the foundation to create an impenetrable barrier.

### Preventing Heat Loss From an Uninsulated Slab





I need to attach a deck to a home with an I-joint floor system. Can I attach the ledger to the engineered-wood rim joist?

**A** Mike Guertin, a builder and remodeler in East Greenwich, R.I., and a presenter at JLC Live, responds: If

the rim joist is structural—in other words, designed to transfer compression loads between the subfloor sheathing and the mud-

sill or plate below—then a deck ledger can be attached to it. The American Wood Council's "Prescriptive Residential Wood Deck Construction Guide" (DCA6) contains a prescriptive ledger-fastening table (Table 5), similar to the one in the IRC, that includes spacing requirements for attaching a deck ledger to 1- or 1 1/8-inch engineered-wood rim boards with 1/2-inch lag screws and 1/2-inch through-bolts. Manufacturer prescriptive ledger tables for proprietary structural ledger screws—such as FastenMaster LedgerLok (fastenmaster.com), Simpson Strong-Tie SDWH and SDWS (strongtie.com), and GRK RSS (grkfasteners.com)—also list engineered rim-board types. Most building officials will accept the DCA6 as well as manufacturer's tables for connecting ledgers to an engineered rim board.

But not all engineered floors are framed with structural rim boards. When I was framing floors with I-joints in the late 80s, engineered rim board was not available, and we closed the rim with either an I-joint or 3/4-inch plywood ripped to the I-joint height. Deck ledgers cannot be attached to these I-joints or nonstructural plywood rims.

If you can view the rim board from inside the house, you may be able to find spray-on labeling that identifies it as structural. Otherwise, to determine whether a rim joist is structural, drill a 1-inch-diameter hole—in a location that can be flashed over if needed—all the way through the rim board to ascertain its thickness. If it is 1 inch or 1 1/8 inches thick, it's considered structural and you can proceed with fastening the ledger according to the tables mentioned above.

If the rim closure is nonstructural, however, the simplest solution is to construct a freestanding deck—set footings, posts, and a beam 1 foot or so from the house to bear the deck load ordinarily carried by a ledger. If a freestanding deck is not a viable option, the best alternative is to have an engineer design the ledger attachment, and have that approved by your local official.

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**Q** I'm doing a remodel on a home that is currently heated with steam radiators. The boiler is fairly new, but I'm wondering if I should stick with steam or convert to hydronic? And if I do keep the steam system, should I upgrade to newer radiators or keep the old, bulky, but classic-looking ones?

**A** Keith Cappuccio, a licensed plumber in New York City, responds: Steam is a time-tested method of heating a home. Although it's not as versatile as hot water (hydronic) heat, when installed correctly steam should provide decades of relatively maintenance-free operation. When asked about the feasibility of converting a steam system to a hydronic one, I usually point out the following items for general consideration.

First, many steam systems are one-pipe systems, with only a supply pipe and no return, so it might not be possible to re-use the existing steam pipes to circulate water

through the house. Running new pipe would not be a problem if you are gutting the home's entire interior. If you aren't, though, you can anticipate having to remove and refinish a significant amount of plaster and trim to run those new lines, even though trusted PEX brands can be fished through the house more easily than the copper pipe of 20 years ago.

Next, hydronic systems use more pumps, valves, and relays than a steam system, so maintaining a hot-water system over the years may prove to be more parts-and-labor intensive.

But hydronic heat has its benefits. It is very versatile and can be used for radiant,

baseboard convectors, or freestanding radiators—all in the same system. Plus you can combine a solar water heater with the boiler for a super-efficient design.

My advice? If the work you're planning to do is more cosmetic, stick with the present steam system. If the house will be gutted, however, consider re-using the boiler block as a hot-water unit and install a radiant manifold with 3/8-inch PEX lines traveling individually to each radiator. The supply manifold includes balancing valves to control the temperature of each heating circuit. You'll get a classic look, while saving money on radiators and a new boiler.

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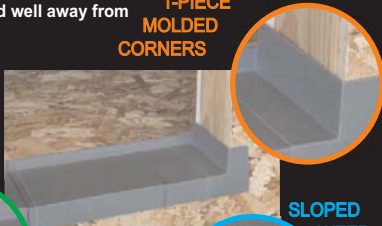
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Skylights

BY JOSH PIPER



## Basement Stairs Transplant

**We renovate kitchens** quite often, but I've rarely seen a renovation as dramatic—and yet as simple—as one that we completed recently (1). The key to the renovation was relocating the basement stairs. The house was originally built with the stairs to the basement and the stairs to the second floor in two completely different locations, most likely to provide a more direct route from a nearby breezeway door to the basement. The basement stairwell interrupted traffic flow to the front door and turned the kitchen, dining room, and living room into spaces that felt cramped (2). Stacking the two staircases allowed us to open up the entire space while creating a roomy kitchen.

In the original floor plan, a hallway ran behind the kitchen to access the basement stairs (see illustration, next page). A truss roof directly above that section of the house meant that the interior partitions were non-struct-

tural, so first we removed the walls that separated the hallway and kitchen. Then we tore out the chaseway walls, exposing the stair hole while leaving the stairs—the only convenient access to the basement—in place (3).

Before removing the old stairs, we prepared the space for the new ones. The original stairs stepped down to a landing and turned right 90° before continuing down to the basement slab. A closet occupied the space under the existing stairs to the second floor, so we were able to use the same configuration for the new basement stairs: a step down to a landing within the footprint of the closet, a 90° turn to the right, and then a straight run down to the basement floor.

The closet door opened into a room adjacent to the living room. That opening would eventually be walled off, and the access to the new basement stairs would be from a hallway on the opposite side of the closet. To

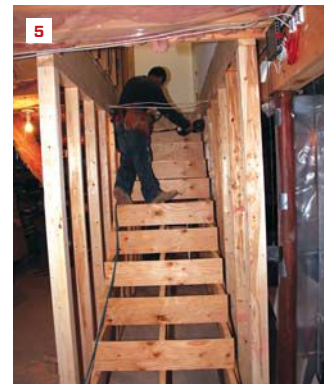
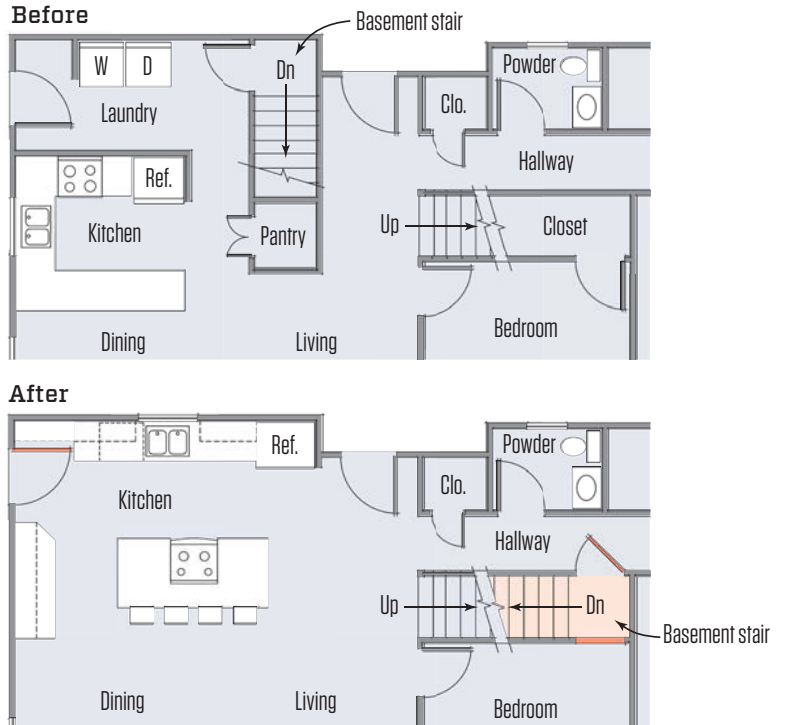
confine the mess, we worked from the existing doorway and did not open up the new access until the stairs had been moved. Before we could cut the new opening in the closet floor, we had to relocate heating return ducts and frame the opening.

In the basement, we framed simple 2x4 walls for both sides of the new stairway. These walls were supposed to be continuations of the closet walls above (4). We positioned one wall close to the center beam, in plane with the wall above. But after measuring the width of the closet, we realized that the opening was too narrow for a code-compliant stair. To fix the problem, we positioned our other basement wall at the proper stair width, out of plane with the closet wall above. Then we stripped the drywall from that side of the closet, letting the studs overhang the wall and the framed opening below by an inch. After the stairs were installed we went back and ripped an inch from each of the studs with a reciprocating saw and a circular saw. This essentially created a 2x3 wall, but now the opening was wide enough for a code-compliant stair.

One of the new basement walls supported the ends of the floor joists that had to be cut for the new stair opening, so no special framing was required. We capped off the ends of the joists with 2x10s to finish framing the opening.

Basement slabs are notorious for being out of level, so next we measured the total rise of the original basement stairs and the total rise of the stairs at the new location. Fortunately they were almost exactly the same. That meant that the original stringers would work for the new stairs. Armed with that information, we built and installed the landing for the new stairs out of 2x8s. The original 2x10 treads had cupped and twisted over time, so we made new ones with 3/4-inch-thick Advantech engineered floor sheathing ripped to the proper tread depth. We sheathed the landing with the same material.

The old stringers were in good shape, so we removed them carefully to be reused. Because we were reducing the tread thickness by 3/4 inch, we needed to raise the height of the stringers by the same distance. The stringers were kiln-dried lumber, so we



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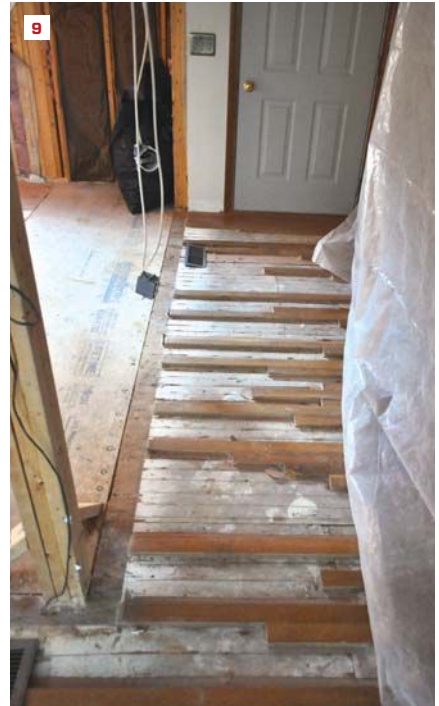
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## On the Job / Basement Stairs Transplant

attached a strip of 3/4-inch pressure-treated lumber to each stringer, raising them the proper distance and protecting them from contact with the concrete.

After hanging the stringers, we installed solid risers made from CDX plywood (5), then glued and nailed the new treads to the stringers (6). Where the old stairs had been removed, we filled in with joists as needed (7), then glued and nailed Advantech floor sheathing over the opening (8). To extend the existing strip flooring into the new kitchen space, we spliced in new flooring (9), which the flooring contractor did a masterful job of staining to blend old with new. In the end, the relatively simple task of relocating the basement stairs allowed us to create a larger and more functional kitchen, while integrating the kitchen, living room, and dining room with the main entry of the house in a wonderfully wide-open space.

*Josh Piper is a project supervisor for Kurzhaus Designs (kurzhaus.com) in Harwich, Mass..*



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## Working With Roxul Insulation

BY LEE MCGINLEY

**Choosing insulation** for a high-performance home in Northern Vermont—where temperatures as I write hover around the zero mark—requires thought and care. The right choice can make a huge difference in both comfort and cost efficiency.

I did my research and was leaning toward the most popular choice in our area—dense-packed cellulose—when I discovered Roxul ([roxul.com](http://roxul.com)), a new/old product by a Danish company. The material I can get locally is manufactured in Canada, and it's gaining popularity in this region—so much so that it's now carried here in one of the big-box stores.

### ROCK WOOL REVISITED

As the name implies, Roxul comes from rock that is spun like wool (“ul” is the Danish word for wool). The material is volcanic rock mixed with iron slag (slag is the collection of compounds that are melted off and removed during smelting, when iron ore is exposed to high temperatures).

Something about this product seemed familiar. I remembered that when I was a kid in upstate New York, my parents used “rock wool” to insulate exterior walls during a remodeling job at our house. In those days, it came loose in batts encapsulated in Kraft paper and was stapled to studs.

Today's Roxul is pea-soup gray in color and comes in boards and batts. ComfortBoard is a rigid board used chiefly for exterior insulation in commercial applications. ComfortBatts hold together without a Kraft-paper or other covering (although they will come apart if they are tossed around on the jobsite too much) and are used for residential construction. I settled on the batts for my own house.

### APPEALING PROPERTIES

I learned that, apart from my key considerations of R-value and cost, Roxul has some very appealing qualities. Among them are the following:

- It doesn't burn.

Photos: Lee McGinley



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- It repels water.
- It won't support mold growth.
- Its density results in a quieter home.
- It's easy to install.
- Density is consistent, not installer-dependent.

The last two points were especially significant. Since my crew and I could install the Roxul ourselves, I would not have to hire or accommodate the schedule of a specialty sub. And whereas with dense-packed cellulose, the skill of the installer and job-site conditions can affect the uniformity—and therefore quality—of the end-product, Roxul's density is uniform from the factory, regardless of who installs it.

#### R-VALUE—THE CRITICAL FACTOR

I built my house with double-stud wall framing that has 10 ½-inch wall cavities into which I could place three layers of 3 ½-inch Roxul. Photo (1) on the previous page shows my double-wall assembly, with an outer and an inner 2x4 wall separated

by a 3 ½-inch space. Staggering butt joints from course to course, I placed the first and third layers vertically and the middle layer horizontally.

Each 3 ½-inch batt has an R-value of 15, meaning that my total cavity insulation would be R-45. Dense-packed cellulose would have yielded R-38. (Fiberglass insulation, which I didn't seriously consider, has to be about 15 inches thick to achieve a comparable R-value.)

There are eight 3 ½-inch batts to a bag, which covers 60 square feet, and because each bag of Roxul was wrapped in a heavy plastic film, I could leave it outside without worrying about rain or snow damage (2). Detailed, illustrated installation instructions are also printed on the wrapper.

If you need other batt sizes, Roxul is available in 5 ½-inch and 7 ¼-inch batts with R-values of 23 and 30, respectively. The company also manufactures "Safe 'n' Sound," which reportedly has greater fire resistance and sound absorbency than its other insulations.

#### CUTTING BATTS TO SIZE

We discovered that the batts can come apart if they're tossed around. They're not fragile but it helps to keep this in mind when handling them. And although Roxul isn't itchy like fiberglass, the manufacturer recommends wearing gloves, eye protection, and a dusk mask during installation.

To cut the batts, a long-bladed knife, rather than a utility knife, is recommended because they are dense. And because Roxul is spun rock, the cutting knife needs frequent sharpening. A serrated bread knife works well, but what worked beautifully for me was a \$15 electric carving knife (3). This knife also allowed me to shave off narrow strips easily. This was helpful for a narrow bay or when my first cuts proved to be too long (4).

I created a cutting table by stretching a couple of plywood ribs over sawhorses and simply ran the electric knife down the middle (5). For narrow pieces, I hung one edge of the batt beyond the plywood, and carved off what I needed.

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When I cut pieces to length, I cut them  $\frac{1}{4}$ - to  $\frac{1}{2}$ -inch longer than my measurement to ensure a tight fit. I laid out my measurements and with a 4-foot level connected my references, creating a straight line to cut along. Surprisingly, I was able to draw a legible line on the ComfortBatts with a black permanent marker.

The house has four different window sizes. I pre-cut batts to match the heights of the wall cavities above and below the windows, and cut the batts to width as I placed each one. I sped up installation further by pre-cutting widths for several full-height bays at once.

With many narrow bays and cuts around windows, there could have been a lot of waste, but because Roxul is self-supporting, I was able to recycle the drops, butting and stacking them to fill cavities.

Squeezing any fibrous insulation behind electrical boxes is not a good idea, so we cut around the boxes. For wires, we scored the Roxul and inserted the wires into the grooves. For plumbing pipes, we made a

V-groove to accommodate each one (6), always keeping the pipes to the warm side—the inner wythe of my double-stud wall framing served as a utility wall (7).

#### INSTALLING BATTS

Roxul's batts are intentionally  $\frac{1}{2}$ -inch wider than a typical framing layout. Batts for 16-inch on-center framing, for example, are 15 inches wide, rather than  $14\frac{1}{2}$  inches. Batts for 24-inch on-center framing are 23 inches wide, rather than  $22\frac{1}{2}$  inches. To place a batt, we inserted it between cavity studs while compressing its sides slightly, then released it. The result was a nice, snug fit.

Installation went quickly. For example, for a second-floor installation, I was able to install the first layer of Roxul on 1,200 square feet of exterior wall—cutting around 16 windows—in approximately 12 hours. This included lugging the 12 bags upstairs, vacuuming the bays, and sweeping up afterward.

Like any fibrous insulation, Roxul does

not stop air, so we were careful to air-seal with rigid board at critical areas, like the band joist, before packing out the wall with Roxul (8).

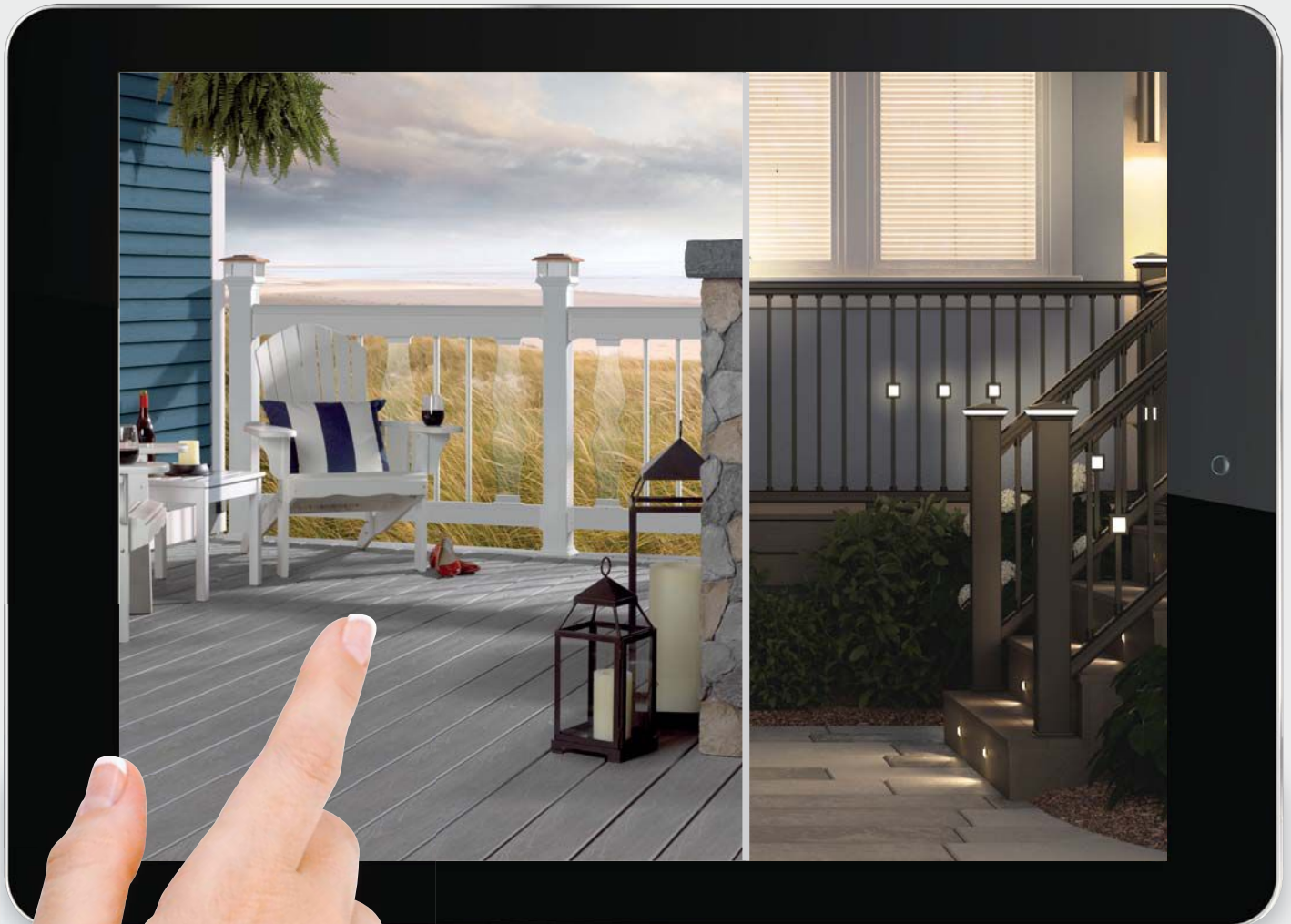
#### BOTTOM LINE

The lowest quote I received for filling a 10  $\frac{1}{2}$ -inch cavity with dense-packed cellulose was \$3.88 per square foot, including netting. With Roxul, using three 3  $\frac{1}{2}$ -inch batts would set me back \$1.68 per square foot plus labor, which ran about \$1 per square foot. My installed cost for Roxul, therefore, was about 70% of the cost of dense-packed cellulose.

Another way of looking at the value is as R-value per inch. At R-38, dense-packed cellulose comes in at around 10 cents per inch per square foot, while Roxul weighs in at 5 cents. Both of these costs include labor.

*Lee McGinley is a Certified Passive House Tradesperson and designs and builds high-performance homes. He lives in Addison, Vt.*

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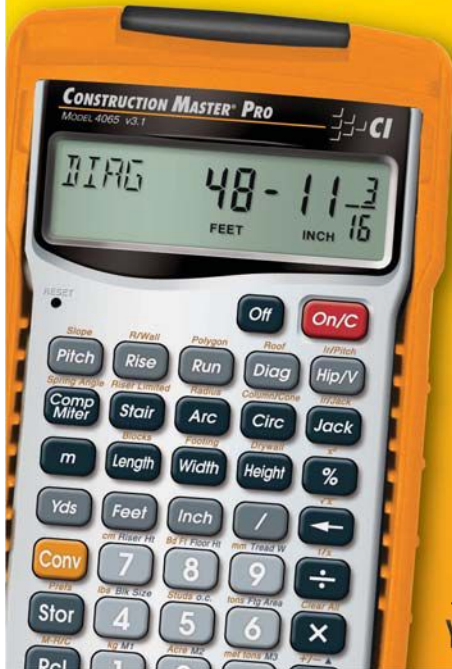
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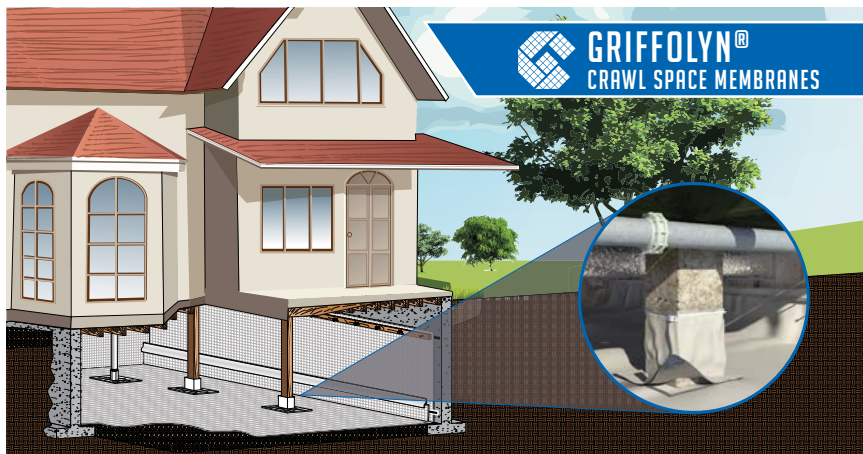


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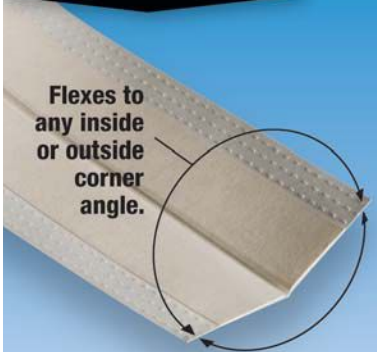
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BY APRIL WILSON

## Author Rank and SEO

These days, Search Engine Optimization is focused on depth of expertise and valuable content. The meta-tags and HTML code that live behind your website are no longer of key importance to search engines—in fact, it can actually hurt your ranking if you haven't changed your SEO strategy to reflect the new focus on subject matter expertise. In this article, we'll look at another important component of a solid SEO strategy: author rank.

### WHAT IS AUTHOR RANK?

Author rank is a phrase originally used by Google+ to denote a person who has published content on multiple quality websites. The premise is that if you are truly a subject matter expert on a certain topic, you are asked to write about that topic for high-traffic, high-quality websites. In Google+, you can showcase your subject matter expertise by adding to your profile (under Profile, Links) the websites for which you contribute content. Remember, Google will crawl these websites to validate that you

have contributed content to them. To be considered a current contributor, make sure you have published in the last six months on any websites you list.

### HOW AUTHOR RANK WORKS

Your Google+ ID is a long string of numbers associated with your profile. Think of it as your Google Social Security number. This number is associated with all the content you post—so if you do contribute to several websites, you will want to make sure they are including your Google+ ID in their code (it looks something like this: /110412540089011112345).

Most people don't understand Google+ because it's not as popular as Facebook and other social sites. You may have to educate the websites where you post content to make sure they include this snippet of code on all of your work: `<rel="author" link="your-googleplus-url" />`.

### THE AUTHOR RANK IMPACT ON SEO

In addition to considering them a more "trustworthy" source, Google will rank articles authored by experts higher in the search results pages than articles by unknown authors for the same keywords or topics. A side bonus is that the author's photo appears with the search results, which tends to produce higher clicks in many usability click tests.

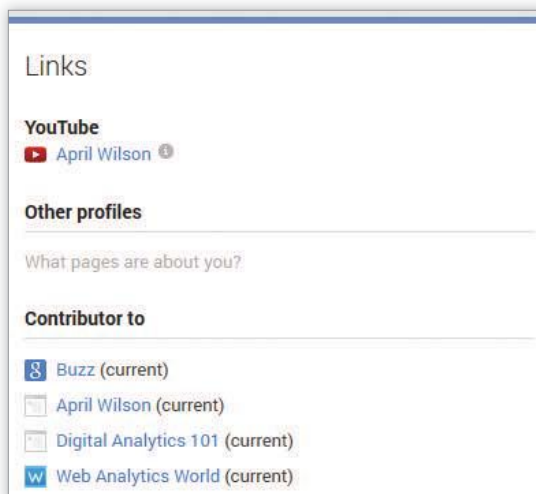
It's not just Google, either. Not to be outdone, Bing has partnered with an authority ranking website called Klout. If experts answer questions on Klout, their Bing ranking improves by default. The same principle also applies to Yahoo! If an author contributes to any of the Yahoo! content sections, Yahoo! will automatically rank that author higher in the search results.

### THE TAKEAWAY

If you have subject matter expertise in a certain area, the first place you want to post it is obviously to your own website so that you can grow your database and interested lead lists. However, the next step is to look for other authorship or expertise-sharing opportunities to improve your own website's SEO.

*April Wilson is CEO and president of Digital Analytics 101 (digitalanalytics101.com), an online marketing company. april@digitalanalytics101.com*

To improve your author rank, edit your Google+ profile to include a list of websites for which you provide content (right). Adding your Google+ ID to your content means your image will display in search results (below), which tends to produce higher click rates.



[I've been working on polishing off my personal website and doing ...](https://plus.google.com/110412540089011126948/.../Jd67ruT...)



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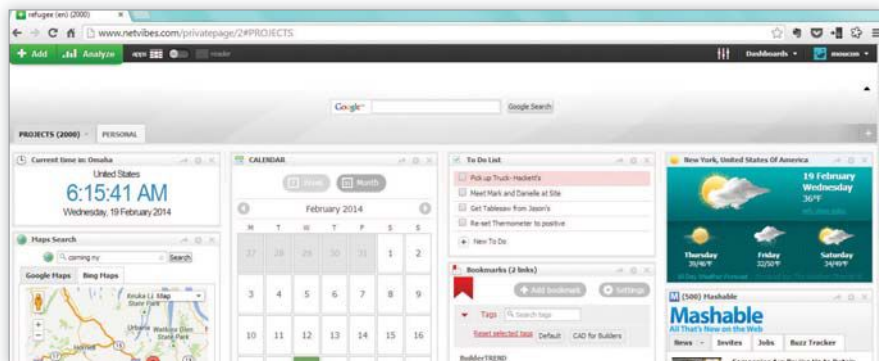
## Personal Dashboard

BY JOE STODDARD

**Nothing is handier than** having the information that you need to get through the day available on a single, organized screen on your computer or tablet. Conventional software, like Microsoft Office and QuickBooks, has been offering this “dashboard” view for a long time. But now, thanks to the “cloud,” you can build your own dashboard to consolidate all kinds of information—from your calendar, email, and to-do lists to weather and news from the Internet. Having it all on one screen can save you hours of surfing to different websites and blogs to find what you’re looking for.

For years I relied on iGoogle to help contractors create their personal dashboards. Unfortunately, Google discontinued the free service last November, leaving us scrambling. I’ve located a half-dozen good alternatives that do pretty much the same things in pretty much the same way iGoogle did. But there are subtle differences (like the ability to share a page with your clients or subs, for example) that may make you choose one over the others.

Enter a topic keyword into Netvibes (right) and it scours the Web to find matching content. Netvibes can create a dashboard layout (below) similar to that of the old iGoogle.



### A GOOD DASHBOARD

I looked for iGoogle replacements that had most, if not all, of the following features:

- Free service (usually ad-supported) and an optional paid version without ads;
- Multiple pages or tabs—such as Productivity, Business, and Personal—organized however you want;
- Multiple ways to display information on the same page (for example, gadgets, widgets, and older-style RSS feeds);
- Customizable look and feel (user can change colors and fonts, and the size and location of the gadgets or widgets);
- At least near-real-time information that automatically refreshes as new information becomes available;
- Ability to work in all major browsers, including those on phones and tablets;
- Ability to make some pages public (for sharing with clients or subs), while keeping others behind a password.

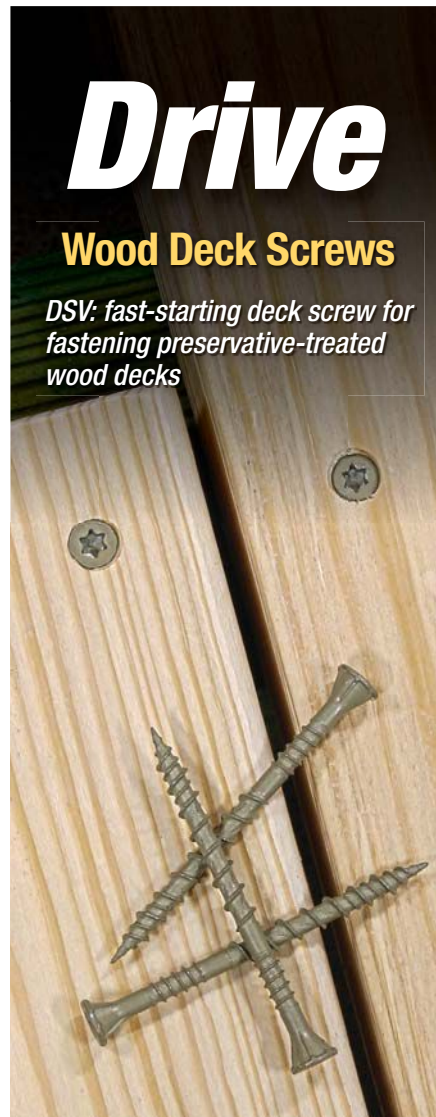
### NETVIBES

This dashboard is a spin-off from the

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# Drive

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company's core reputation-management business. Instead of creating pages one widget at a time, you simply type in the topic you want to follow and Netvibes does the rest, scouring the Internet for whatever information it can locate and organize on that particular topic (see screen shots on previous page). From there, you can edit your pages, changing the content, theme, and layout to your heart's content. Netvibes also has extensive options for sharing your pages by email or on social media. Free; \$3.50/month with "VIP support." Premium version (\$499/month) manages all social media and other Web activity. [netvibes.com](http://netvibes.com)

### MY YAHOO

The simplest of the free-with-ads options, MyYahoo (1) is geared toward people who are already using Yahoo mail, address book, or calendar. There is no paid version, so you're always stuck with an ad in the upper right-hand corner of your page (which even the best ad-blockers would not nuke). Yahoo makes it easy to create additional tabs and organize feeds any way you like, but the "Add Content" button limits you to categories Yahoo makes available. My Yahoo is strictly private—there's no way to share content unless you give up your password (bad idea). Free with ads; no paid version. [my.yahoo.com](http://my.yahoo.com)

### STARTME

In addition to using dedicated one-topic widgets, StartMe (2) also lets you add widgets containing RSS feeds or URL Lists, then reorganize everything on the page. The drag-and-drop interface makes it easy to create public or private pages, each of which can hold different content. For example, you could set up a page with links to your preferred product manufacturers and make that available to clients and prospects. But you can also create a private page to hold your personal email and social media accounts. StartMe also lets you add productivity widgets, such as your calendar and to-do list. Free; no paid version. [startme.com](http://startme.com)

### PROTOPAGE

This dashboard is my current favorite, mostly because it's so configurable (3). It's the only service in this bunch that allows you to change not only the location of a specific widget, but also its width. If you need something wider so you can read more of it without scrolling (your email, for example), it's no problem. Unlike with the other services mentioned here, you're not locked into pre-set columns—widgets and gadgets spanning multiple columns can intermix with single-column versions anywhere on the page. Free with ads; \$2.49/month without ads. [protopage.com](http://protopage.com)

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Like Netvibes, BlueG helps you out by setting up your initial pages for you based on some selections you make when you first sign up. BlueG is free, but you'll have to put up with at least one shopping gadget (Amazon, for example) on each page. BlueG maintains a gadget library, including a "By Google" category that claims to have all your old, favorite iGoogle gadgets waiting for you. BlueG hints (but never outright admits) that the "Google" gadgets were created by the old team of Google gadget developers. Free (shopping gadget can be deleted). No paid version (but donations encouraged). [blueg.com](http://blueg.com)

**IGHOME**

This dashboard, whose name stands for "iGoogle-Home," was created by Mike Sutton, an iGoogle gadget developer who wanted to re-create the iGoogle experience

for himself and others (4). The service is free, but there is a link for a PayPal donation at the bottom of the page. In the same way that My Yahoo is geared toward Yahoo users, igHome is geared toward Google Drive/Apps users, with links to most popular Google services (Gmail, Drive, YouTube) available across the top of the interface. Not surprisingly, of the dashboards in this article, igHome is closest to the old iGoogle in terms of features and functionality. For those of you who want to replicate your old iGoogle pages exactly or just need more help organizing your igHome setup, there is a comprehensive set-up guide independently maintained at [saveigoogle.org/going-home-ighome](http://saveigoogle.org/going-home-ighome). Free with persistent PayPal donation link. [ighome.com](http://ighome.com)

*Joe Stoddard consults with contractors about technology. [jstoddard@mountainconsulting.com](mailto:jstoddard@mountainconsulting.com); [twitter.com/moucon](https://twitter.com/moucon).*

**/HR/****Have Job, Will Travel****WHAT HAPPENED**

Good Guys Construction Co. allows employees to travel to the shop the night before to pack the tools and supplies they need for the next day. That way, employees can drive from their homes directly to the jobsite in the morning. Employees are not paid for their evening travel time to the shop; they are paid from the time they arrive at the jobsite to the time they leave. All employees have agreed to this policy.

**WHY IT'S WRONG**

When employees travel from home directly to the jobsite, they are not required to be paid for this time. This is the case with the morning commute of Good Guys Construction's employees from their homes to the jobsite. Where Good Guys Construction violates Wage and Hour regulations is in how they handle the time employees spend in the evening

driving from the jobsite to the shop. Since employees are not leaving the jobsite to go directly home but are instead first stopping at the shop, this time would be considered hours worked and needs to be paid. Once the employee leaves the shop to return home, driving time would be unpaid.

**WHAT YOU SHOULD DO**

Carefully review your hours worked and payroll procedures. Understand that travel time during the regular workday typically needs to be paid, unless the employee is directly leaving from or returning to home. Even if employees agree to another arrangement that is contrary to Wage and Hour regulations, the Department of Labor will enforce this law.

*Douglas Delp is founder of The Delp Group ([delpgroup.com](http://delpgroup.com)), which provides human resources services to small businesses.*

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BY BILL LEYS



## Scuppers and Drains for Waterproof Decks

**My company specializes in installing** waterproof decks, but I often also get calls to fix existing decks that are leaking or coming apart. Many times, these jobs are familiar. They are ones we had bid on to build originally, but didn't get—probably because we had priced the jobs to use the best materials available and install them correctly.

The worst dry-rot damage we see usually occurs where drains and scuppers penetrate a deck. We do see some problems with drip edges on open decks, but not as many, as edge flashings aren't subjected to as much water as drains and scuppers are.

A deck enclosed by parapet walls is essentially a big bathtub that drains to a scupper or floor drain. The whole deck surface is supposed to be pitched toward these exit points, and over time a slow leak can lead to some pretty spectacular dry-rotted framing. I've seen fungus, mushrooms, and even worms behind leaking decks and walls.

### SCUPPERS

Photo (1) above shows significant damage to wood framing from water intrusion at a through-wall scupper. Poor or missing details—including a lack of exterior counterflashing over the scupper and poor installation of the weather-resistant barrier—allowed water to leak in from the exterior side. In addition, the scupper was initially installed with the drain-end of the tube higher than the deck. This caused water to pool in front of the scupper, and eventually that water seeped in past the poorly applied deck coating and around the scupper.

For this repair, the customer insisted on our using copper flashings. We will use copper only if requested and only if the clients sign a waiver against coating failures, because even when copper is installed correctly, coating failures are possible. The characteristic green tint that makes copper so attractive for finish applications forms when acids in rainwater and pollutants in the air come in contact with exposed copper



surfaces. This reaction happens even more quickly in salt air. The patina eventually creeps under the polymer waterproofing and causes it to debond.

Besides copper, we use two other materials to flash decks: stainless steel and “bonderized” steel. Stainless holds up in salt and urban environments but requires a careful sanding with 80- to 120-grit paper first. When the client can afford it, we use 28-gauge, 316-grade stainless because it holds up better than the 28-gauge, 304-grade stainless we more commonly use. But 316 is a much harder metal; bending a profile on it is more challenging, and sanding or grinding the surface so that a coating will adhere to it is time-intensive. Also, 316-grade material is so hard that it can't be nailed by hand or with a pneumatic nail gun. It must be pre-drilled and screwed, whereas 28-gauge 304 can be

nailed with a conventional coil nailer.

The most common metal we work with is phosphated, or bonderized, steel. This is a form of galvanized steel that has been put through a phosphate bath to clean the surface of oils and contaminants, allowing our coatings to bond to it easily. We do not use the shiny galvanized flashings commonly seen at the big-box stores, because they are protected with a thin layer of oil that causes bonding issues for liquid and cementitious coatings. Before using these flashings, you would need to weather them for six months or so outside, or else etch the surface with acid, which is difficult to do properly or safely on site. With a bonderized flashing, however, there is no prep work to prepare the flashing for our coatings other than cleaning off any dirt or dust.

Regardless of the flashing material chosen, it's critical to integrate the scupper as-

sembly with L-flashings and the deck waterproofing materials. Note in photo (2) that the L-flashing laps over the scupper flanges and that these laps are bedded in a polyurethane caulk.

Prior to applying our primer and waterproof top coating, we sand the interior of the scupper to promote adhesion of the coatings to the metal. This prevents the coating from debonding as the copper oxidizes, as it has on the scupper in photo (3). We then prime the scupper and lap on a cementitious or epoxy waterproofing when we finish the deck. Coating a copper scupper with the decking materials isolates it from air and water, helping to prevent the reaction that takes place with uncovered copper. But the copper is still vulnerable at exposed edges, which is the reason we require a signed waiver.

We counterflashed the exterior side as a

THE

# TS 55 REQ

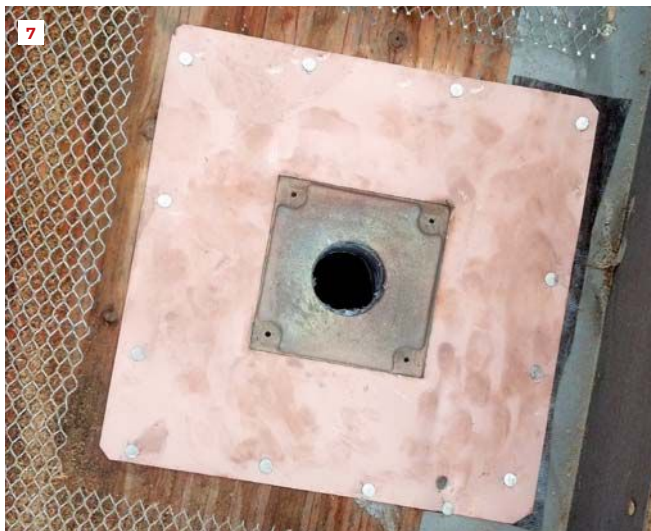
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best-practices method (4). We nailed it at the top, but not at the bottom so the contractor installing a water-resistant barrier can slip that layer under the shield and trim his paper down over the front of the shield, providing a highly leak-resistant barrier.

## DRAINS

Leaks at drains often occur because the original contractor had used the wrong assembly, such as a toilet closet flange (5) or a plastic shower drain (6). Neither type can be integrated with deck waterproofing materials. Instead contractors usually just pump a lot of caulk around them and hope for the best. Eventually they leak.

We replaced both of those drains with commercial deck-drain assemblies, like the ones shown above (7, 8) from Thunderbird Products ([thunderbirdproducts.com](http://thunderbirdproducts.com)). The wide copper flange can be integrated with

layers of waterproofing, and because this flange is never exposed to the elements, it won't oxidize, so the polymer bond stays intact over time.

To prevent galvanic corrosion, care needs to be taken to isolate the copper flange from the metal lath that is commonly used with cementitious waterproofing systems. The copper flange is first coated with primer—a diluted mix of the polymer additive used for the cementitious waterproofing. Then we cut and fit metal lath around the flange without allowing the two metals to touch (7). We bridge between the flange and lath with glass fiber reinforcing mesh, such as Dryvit's Panzer mesh. If bonderized steel L-flashing laps the copper drain flange, the two metals should be separated with a peel-and-stick membrane. Ideally, L-flashings should lap over the drain flange, but in retrofit repair work we will sometimes com-

promise if the existing flashing is in good condition and we feel we can successfully waterproof it.

We secure the lath and reinforcing mesh with 1-inch-crown stainless steel lathing staples (9). We nail-off the flange with 1/4-inch stainless steel ring-shank coil gun roofing nails, which provide considerably more holding power than the cheaper smooth-shank roofing nails (10). Stainless fasteners are hard to find in my area; we order them online as we need them from Fastener USA ([fastenerusa.com](http://fastenerusa.com)).

When we are satisfied with the preparation and installation of our drains or scuppers, we can then set about installing the rest of the waterproofing system (11).

*Bill Leys is the owner of Central Coast Waterproofing in Arroyo Grande, Calif., and a regular presenter at JLC Live.*



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## Laying Out a Tile Floor

Proper layout doesn't just mean a good-looking floor; it can save you material and installation time as well

BY MICHAEL BYRNE

My education in layout began in a large manufacturing and repair shop for machinery. For six months, I was apprenticed to a layout specialist who taught me how to plot accurate layout and machining lines on rough iron castings. Almost 45 years later, I still use the skills I learned on rough castings, applying them to the not-so-perfect floors, walls, countertops, and ceilings I have to cover with tile. Most layouts are simple, with only a few lines required to guide the tiles; but some can be quite complex, requiring a lot of thought, patience, and time to plot.

For tile installation, I use the term “layout” to refer not just to a set of chalk lines, but also to an entire systematic process. Whether the job is simple or complicated, there are two main goals behind the layout process. The first is to provide an accurate framework of chalk, pencil, or laser lines to guide the placement of tiles. The second is to improve the efficiency of the installation by eliminating unnecessary steps. In this article I will concentrate mainly on layout techniques for floors, but I use many of the same principles and tools for any tile layout.

## Recommended Setting Bed Flatness

Tile Size	Surface Tolerance (longest dimension)
Up to 10 inches	¼ inch in 10 feet
10 to 16 inches	⅛ inch in 10 feet
16 to 24 inches	⅙ inch in 10 feet
Over 24 inches	⅓₂ inch in 10 feet

In this table are the recommended tolerances for how much a floor can vary from being perfectly flat, based on the size of the tile. Measurements are taken using a laser level or a long straightedge, and a measuring tape.

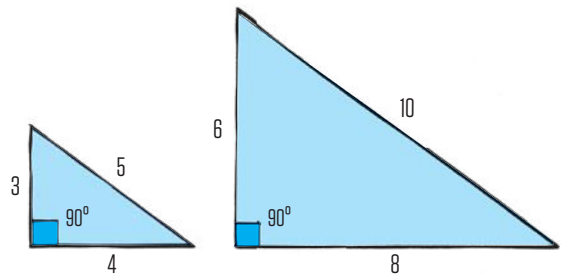
### CHECK THE FLOOR FOR FLAT AND LEVEL

For all tile layouts, including floors, I depend on a few tools: An accurate measuring tape, a framing square, a large 3-4-5 folding square, straightedges, a chalk line, and a laser square. I check all these tools regularly for accuracy.

Before lasers arrived on the scene, I checked for flatness using 5- and 10-foot straightedges. This method is accurate if done carefully, and I still often use it on jobs of around 100 square feet or less. To check a floor manually, I use a straightedge and spirit level to determine if the surface is level and if it is flat enough for the size tile I'm installing (see Recommended Setting Bed Flatness, above). For floors larger than 100 square feet, I use a 10-foot straightedge because it corresponds to the industry standard of flat to within ¼ inch in 10 feet. If there are any gaps greater than ¼ inch between the straightedge and the surface, I know instantly that it is off-spec. For dimensions shorter than 10 feet, I use a 5-foot straightedge and look for gaps greater than ⅛ inch. I can use the same straightedges to check for the tighter tolerances that apply to larger tiles.

The pattern I use to check for flatness is simple and straightforward. I start by holding the straightedge against the floor, about one foot from the base of the wall, checking with the straightedge every foot across the length of the floor. After checking the floor in one

## 3-4-5 Triangle Determines Square



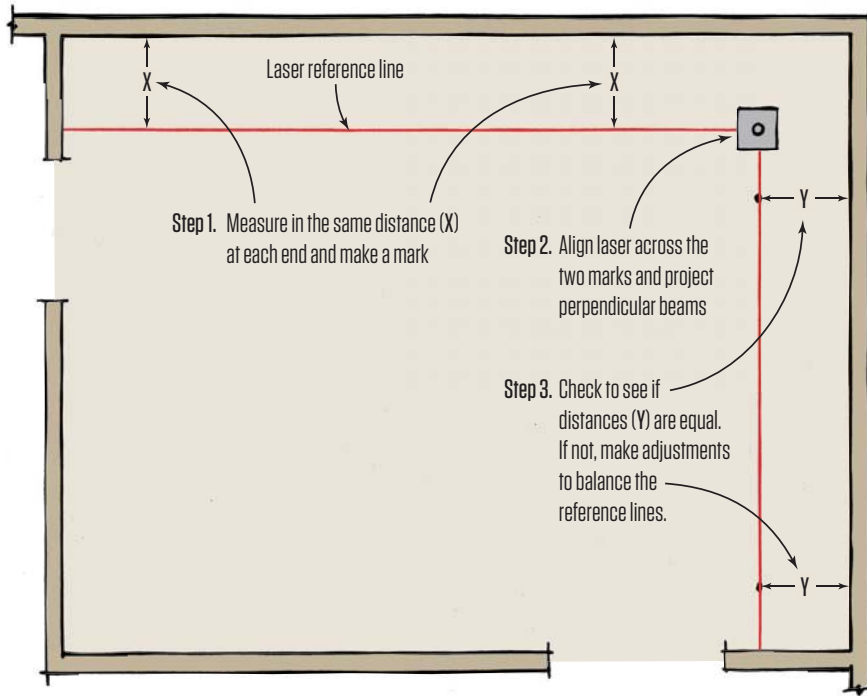
**(1)** A triangle whose sides are in the ratio of 3:4:5 will have a 90° angle, according to the Pythagorean Theorem. Multiples of this right triangle can be used to plot reference lines or to check lines plotted by a laser.

direction, I rotate the straightedge 90° and repeat the steps above to check the floor in the other direction. Using a spirit level with the straightedge lets me check for level at the same time. The industry minimum standard is level to within ¼ inch in 10 feet, but there can be exceptions either way. While I have the straightedge in my hands, I also check the walls around the perimeter of the floor for straightness. If the wall has a bow or waviness, I will have to compensate for it in my layout.

Though I still rely on straightedges and spirit levels during installation, they are tedious, cumbersome, and inaccurate when laying out large residential and commercial floor projects. Contractor-grade cross lasers (both horizontal and vertical beams) have taken a lead role in speeding up the work; lasers can significantly reduce the amount of time an installer spends measuring a surface, plotting layout lines, and checking tile alignment.

When I need to check a single- or multi-room floor layout for level and flatness, I use a laser and note changes in elevation by reading the laser's beam off a measuring tape. With a minimal number of setups, I can assess several rooms in just a few minutes. With this information, I can adjust the tile layout to downplay any problem areas or determine if corrective measures are needed for surfaces that are off-spec.

## Establishing Floor Reference Lines



**(2)** The first lines to plot when laying out a tile floor are perpendicular reference lines. Measure an equal distance (X) from each end of the longer wall and align a laser with these points. Then measure distances Y; if they are equal, the room is square. Otherwise, the lines may have to be adjusted for a balanced layout.

### CHECK FOR SQUARE

A floor that is level and flat can still be out of square. This will not affect the performance of the floor, but unless the tile is skillfully laid out, the finished installation may not be attractive.

To check for square, I plot two reference lines 90° to each other. I use a variety of mechanical and laser tools, but when checking a floor for square or when plotting reference lines for a layout, I prefer to use a laser square because of its speed, simplicity, and accuracy **(2)**. First I mark the floor at equal distances (X) from one wall, near each end. I align one laser beam across the two marks. Then I measure from the perpendicular laser beam to the other wall (Y).

The next step is balancing the reference lines. I make the first two measurements on the longest exterior wall, or on the longest interior wall if no side of the floor runs along the exterior. The reference lines are about one foot in from the wall for convenience—the exact distance doesn't matter. Taking measurements every foot or so, I can quickly see how close the floor is to square and make adjustments to the reference lines as needed.

The goal is to balance the reference lines in a way that helps to mask problem areas resulting from one or more sides of the floor not being straight or square. The adjustments involve shifting the reference lines one way or another by rotating them slightly

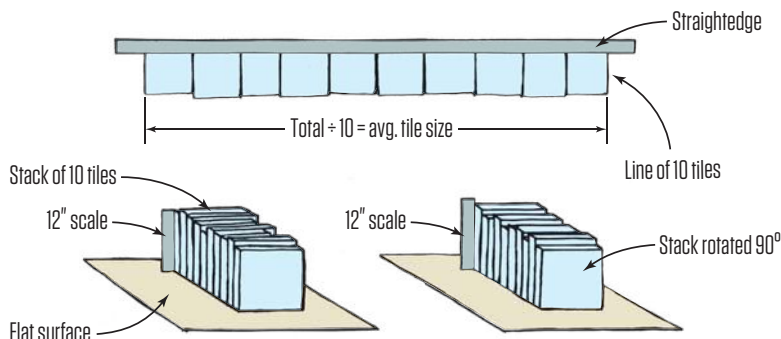
around the point where they intersect. Keep in mind that if one reference line gets shifted slightly to compensate for an out-of-square condition or a wall that isn't straight, the other line must be adjusted as well to maintain an exact right angle. This balancing process necessarily involves some compromise; that is, splitting the difference in a way that creates the most attractive layout.

If a floor is out of square or a wall isn't straight, I have to determine if rotating the reference lines in one direction or another will actually help mask the problem. While rotating the lines may work for single-room applications, the method may cause more problems than it solves if it is used on a job where tile extends from one room into another.

Tile size plays a big role in the approach I take with an out-of-square room. Smaller tiles (less than 8 inches) exaggerate the appearance of tapered cuts along an out-of-square wall, while larger tiles tend to mask this problem. For example, with 12-inch tiles (laid out properly, and with no tiles less than half-size), tapered cuts along a wall that is out of square by ½ inch or even 1 inch in 10 feet may not be noticeable. Conversely, if ½-inch sheet mosaics (as an extreme example) are used along walls that are out of square by ¼-inch in 10 feet, a taper equal to ¼ inch would be difficult to ignore.

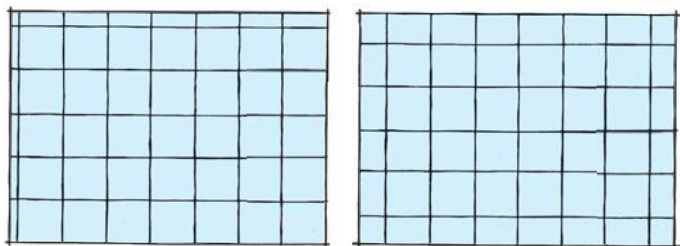
Once I am satisfied that the two perpendicular laser beams will

## Determining Tile Size



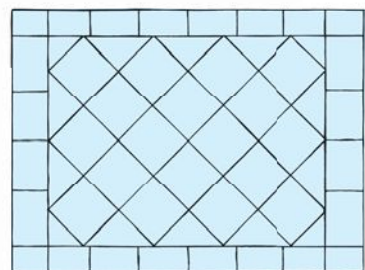
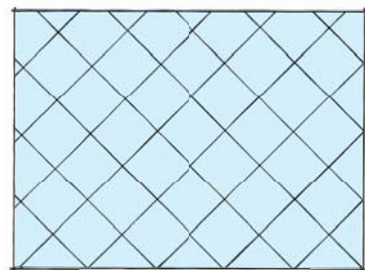
**(3)** Find the average size of 10 tiles placed side by side. Then stack them on edge and find the longest one. The midpoint between the average and the longest is the layout size.

## Balanced Versus Unbalanced Layout



**(4)** The better-looking balanced layout on the right uses edge tiles more than half a tile wide, but that layout may require more tiles than the unbalanced tile layout on the left.

## Balancing a Diagonal Layout



**(5)** A balanced diagonal layout should use just full, half, and quarter diagonal tiles. The top layout uses too many different sizes. Adding a border around an insert of diagonal tiles offers a balanced and even look (bottom).

yield a balanced layout in the room, I use the 3-4-5 method to verify the accuracy of the beams **(1)**, then convert them to chalk or pencil lines. Once the reference lines are plotted, they—rather than the uneven surfaces of the walls—become the foundation and points of reference for any layout lines that are added, helping to ensure a more efficient and professional-looking installation.

### MEASURE THE TILES

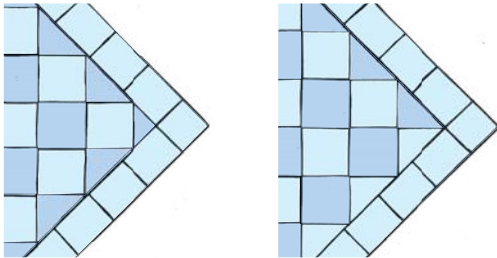
I cannot determine the final layout without knowing the size of the tiles being installed and the width of the grout joints, which is the next part of layout process. Dealers and installers refer to tiles as 4-inch, 6-inch, 12-inch, and so on. But in reality very few tiles are manufactured in whole-number sizes. Those numbers refer to a tile's nominal size—for marketing purposes—and not its actual size. Actual size is something of a misnomer, however, because industry tolerances allow for around  $\frac{1}{8}$  inch of variance

for a 12-inch tile. So I randomly select 10 tiles from all the boxes of tile supplied for an installation, and line them up side by side against a straightedge (or chalk line) so there are no gaps between tiles **(3)**. Then I divide the gross length by 10, which gives me an average tile size.

Next, I find the longest dimension of the 10 tiles by stacking them on edge and measuring the tallest one. Then I rotate the stack 90° and measure those heights. As a compromise, I find the mid-point between the tiles' average size and their maximum size and use this number as the average unit measurement for a single tile. I make this adjustment so that large tiles in proximity will not appear too crowded, and small tiles will not have oversized grout joints.

To this unit measurement I add the desired grout-joint width, for a combined tile and grout-joint dimension that I use to plot a grid of layout lines. To get the precise spacing, I multiply the average

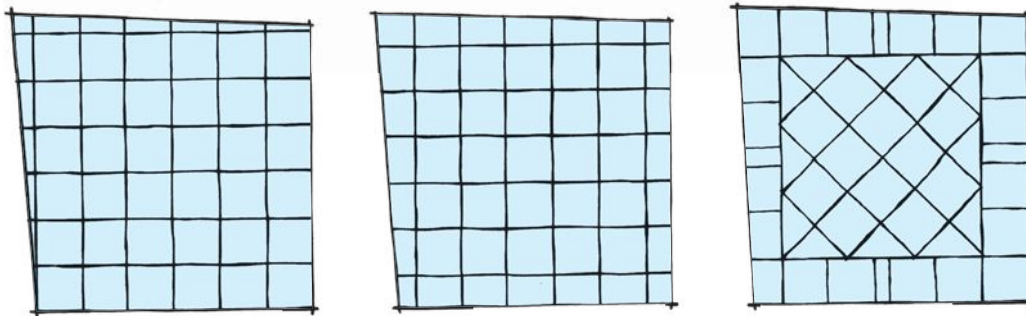
## Balancing a Checkerboard Layout



(6) For a diagonal checkerboard pattern, it's better to start with a quarter tile in the corner, as in the illustration at far left. Starting with two half-diagonals puts a straight line going directly into the corner (left), which is not as visually pleasing.

(7) When a room is out of square, the proper layout can disguise the variance. Placing full tiles along two sides and tile slivers on the others accentuates the out-of-square walls (below left). Using larger tiles along the edges, as in the center example, hides discrepancies better. A tile insert is the best solution (below right).

## Layout Tricks for Out-of-Square Surfaces



unit measurement by the appropriate number—which could be two or 10 or more, depending on floor size—and I jot down the results in my notebook for reference when I am plotting the lines. On large installations where it is impractical to dry-fit tiles to determine a layout, I transfer the unit measurements to a story pole.

### DETERMINING A LAYOUT

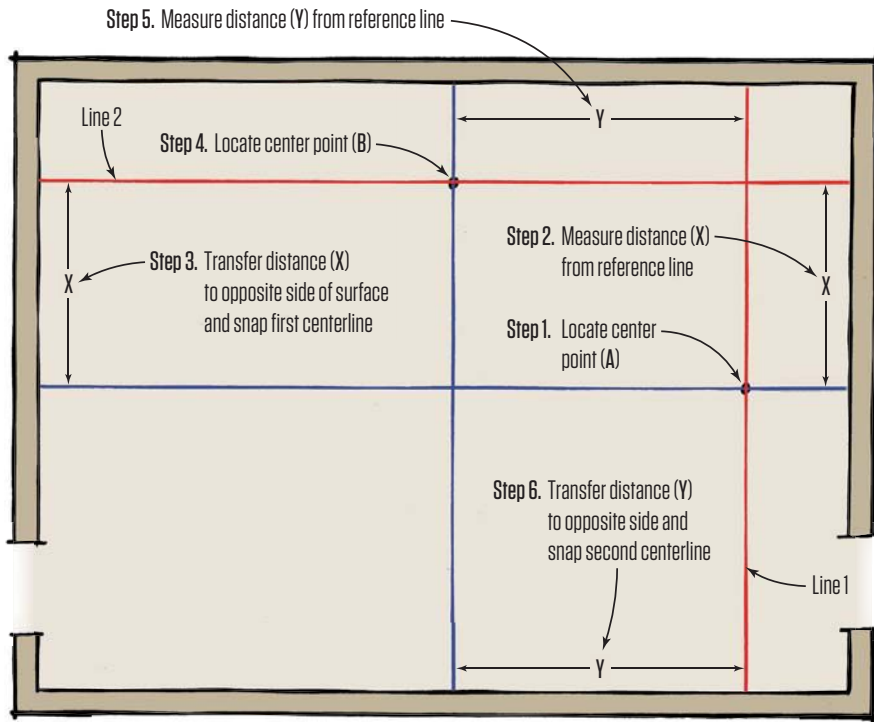
The final step in layout involves marking the setting bed with enough lines to guide the positioning of the tiles. Depending on the complexity and size of the installation, I may need as few as one or two lines, but some jobs call for dozens. For example, when installing rectified 12-inch tiles that can be positioned with tile spacers on a floor smaller than 100 square feet, I rarely snap more than two perpendicular layout lines. When installing handcrafted tiles, whose variable sizing makes tile spacers impossible to use, I may snap 30 or 40 lines for a 1,000-square-foot floor.

The goal of a layout is to provide a balanced, attractive tiled surface, regardless of the quality or cost of the tile. I begin the actual layout process by using just two of the industry's workmanship standards: Center and balance the tiled areas, and have no cuts smaller than half-size. For most installations, these are the only two standards an installer needs to produce a balanced layout.

Some installers don't bother trying to balance the layout and instead just begin with full tiles along two sides with no regard to the size of the cuts that will be needed on the other two sides. The result is an uneven layout, often with slivers along one or two of the sides—a very unprofessional appearance (4). Creating a balanced look requires more than just time spent on layout, it requires more tiles as well: The balanced layout in the illustration needs 48 tiles, while the unbalanced layout needs only 42.

Proper layout can also improve an unprofessional layout when installing diagonal tile (5). The top diagonal installation requires

## Plotting Floor Layout Lines



**(8)** Once the reference lines are established, most simple layouts can be done off the centerlines of the room. First find the center of the room on line 1. Measure the distance to line 2, and mark that measurement on the other side of the room. A line through those points is the centerline of the room. Using the same method, find the perpendicular centerline.

only 42 tiles, but is marked by an unbalanced look and many different sizes of tiles. Compare this with the bottom layout. Using an insert section—made from whole tiles along with half- and quarter-diagonals—and surrounding the insert with a border made from tiles greater than half-size, the layout looks balanced and professional, although it does take more time to lay out and requires 48 tiles to complete. When creating a diagonal checkerboard inside a border, use quarter diagonals in the four corners of the insert to create a balanced interface between the insert and the border tiles **(6)**.

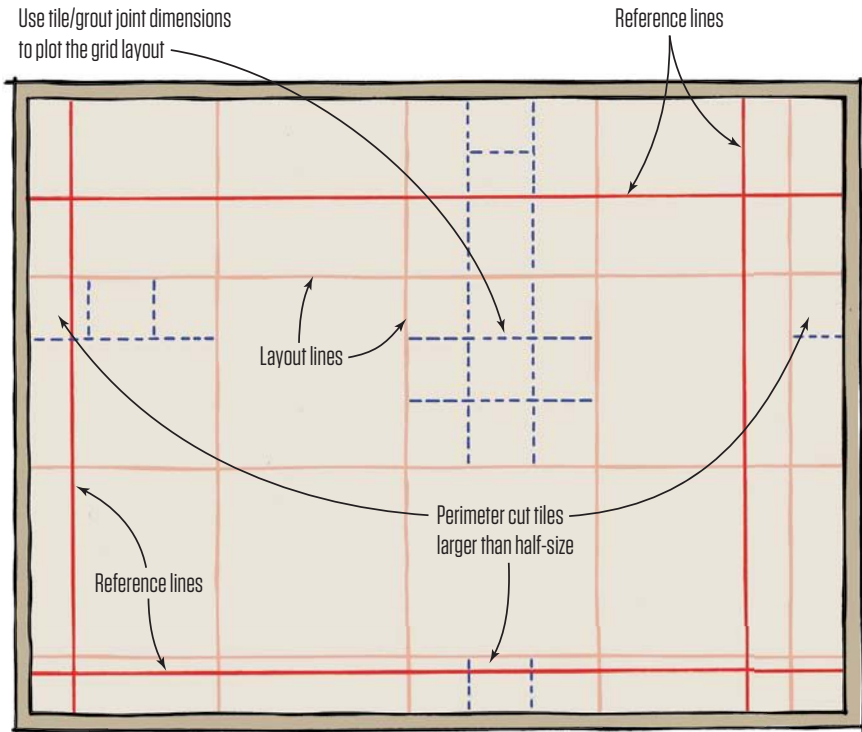
The examples mentioned above are based on areas that meet industry standards for straight and square. Layout orientation is even more important when the walls are crooked and the room is not square. The approach taken in the left-hand example in **(7)** is the worst-case layout, with no attempt made to balance the cuts. The center layout eliminates the slivers by shifting the layout so that all the perimeter cuts are greater than half-size, but the resulting layout is rather plain. The layout on the right is the most elegant way to mask an out-of-square surface, with its diagonal insert drawing a viewer's attention away from the perimeter.

### PLOTTING THE LAYOUT

Once I have determined the dimensions of the surfaces, tiles, and grout joints, I use the reference lines to plot layout lines, which determine the actual tile positions for most floor installations **(8)**. Generally I use a centerline layout, based on two perpendicular centerlines. I begin by marking the center point of the room on my first reference line, and then measure the distance from that point to my second, perpendicular reference line. I then measure that distance from the other end of my second line and join the two center marks with a chalk or pencil line to create the first centerline. Next, using a similar method, I plot a second centerline at 90° to the first. This basic two-line layout is useful for small installations (less than 50 square feet) and for installations of machine-made tiles that can be installed with spacers.

If a centerline layout produces cut tiles less than half-size at the perimeter of the surface, I shift the lines to one side or the other a distance equal to one-half the size of the tiles. This produces a layout with no tiles smaller than half-size. A tile layout with slivers along one or two of the edges of the floor is very unprofessional, but all too common.

## Plotting a Grid Layout



**(9)** For larger floors, lay out the tile in a grid pattern starting with two sets of parallel reference lines. Then use the tile and grout-joint dimensions to plot a grid, making sure the tiles are balanced and the perimeter tiles are no smaller than a half-tile wide. Base the size of the grid squares on the area you can comfortably reach during installation. A 3x3-foot grid is comfortable for laying 12-inch tiles.

For larger surfaces, I usually plot a grid of layout lines to suit the size of the tiles, instead of using centerlines **(9)**. For 12- or 18-inch tiles, I plot a 3x3-foot (nominal) grid; and for 16- or 24-inch tiles, I plot a 4x4-foot grid. To mark accurately, I begin at the longest reference line and plot a parallel reference line at the opposite side of the room. I repeat that process, except this time working off the perpendicular reference line. Next, to avoid sliver cuts, I use my tile and grout-joint dimensions to locate grid positions on the reference lines. Again, the grid spacing should yield no cut tiles smaller than half-size at the floor's perimeter. Finally, I snap the grid lines over the marks.

### STAGING FOR INSTALLATION

A grid of layout lines is helpful for more than just determining the exact position of the tiles. A grid also allows tiles to be staged or placed around the floor for a more efficient, flexible, and productive installation. A comprehensive grid of lines allows helpers to make cuts ahead of the installer and minimizes the number of times an installer has to handle the tiles. Or stated another way, a grid of layout lines allows the installer to put

his energy into the production-style installation of tile, instead of having to lug tiles around the site. Also, a layout grid gives an installer the opportunity to have all whole and cut tiles stacked within an arm's reach of the exact location where each tile will be installed.

On larger floors, I typically stack tiles so that as I use tiles for one layout grid square, I uncover the next grid square where tiles will be installed. I stack enough whole tiles to account for each square's whole tiles and cut tiles. Then the cuts can be made either at the time of the installation or beforehand. When working alone, I tend to make all the cuts first, so the cut tiles are readily available while I am installing the whole tiles. But if I have a helper, I prefer to have that person make the cuts as I proceed with the whole-tile installation. In that case, only whole tiles are staged on the grid, and the tiles that will be cut are stacked close to the snap cutter or wet saw.

*Contributing editor Michael Byrne is a tile setter and the author of the JLC book, Tiling for Contractors, from which this article was taken. Michael is also the moderator of the Tile Forum on JLC Online.*

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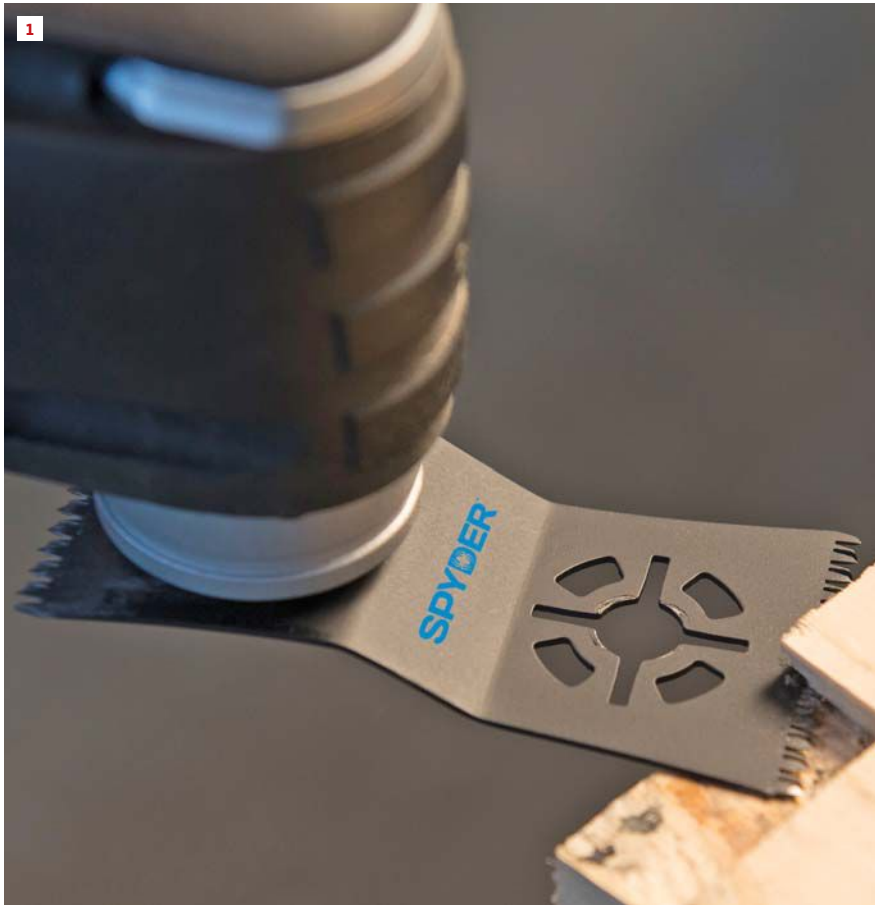


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## Cool Tools for 2014

### Bar-raising products from the annual STAFDA show

BY BRUCE GREENLAW

Walking the aisles at the annual Specialty Tools & Fasteners Distributors Association (STAFDA) trade show is like being in the front row at the tool industry's Super Bowl. Hundreds of tool and hardware manufacturers display and demonstrate their latest wares to distributors and retailers. For *JLC*, the STAFDA show represents a golden opportunity to talk shop with manufacturers large and small to get a preview of the exciting products that are going to be available over the coming year.

Here is a cross-section of noteworthy products we saw at the latest STAFDA show, which was held last November in Las Vegas.

#### 1. CUTTING-EDGE ACCESSORIES

Spyder Products has only been around since 2008, but it has already introduced several unique power tool accessories. Take its German-made chrome-vanadium jigsaw blades, for instance, which have teeth on both edges. I was told that the rear teeth help clear the kerf—to prevent binding, bending, and breaking—while creating a cleaner cut by acting as a sander. The rear teeth also allow the blades to cut in reverse. At the Spyder booth, I watched a blade make a tortuous cut in  $\frac{3}{4}$ -inch plywood. The blade was pushed hard while repeatedly turning on a dime; it even pivoted in place without breaking.

2



In a separate demo, a carbide-tipped Spyder Pro TCT hole saw (previous page, top right) punched through a 3/4-inch plywood sample in a heartbeat. The “Rapid Switch” and “Rapid Core Eject” hole saws can bore through a variety of materials, including wood, brick, and fiber cement. Spyder offers other noteworthy accessories, too, including double-sided blades for oscillating multi-tools (previous page, left). **Spyder, 888.471.2239, spyderproducts.com**

## 2. DUAL-BATTERY CIRCULAR SAW

Makita’s new 36-volt 7 1/4-inch circular saw is the latest addition to the 18V X2 LXT lineup of cordless tools, joining a rotary hammer, a chain saw, a blower, and a hedge trimmer. Each is powered by two batteries (hence the X2) from the company’s flagship 18-volt LXT lithium-ion platform, which includes more than 70 tools. According to Makita, the circular saw weighs 10.1 pounds with the batteries installed and cuts 2 5/8 inches deep at 90° and 1 7/8 inches deep at 45°. The bare tool (XSH01Z) includes a blade and costs about \$230. The kit (XSH01X) adds two batteries, a charger, and a tool bag, and it costs about \$420. **Makita, 800.462.5482, makita.com**

3



## 3. RECHARGEABLE THREE-PLANE LASER

Spectra Precision’s new self-leveling LT56 Universal Laser Layout Tool is designed to compete with the versatile Bosch GLL3-80. Both project one horizontal and two vertical 360° reference lines in three perpendicular planes that, depending on the modes you select, can collectively establish plumb, level, or square for any interior application. Both also have a pulse function so you can use them outdoors with a detector. They’re accurate to within 1/4 inch at 100 feet, and they allow you to override the self-leveling function for slope work. Unlike the Bosch, however—which is powered by four AA batteries that are said to deliver from five to 18 hours of runtime—the Spectra Precision uses a rechargeable 3.7-volt lithium-ion battery that’s designed to deliver from 25 to 45 hours of runtime on a full charge. According to the manufacturer, the LT56 also projects brighter and crisper lines than the Bosch. The LT56 costs about \$450 and includes a case and a universal bracket. The LT56-2 costs about \$550 and adds a detector. **Spectra Precision, 888.527.3771, spectralasers.com**

4



## 4. PNEUMATIC SHINGLE CUTTER

The new Captain Edge model HB-150 pneumatic hook-blade cutter by PneuTools resembles the Ridgid model R040SCA roofing cutter and is in fact made in the same Taiwan factory. Delivering 9,600 strokes per minute, it cuts roofing paper, roll roofing, and composition shingles (including architectural shingles) and can trim layered shingles at rake edges. The trick is to start the cut and let the tool and its beefy replaceable hook blade do the work. For best results, PneuTools recommends using a compressor with at least a 5-gallon tank and a minimum output of 4.9 SCFM. The HB-150 weighs 1 pound, and at 10 1/2 inches long with a blade installed, it will slip into most toolbelts. It costs between \$80 and \$100, including a hook blade. **PneuTools, 888.689.2529, pneutools.net**



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1) When properly equipped. 2) Standard pickup class. EPA est. 20 city/28 hwy mpg based on EcoDiesel V6 4x2. Actual results may vary. 3) Based on Class 2 single rear wheel axle cargo vans when properly equipped. 4) See dealer for a copy of the powertrain limited warranty. Ram and Ram ProMaster are registered trademarks of Chrysler Group LLC.

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### 5. RUNAWAY RUNTIME

In 2012, Metabo introduced one of the first batteries to be rated at 4 amp-hours to the U.S. At the STAFDA show, the company displayed the world's first 5.2-amp-hour battery, which it is plugging into its 18-volt lineup of cordless tools. According to Metabo, the new battery is the same size and weight as its 4-amp-hour battery but delivers more power and, predictably, about 30% more runtime on a full charge. It costs about \$140 and packs a three-year warranty. **Metabo, 800.638.2264, metabo.us**

### 6. CORDLESS JOBSITE FLOODLIGHT

The typical cordless work light used to be a xenon flashlight that came with cordless combo kits. But new models have been rolling out lately and redefining the category. Milwaukee's new M18 18-volt floodlight, for instance, contains eight LEDs with two output settings emitting up to 1,100 lumens at an intensity of up to 1,300 lux. An octagonal bumper on each end keeps the light stable when you rotate it to direct the beam. You can also stand it on a vertical piece of 1/2-inch EMT conduit, string it up with mason's line, or hang it on a nail. I watched a demonstration at the booth, and I was impressed. The light costs about \$100 without the batteries or charger. **Milwaukee, 800.729.3878, milwaukeetool.com**

### 7. 21-GAUGE PINNER

Judging by recent threads in the *JLC* Finish Carpentry online forum, 21-gauge brad and pin nailers are gaining serious traction with carpenters who appreciate fasteners that provide significantly more holding power than 23-gauge pins and leave much smaller entry holes than 18-gauge brads. Popular models are made by Cadex and Omer, but Senco just became the first mainstream power-tool manufacturer to join the conversation. The company's new 2.7-pound FinishPro 21LXP fires 21-gauge headless and slight-head pins from 3/8 inch to 2 inches long. Deluxe features include last-nail lockout to prevent dry firing, a narrow nose for easy access, a reversible belt hook, and a jam-clearing wrench and extra no-mar pad that store on board. The tool is scheduled to hit the market in late March and will cost about \$250, case included. **Senco, 800.543.4596, senco.com**

### 8. MAKING HISTORY

I've read in the *JLC* online forums that Jenny compressors, which are made in Pennsylvania, are related to the vintage Emglo compressors that still command respect in the construction industry. At the Jenny booth, national sales manager Ken Jones told me that Jenny had indeed supplied compressor components to Emglo for more than 30 years and now makes the same components for its own compressors. Jenny offers a variety of models, from industrial stationary compressors to hand-carry and wheeled portables, like the wheeled 8-gallon twin-tank model K15A-8P shown here. That compressor lists for \$1,046. **Jenny, 888.425.3669, jennyproductsinc.com**

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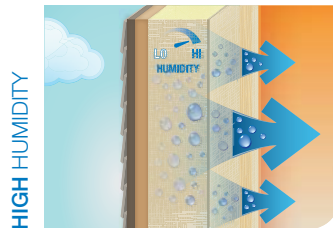
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**9. PNEUMATIC TROWEL**

ESI has introduced what it believes to be the first pneumatic walk-behind trowels. Unlike gas-powered trowels, the tools don't emit hazardous fumes in enclosed spaces, nor are they subject to the line loss suffered by electric trowels fed by long power cords. The padded handles are adjustable to reduce fatigue, and they house a safety switch that shuts off the tool if you lose control. The blade pitch adjusts quickly to move from floating to finishing. According to ESI, the machines need between 80 and 100 SCFM of air flow at around 110 psi to operate properly and are typically powered by towable gas-powered compressors. The 36-inch model EWT90A costs about \$3,600, and the 48-inch model EWT120A is about \$4,300. ESI is also rolling out related pneumatic tools, including rammers and vibratory plates. **ESI, 866.648.7101, theesichoice.com**



**10. BUCKET BOSS REBOOT**

The original canvas Bucket Boss tool organizer, which fits over a 5-gallon bucket, hit the market in the late 1980s, and for the next several years, the company greatly expanded its product offerings. During the past decade, though, the brand has been mired in buyouts and consolidations. Pull'R Holding Co. is now relaunching it by reviving many of the original products, as well as introducing the new Bucket Boss Professional line of tool bags, toolbelts, and knee pads. Three of my favorites are the Contractor's Portfolio briefcase (#62200, \$24, not shown), which accommodates an iPad; the Pro Drop-Bottom 18 tool bag (#68018, \$100), which has a divided drop-bottom compartment for organizing accessories; and the Ballistic Suspension Rig (#57100, \$140), which has roomy pockets and stretch suspenders. **Pull'R Holding Co., 888.797.7855, bucketboss.com**



**11. CORDLESS IMPACT DRIVER/WRENCH**

The distinctive Socket Ready chuck on Bosch's new model IDH182 18-volt brushless impact driver accepts not only 1/4-inch hex bits but also 1/2-inch square-drive impact-ready sockets. That eliminates the need to use a socket adapter with your impact driver and addresses most of the jobsite applications that would normally require a separate impact wrench. The tool offers three speed/torque settings and delivers up to 1,650 inch-pounds of torque. According to Bosch, when used as an impact wrench, the tool has enough power to sink 3/8x6-inch lag screws into hardwood or to drive the lag screws required for fastening deck ledgers to rim joists. Three LED lights help illuminate the work. The model IDH182-01L includes a pair of 4-amp-hour batteries, a charger, and an L-Boxx-2 case and costs \$330. The IDH182-02L includes two 2 amp-hour batteries with the charger and case and costs \$280. A third model, the IDH182BL bare tool, includes the case only and costs \$200. **Bosch, 877.267.2499, boschtools.com**



**12. POWERFUL PLIERS**

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13



nose, and 9-inch linesman pliers cut materials with 40% less effort than usual, according to the manufacturer. That's a blessing for doing any repetitive cutting, and it can make the difference between one- and two-handed cutting with some materials, such as heavy electrical cable. The tools are scheduled to launch at The Home Depot in April. The diagonal and long-nose pliers will each cost about \$18, and the linesman version will cost about \$20. **Crescent, 800.688.8949, apexhandtools.com**

### 13. STRONG, SLEEK COIL FRAMING NAILER

Stick-style framing nailers outsell coil-style models in the U.S., but coil framing nailers are more popular in some parts of the country and globally. They're significantly heavier than stick nailers when fully loaded, but they can fire far more nails between reloads. MAX recently replaced its model CN890II SuperFramer coil nailer with the CN890F SuperFramer, shaving about an inch off the height for improved accessibility and a few ounces off the weight, while boosting the power by 7.2%. The magazine was also redesigned for easier reloading. The tool drives 15° wire-collated nails from 2 to 3½ inches long. It costs about \$350, about 15% less than its predecessor. **Max USA, 800.223.4293, maxusacorp.com**

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### 14. GET A GRIP

Swanson Tool's new Savage brand GripLine tape measures have a distinctive rotating magnetic blade hook that can grab rounded edges and the curved surfaces of cylindrical objects up to 2 inches—or even more—in diameter. The sample I tried at the Swanson booth easily pulled measurements from 2½-inch black iron pipe, 2-inch PVC pipe, a chain-link-fence post, metal conduit, and a metal stud. The tapes have nylon-coated blades with a scale on both sides, a spring-loaded lever-action belt clip, and a blade standout of 8½ feet. They come in lengths of 16, 25, and 30 feet and cost from \$17 to \$24. **Swanson Tool Co., 800.291.3471, swansontoolco.com**

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### 15. EASY DRIVER

When I spotted Channellock's Code Blue 13 'N 1 ratcheting screwdriver at the show, it reminded me of the terrific Megapro multi-bit screwdrivers that I've been using for years. They have a patented bit cartridge in the handle that makes it exceptionally easy to select and install a bit. You just pull out the cartridge until it stops, rotate it to find the bit you need, pop out the bit, push the cartridge back into the handle, and insert the bit into the shaft. That normally takes only a few seconds. The shaft doubles as a ¼-inch hex driver.

Not surprisingly, it turns out that Channellock's screwdriver is made by Megapro. Its cartridge holds six double-end bits that have various slotted, Phillips, Torx, and square-recess tips. The double-duty bits can also be chucked into an electric drill. The screwdriver's dual-composition grip and rugged 28-tooth ratchet enable you to apply up to 225 inch-pounds of driving torque. Cost is about \$35. **Channellock, 800.724.3018, channellock.com**



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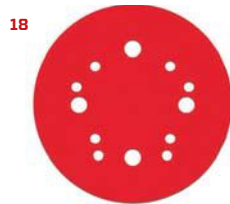
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### 16. LIGHTER LADDERS

DeWalt and Werner both introduced Type IA D-rung fiberglass extension ladders that use lightweight composite rails to reduce the weight. DeWalt's 24-foot model DXL3021-24 and 28-foot model DXL3021-28 weigh 45 and 53 pounds, respectively. Werner's D6400-2 series of Lightweight Performance (LP) ladders come in lengths of 16, 20, 24, and 28 feet and weigh from 32 to 53 pounds. Overall, both companies' ladders weigh roughly 12% to 15% less than equivalent ladders with standard fiberglass rails. Prices top out at around \$570 for the 28-footers. **DeWalt, 800.433.9258, dewalt.com; Werner, 888.523.3371, us.wernerco.com**

### 17. COMPACT MAG DRILL

In case you missed it, California builder Sim Ayers wrote about his Hougen HMD904 portable magnetic drill in *Toolbox* (Dec/13). Using annular cutters, the tool can quickly bore holes up to 1 1/2 inches in diameter in steel up to 2 inches thick. Ayers uses it to bore holes through steel I-beam flanges and steel plates to make mechanical connections that satisfy the seismic requirements of the California Building Standards Code. The tool costs about \$925 and weighs 27 1/2 pounds.

Fein's new Slugger brand JHM ShortSlugger portable magnetic drill can bore holes up to 3/16 inches in diameter by 2 inches deep, costs \$700, and weighs just 22 pounds. At only 11 inches tall, it also squeezes into tight spaces. In fact, according to Fein, the ShortSlugger weighs less, costs less, and is more compact than any other model in its class. Like the Hougen, it's made in the U.S. **Fein, 800.441.9878, jancy.com.**

### 18. FAST AND CLEAN SANDING DISCS

Diablo's new 5-inch hook-and-loop universal sanding discs have a unique 12-hole pattern to allow through-the-pad dust collection with all five-hole and eight-hole random-orbit sanders. According to Diablo, a series of two-minute, third-party sanding tests revealed that, on average, 80-grit samples of its new discs removed 54% more material from hard maple and delivered 49% better dust collection than 80-grit samples from its three leading competitors. Diablo said it achieved these results primarily through the optimal distribution and orientation of its ceramic-based grains and the distinct layout of its small and large dust holes. The 60-grit to 220-grit discs are sold in packages of four, 15, and 50, as well as in two 7-piece project packs. Prices range from about \$5 to \$20 per pack. **Diablo, 800.334.4107, diablotools.com**

### 19. POTENT CORDLESS MULTI-TOOL

A recurring theme at the show was that many of the latest cordless tools with brushless motors perform as well as their corded counterparts. At the DeWalt booth, though, I was told that its new cordless model DCS355D1 brushless 20V MAX XR oscillating multi-tool actually outperforms its new corded model DWE315K. Powered by a 2-amp-hour battery, the cordless version shares



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several key features with the corded one, including an extra-large “Dual Grip” variable-speed trigger, an accessory system that allows you to quickly swap out attachments by squeezing a lever, and an LED headlight. The kit costs about \$200 and has one battery, a charger, a universal accessory adapter, a contractor bag, and various cutting and sanding accessories, including a guide that allows you to adjust the depth and height of your cuts. The bare tool (model DCS355B) costs about \$130. **DeWalt, 800.433.9258, dewalt.com**

#### 20. FOAM-SLICING SAW BLADES

Once, on a large industrial job, I had to cut truckloads of rigid foam with a table saw, and I will never forget the odor and clouds of clingy dust that were generated. Bullet Tools’ new Centerfire circular saw blades look to be a brilliant solution to those problems. The blades have a knife edge rather than saw teeth, and they quickly slice through rigid foam panels (including foil-faced varieties) and insulating concrete forms, leaving factory-smooth edges—without creating a dust storm. The 7 ¼-inch blade costs \$60; the 10-incher, \$90. We’ll take the two blades for a spin in a future *Toolbox* column. **Bullet Tools, 800.406.8998, bullettools.com**

#### 21. BUDGET UNIVERSAL SAFETY GLASSES

After trying on some SecureFit safety glasses at the 3M booth, I decided they’re not only ingenious but a bargain. Weighing less than an ounce, the glasses flex at the temples so they comfortably and securely fit just about anyone. The 200 Series (\$2.25 or \$2.41 per pair) offers clear, amber, and gray anti-fog or anti-scratch lenses. The 400 Series (\$3.25 per pair) adds soft adjustable nose pads that help reduce slippage, padded temple touch points, and a hint of neon green along with a choice of clear anti-fog, gray anti-fog, or indoor/outdoor mirror lenses. To view a video, visit the Safety Video Center at 3M’s website. **3M, 800.328.1667, 3m.com/occsafety**

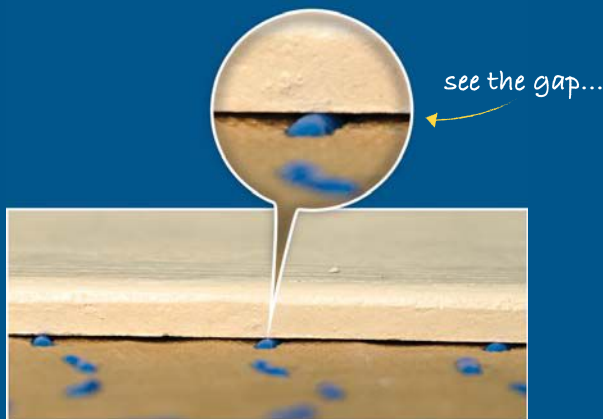
#### 22. REMODELING-FRIENDLY TILE SAW

Husqvarna’s TS 60 wet tile saw, which won a 2013 Editors’ Choice Award from *Tools of the Trade*, looks formidable in person. It comes with a folding stand; has wheels, so it can be maneuvered by one person; adjusts easily to make diagonal, bevel, and plunge cuts; and can rip 24-inch tiles and cut 20-inch tiles diagonally. It also features electronic soft start and protective circuitry with an LED warning light; cleans the water for reuse; and includes other refinements, such as a built-in bull’s-eye level. But the big story is its water containment system, which delivers water to the blade from below rather than above the tile to shield the jobsite from the usual overspray and slurry—just the ticket for remodeling. It can also deliver the water conventionally if needed. Price: \$1,200. **Husqvarna, 800.288.5040, husqvarna.com**

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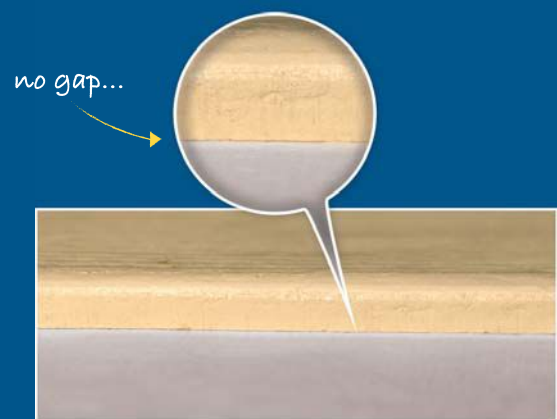
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### 23. LINEAR COMPACT CIRCULAR SAW

My 28-year-old Porter-Cable 4 ½-inch model 314 wormdrive trim saw has been a savior on countless remodeling jobs because it fits into tight spaces, has a longer reach than conventional compact sidewinders, and allows me to make overhead cuts with little fear of a powerful kickback. The saw is also easy to use with cutting guides because everything tucks neatly within the margins of the base. The new Rockwell RK3441K 4 ½-inch compact circular saw isn't a worm drive, but it appears to have all the other attributes of my Porter-Cable, plus a blade-left orientation that some users will appreciate. Unlike my trim saw, it can cut a 2-by at 90°. The saw weighs just 5 pounds, has a 10-foot cord, and can hook to a vacuum. It costs about \$100 and comes with a three-year warranty. **Rockwell, 866.514.7625, rockwelltools.com**

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### 24. DECK INSURANCE

To counter lateral loads on deck ledgers, the article "Strong, Safe Decks" (Sep/13) recommends following the 2012 IRC (Figure R507.2.3) and using hold-down tension hardware in at least two locations to tie deck joists to the house's floor joists. The usual approach at each location is to install a pair of Simpson Strong-Tie DTT2 Deck Tension Ties linked through the ledger and rim joist by a ½-inch threaded rod, but the hardware can be a hassle to install where the deck joists and floor joists don't line up or are perpendicular. The new Deck Harness Lateral Load Connector Kit developed by GRK Fasteners, on the other hand, consists of a galvanized chain that passes through a hole in the ledger and rim joist and connects to deck and floor joists with U-bolts. A thermoplastic plug seals the hole. GRK says that, because the chain doesn't need to run in a straight line, the Deck Harness cuts installation time in half. A one-connector kit costs \$150, and a two-pack costs \$290. **GRK Fasteners, 800.263.0463, grkfasteners.com**

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### 25. ACCESSIBLE JOBSITE CHEST

According to the manufacturer, the new Knaack 4830-D jobsite chest is the first on the market to include an independent locking drawer (called the Junk Trunk) so you can quickly grab some tools or supplies without opening the main box. Above the drawer, the raised floor of the main box allows you to reach the bottom more easily while still leaving enough headroom for 5-gallon buckets. The lid has a continuous finger grip on the front and sides so you can open it from almost any angle. A locking hinge keeps it open, and a gas strut prevents it from slamming shut when you close it. The chest costs \$800. **Werner, 800.456.7865, knaack.com**

*Bruce Greenlaw, a contributing editor to JLC, conducts tool tests and tool reviews and manages the Toolbox department.*

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## Wednesday, May 7

12:00–6:30 pm

### Registration

1:00–2:15 pm

### Dig for Gold in a New Way: Social Media

Presenter: Crystal Washington, Social Media Consultant  
Contractors and customers increasingly rely on social media to discover each other, do business, and make decisions. Crystal Washington will help assure that your digital personality is as friendly and inviting as your human persona, as well as help you deal with cyberbullies.

2:15–2:30 pm

### Coffee Break

2:30–3:30 pm

### What's Next for Online Sites?

Presenter: Liza Hausman, VP of Community, Houzz.com  
Remodelers nationwide have begun using Houzz as a way to promote themselves and get business. Meanwhile, sites such as Houzz, Angie's List, and Porch have expanded dramatically beyond their original services. What's next for these online sites? A top executive from Houzz will provide the big picture.

3:30–3:45 pm

### Coffee Break

3:45–5:00 pm

### Show Me the Money: How to Collect What's Due

Presenter: Thea Dudley, Director of Financial Services, Guardian Building Products  
In two decades of work as a collections and credit officer, Thea Dudley has trekked across deserts to recover goods, taken FBI interrogation classes to learn negotiators' "tells," and suffered through more lame reasons for giving credit than she can count. She knows how to go after those who welch on their debts. Hear her advice on how you can keep valuable dollars from dribbling away.

5:30–6:30 pm

### Welcome Reception

## Thursday, May 8

7:00–8:00 am

### Breakfast

8:00–9:15 am

### What's New With the EPA's Lead-Paint Rule

Presenter: Tanya Mottley, Director of the Office of Pollution Prevention, EPA  
Few regulations have generated as much interest and ire as the Environmental Protection Agency's lead-paint rule. In this exclusive presentation, the head of the EPA office in charge of the rule will give a status report on the regulation and its impact.

9:15–9:30 am

### Coffee Break

9:30–10:45 am

### Smart Prospecting: How to Get the Gold

Presenter: Michael Hoffman, President, Igniting Performance  
Economists say your sales should be growing, but economists don't close deals—you do. The question is, could you be closing more? And making sales more efficiently? Use Michael Hoffman's tips to get all the gold you're due.

10:45–11:00 am

### Coffee Break

11:00 am–12:00 pm

### New Hills, New Gold: Three Places to Look

Presenter: Sarah Gaspar Henry, General Manager, Gaspar's  
There are multiple ways to succeed in remodeling and home improvement, and there's no rule that says you can't succeed in more than one line of business simultaneously. In this panel discussion, you'll hear from remodelers who run a trio of different businesses that are related to but distinct from traditional remodeling.

12:00–1:00 pm

### Lunch

1:00–2:00 pm

### Home Technology: What Can We Expect? And Who Will Install It?

Presenter: Lauren Hunter, Product Editor, Hanley Wood  
No matter how traditional the house may look on the outside, homeowners want the latest gadgets inside. And with the boom in technology devices for the home, the options have never been greater. Lauren Hunter has traveled to see many of the latest products; now she's reporting what she has found. And she'll also ask: Who will own this business in year to come: You as general contractor, or some specialist sub?

2:00–2:15 pm

### Coffee Break

2:15–3:15 pm

### Moving on Up—And the Leadership Challenges Therein

Presenter: Kevin O'Connor, Executive Coach  
A growing market means there will be lots of people in your company moving up the ranks. But how do they learn to lead when they've been used to following your instructions? Kevin O'Connor has studied this subject for years, and his answers are sure to help your employees make the most of their promotions.

3:15–3:30 pm

### Coffee Break

3:30–4:30 pm

### They're Your Customers, Bless Their Hearts

Presenter: Greg Schwem, Corporate Comedian  
Greg Schwem's comedic take on the 21st century workplace and work/life balance has landed him on SIRIUS Radio, FOX News, Comedy Central and the pages of *Parents Magazine*, plus concert stages with the likes of Celine Dion and Jay Leno. His observations about you and your customers will leave you smiling and ready to celebrate the evening's Big50 Reception and Dinner.

6:30–9:30 pm

### Big50 Reception and Dinner

## Friday, May 9

7:00–8:00 am

### Breakfast

8:00–9:30 am

### Remodeling Industry Partner Workshops 1

9:30–11:00 am

### Remodeling Industry Partner Workshops 2

11:00 am

### Conference Adjourns



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# FLOOD CLEANUP



## After the Boulder Flood When the flooding stops, the cleanup begins

BY MICHAEL SPRINGER

**B**oulder and 16 other counties in Colorado are still reeling from the disastrous floods that tore through the state last September. Record rainfall of more than 21 inches in some parts of Boulder county sent water rushing down every canyon and gully from the Continental Divide all the way east across the state, leaving an estimated 20,000 houses damaged or destroyed.

Witnessing this 500-year flood event was stressful for all involved, but the aftermath and cleanup proved to be even more taxing. Contractors instinctively reached out to help past clients, but many were unprepared for what they found when they were finally

able to reach flooded properties. No one knows when a disaster like this will strike his or her community; in this article, I've pulled together the many lessons learned during the first weeks of Colorado's recovery effort, with the hope that they will help other contractors be better prepared, and so be able to respond more effectively, should a similar event occur in their backyard.

### **PUMPING AND MUCKING OUT**

Once you can gain safe entry to a salvageable building damaged in a flood disaster, the first step is to evacuate the water and remove the soggy debris. Mold can set in quickly and is difficult to remove

once established. And it needs to be taken very seriously; besides causing allergic reactions and other respiratory ailments, mold can wreak havoc on a home's property value.

**Floor drains.** Often the sewer or septic outlet that the basement drain flows to will be flooded and may even back up into the house. It is important to check the floor drain first: You wouldn't want to discover that a day of pumping could have been avoided simply by removing a plastic grocery bag from the drain grate. Wearing rubber gloves, take off the drain grate and dig around for mud, rags, or other materials that may be creating a blockage.

**Sump pits.** In a house that has a sump pit, the existing pump might have failed during a power outage or may have just blown its breaker. Proceed with caution, but first check the installed pump to see if it works. If it doesn't, the pit will still provide the best place for you to set a working pump. In a crawlspace, find the lowest point and create a place to pump from by digging a pit several inches deep.

**Pumps.** A trash pump (also called a sewage pump) is the best choice for removing a lot of "chunky" water in a hurry. A large gas-engine unit can work without electricity (utility power can take days to be restored) and can handle mud, sludge, and other solids with ease. A friend related to me how a small rock that had been sucked into his crawlspace sump pump had stopped it dead. If he hadn't crawled through the water to clean it out, it would have meant a devastated ground floor rather than just puddles in his crawlspace. (He was also lucky that the power stayed on in his neighborhood).

Unless you have your own pump, however, during a disaster you may be stuck using whatever type of pump you can get your hands on. By the second full day of rain in Boulder, the rental yards and area stores were cleaned out of pumps of all sorts.

If you use a sump pump, create an external intake filter by setting the pump inside a 5-gallon bucket with lots of small holes drilled in it; even better, wrap the pump in a piece of screen or hardware cloth (1). I prefer to use screen because the pump can sit closer to the floor or even be set down into the floor drain opening. You may still need to clear debris from such homemade filters when they get clogged, but they will protect the pump from being damaged.

Remember, you are fighting gravity and friction while pumping, so use the fattest, shortest hose you can. Avoid sharp bends and kinks in the hose and don't lift the water any higher than you have to. Be sure to situate the outlet end of the hose well downhill of the building—water pumped out into the yard may find its way through the saturated soil and end up back in the house.

Many portable submersible sump pumps cycle on and off via a pressure switch, so they won't turn on unless they are under several inches of water. This can be a problem once the water is just a few inches deep. With a float switch, though, you may be able to pump all but about one inch of water. Float switches are easy to rig manually because the external floats can be wired or taped into an "on" position—but be careful not to burn out the pump by running it dry.

**Wet Vacs.** Regardless of the type of pump you use, you will be left with lots of water on the floor. At that point, you can either bail

*continued on page 76*



A small, reliable sump pump (1) with an internal pressure-activated switch can move more than 2,500 gallons of water per hour. The homemade filter was fashioned from window screen attached to a loop of Romex. Two upgrades improve wet vac performance: a dump valve (2), which makes the tank easier to drain; and a vac muffler (3), which reduces volume and mellows out the shrill pitch of a vac, making it much more pleasant to work with in a closed space. Riveting a plastic flap between the vac's hose inlet and the filter helps keep the filter free from muck during wet cleanup (4). For dry vacuuming, the flap protects the paper filter from incoming jagged debris.

## Hauling and Disposing of Flood Debris

Flooding creates countless tons of waste. In Boulder and other flooded towns, if an affected building was not wiped out completely, the floodwaters still turned building materials, furnishings, and treasured possessions into hazardous waste overnight. Warm weather and wet conditions made every pile of trash a moldy health risk that had to be taken care of as quickly as possible. Since the normal waste stream was instantly overwhelmed, the city and county governments stepped in to help clean up the area, providing three different forms of aid to residents: roll-off containers that were hauled off and replaced a couple of times a day; free drop-off at commercial waste transfer stations, limited to storm-damaged materials from a specific city or county; and free curbside pickup, which was instituted after it became clear that many residents had no plans to dispose of the thousands of refuse piles that sat in driveways, yards, and alleys for weeks after the flooding. This service was also limited to residential waste; commercial buildings and multifamily apartments and condos with centralized trash pickup were excluded.

**Hazardous waste.** None of the available disposal options could take landfill-prohibited items, however, which were handled as follows:

- Separate roll-off containers were provided by local waste disposal and recycling facilities for recyclable metals, including most appliances (except those containing refrigerants). Some organic materials, such as yard and food waste, were also commercially composted rather than hauled from remote areas to the landfill.
- Paints, automotive fluids, and other chemicals had to be taken to a hazardous waste disposal facility.
- Electronics and appliances containing refrigerants had to be taken to a designated drop-off facility, which also accepted other recyclable materials, such as plastic and rigid foams.
- “Dirty” dirt—mud, silt, and sand contaminated with chemicals and sewage—had to be landfilled. Only sediment from streams that was deposited away from buildings was reused as fill.

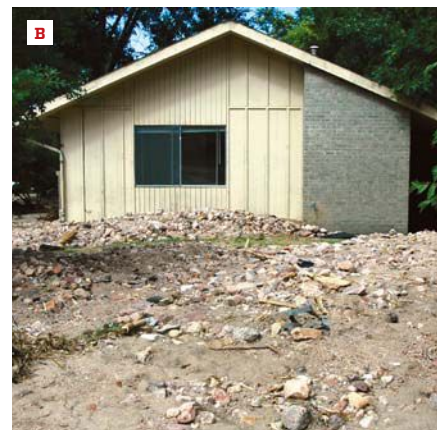
**Asbestos and lead paint.** Information on debris containing asbestos or lead paint was contradictory. A county website said that if asbestos was not known to be present in a building, you could treat waste material as non-asbestos flood debris. But a state website outlined more

stringent guidelines. The same was true for lead paint. No guidelines or warnings were posted regarding the handling and disposal of lead paint debris in a disaster area, so it was not clear if RRP rules had to be followed during cleanup.

**No contractors allowed.** None of the disposal services provided could be used by contractors. Even though the services were paid for with public funds, a resident

could not hire a hauler to transport debris to a public container site and expect to have tipping fees waived. Similarly, any flood sediment deposited on the street by a contractor was ineligible for city-funded curbside pickup. Showing a building permit proving that the waste came from a home within the disaster area would not serve to waive the fees. According to the Boulder County Resource Conservation Division, this rule was designed to protect the homeowners, who would be charged a tipping fee by contractors either way. Only having the homeowner with you in the truck at the time of drop-off would serve as enough proof that what you were hauling was from a legitimate site.

The lesson here for contractors is to charge clients full price for hauling and disposal—and not to expect to take advantage of any disaster services or programs intended to help clean up the damaged properties in an affected area. And the lesson for homeowners is that as soon as they hire a professional to help them, they lose any publicly-subsidized services and benefits provided to citizens in an area affected by a disaster.



The sheer volume of debris quickly filled city-supplied roll-offs, prompting residents to dump debris on the ground nearby, blocking haulers' access (A). Sand and sediment near buildings (B) was assumed to be contaminated with chemicals and sewage, and had to be hauled to landfills rather than re-used as fill.

*continued from page 74*

the remaining water into a bucket with the pump in it, or switch to a wet vac (2, 3, 4). Wet vacs are very efficient at sucking up water and sludge, and the bigger the vac, the better. When it comes to this kind of work, I rely on a big, inexpensive vac with a large-diameter hose. It works fast and holds a lot of water, and the filter is relatively cheap to replace after extra-dirty jobs like this. I know these vacs can be used with the filter off for wet use, but I prefer to leave it on to protect the motor from excess moisture and nasty contaminants.

As with the pump, use the shortest hose you have and avoid loops or low spots in the hose that will act as a trap. Prop a flat nozzle about ¼ inch off the floor in a corner or at the lowest spot in the floor, and use a large push broom or floor squeegee to direct the remaining water to the vac.

My vac has a float ball to block off the suction when the vac is full of liquid, and you can tell when the ball seals because the motor sound changes to a high-pitched whine. Some fancier vacs shut off via an electric circuit that the water closes. Just be sure you know when your vac is full of water; otherwise, you will find out when you hear a loud pop and see a puff of smoke, and all the lights go out.

Full of water, my 16-gallon vac weighs about 150 pounds. The easiest way to empty it is to drop a pump into the tank for several seconds. On jobs without a pump present, fill the tank only part way and empty it into 5-gallon buckets that you can carry out. Once when clearing a flooded crawlspace, I left the vacuum on the main floor above, rolled it to the doorway when full, and drained it into a bucket through the vac's drain port.

Be sure to dump the water outdoors, downhill of the house. Dumping the water into the toilet may result in water rising back up the basement floor drain.

## SECOND-STAGE CLEANUP

After a flooded basement is pumped and mucked out, all wet and contaminated building materials must be disposed of quickly to restrict the growth of mold and remove the residual moisture from the building. During the week after the flood, I visited a site that was undergoing the second stage of cleanup by groups of volunteers supervised by the local Flatirons chapter of Habitat for Humanity.

**Flooring.** Soaked carpet and padding should be the first thing to go. Cut it into strips a few feet wide, roll up as much as you can handle, and crosscut the strip. To carry these dripping wet materials upstairs and through finished living space without making a mess, cut the rolls to fit into a bucket or garbage can. For tile and other hard flooring, common sense will dictate what should be removed. If sewage was present in the floodwater, it is probably safer and easier to remove the flooring than to clean it in place. For "clean" floodwater, it depends more on the amount of water damage. Vinyl flooring might be just fine, but hardwood floors probably won't be worth saving.

**Drywall.** For shallow flooding, some people skim, and remove drywall only to a level that is a few inches above the height of the floodwater. But that means patching and finishing will require workers to bend or work on their knees, adding labor expense. The

professional approach (for flooding less than 4 feet deep) is to deeply score the existing drywall 48 inches above its bottom with a utility knife and pry it off the wall from the bottom up (5, 8).

**Wood.** Studs and furring strips are often left in place to dry out. As long as the wood is sound, it should be okay. Floor plates, furring strips, and any other wood in direct contact with concrete (9) will hold moisture for a long time and should be chemically treated to suppress mold growth and allowed to dry.

**Insulation.** Fiberglass insulation that has been saturated should be cut out and discarded (7). Less-porous foam insulation is often left in place to dry out, but not in all cases (6). Closed-cell and open-cell foams offer no food for mold, but they can hold moisture in for a long time, so make sure any wood that is in direct contact with foam is dried and treated. For the same reason, concrete walls behind foam insulation should be given enough time to dry thoroughly before drywall is hung over the insulation. Generally, this will require removing the foam, then replacing it after the concrete has had time to dry.

**Electrical wiring.** Romex-type nonmetallic cable and plastic boxes should be okay to leave in place, but conduit and armored cable can hold water inside (10), which presents a danger. Do not use these circuits without inspecting for soaked wiring and consulting an electrician. Also, don't trust any electrical device that has been underwater (11). Flooded receptacles and switches should be replaced. Even if they dry out completely, sediment or other fine debris from the flood water that washed into a device could lead to insufficient contact or shorting.

While I was at the Habitat site, a volunteer using a shop vac illustrated the seriousness of this danger pretty effectively and got a good scare in the process. After running the vac for a minute or so plugged into a receptacle wired through conduit, the device exploded with a flash that lit up the room like lightning. The plastic face of the receptacle was incinerated, leaving bare metal contacts visible. I'm not sure if it shorted out due to water in the device or in the conduit, but it made clear the point about not using flooded devices.

**HVAC ducts.** Ducts that were underwater should be dismantled and cleaned out or replaced. And don't forget to clean out and dry the bottom of the furnace cabinet. Get a professional opinion on the state of the furnace and hot-water heater: If water made it up to the blower, pump motor, or burner, they may be ruined.

## SANITIZING AND DRYING OUT

Once you've removed the water and wet building materials from a flooded structure, the next crucial step is to clean, sanitize, and thoroughly dry both living and storage spaces. As with the previous stages of cleanup, the relative cleanliness of the floodwater makes a difference as to how drastically the affected space must be treated. The established scale for flood events is as follows:

- Category 1 is clean water, as from a burst or leaking supply pipe, or fresh rainwater or snowmelt leaking through a roof.
- Category 2 (gray water) is groundwater or water flooding in from outside, but it could also come from the drain side of a dishwasher or clothes washer.



**(5)** After even shallow flooding, cutting back drywall 48 inches off the floor reduces finish labor

**(6)** The best way to cut corner bead is to use an angle grinder with a thin cutoff wheel, or an oscillating multi-tool fitted with a metal-cutting blade.

**(7)** Bottom plates and other wet wood framing should be treated and dried thoroughly to prevent mold.



**(8)** HVAC ducts need to be drained and cleaned inside and out. Also note that the window trim is left in place, leaving a 2-inch strip of drywall for taping when patching the joint.

**(9)** On walls built against concrete, remove drywall, but leave furring strips in place. After this photo was taken, the beadboard was also removed to aid drying.



**(10)** Romex-type wiring can usually be left in place, but conduit should be removed because it can fill with water.



**(11)** Even when dried out, flooded electrical devices could contain sediment or other fine debris. This receptacle seemed fine but blew up after a few minutes of use.

■ Category 3 (black water) is sewage that often backs up through soil pipes and spills out of toilets, shower and sink drains, and floor drains.

**Cleaning and sanitizing.** Before a space is dried out, it needs to be cleaned well. A cleanup contractor I interviewed uses a pressure washer on walls and floors for any category 2 or 3 cleanup—it's a lot easier than trying to scrub every nook and cranny of every furring strip, wall stud, radiator, and so on. The wash and rinse water is collected by a large truck-mounted water extractor similar to a carpet cleaning extractor.

At this stage in a flood cleanup, all surfaces contaminated by floodwater or backed-up sewage must be cleaned and disinfected. This work should be left to a professional cleaning company, but in a pinch, the old standby is diluted bleach (mold sites recommend 1 cup per gallon, a 1:16 bleach-to-water ratio). Use a large spray bottle to coat any surfaces that were wet with floodwater—wood framing, soil pipes, concrete walls and floors. Just go easy around the furnace and hot-water heater, because chlorine is corrosive when it contacts steel and iron. Give the bleach a little while to soak in, then rinse everything from the walls down with fresh water. As before, squeegee the water with a push broom and collect it with the wet vac.

Frankly, though, this process is best left to the pros. Chlorine bleach is toxic not only to the microbes and spores you are attacking, but to you as well. Using it means wearing an effective respirator and goggles, avoiding direct contact with skin, and providing fresh air while applying it.

The pros use broad-spectrum, anti-microbial cleansers and, according to commercial supply houses and disaster restoration contractors alike, the latest botanical formulations are revolutionizing the industry. Unlike traditional formulas, these products don't require any PPE during handling, making them safer and easier for workers to apply. Also, these disinfectants don't have to be rinsed, so they provide lasting bacteriostatic and fungistatic protection. After wet cleaning, a second application of disinfectant is used to sanitize affected surfaces.

**Mold remediation.** Unless mold is detected in a building, a separate treatment to prevent mold is usually not required. If any mold is detected or even suspected, bring in a trained and certified mold remediation contractor. Even if you are aware of all the requirements and methods of treatment, you don't want to be liable if a flood-damaged building you worked on ever develops mold in the future.

Be aware that mold has to be physically removed; any "dead" mold left in place still presents a hazard to the building and its occupants (13). Be sure that anyone dealing with mold follows established remediation guidelines, like those published by the Institute of Inspection, Cleaning, and Restoration Certification (iicrc.org). The IICRC is a non-profit organization that develops ANSI-approved standards for water-damage restoration and mold remediation that professionals in the industry look to.

While you are working in an area where you suspect mold is present, the Centers for Disease Control (CDC) and the EPA recommend using at least an N-95 NIOSH-approved particulate respirator mask to prevent breathing in airborne microorganisms. An N-100 respirator mask is a step above that, and half- or full-face respirators with canister filters offer even better protection.

Regardless of your previous experience with seemingly harmless mold in shower stalls or under sink cabinets, any exposure should be treated with caution. A friend of mine recounted how spending just a few nights in an apartment with flooded walls and floors (caused by a plumbing leak) triggered a two-year bout with adult-onset asthma.

## DRYING OUT

Once everything is cleaned, the final step is to dry out the space. If you are renting equipment, keep in mind that the experts around here told me they typically have to keep their machines running for three to five days. If you live in a more humid area or if cold weather sets in, it may take longer to dry things out. The large tool-rental chain in Boulder said they brought in five semi trailers with more than one thousand pieces of drying equipment right after the flood—and it was all put into service right away. The demand for machines was in the following order:

■ **Dehumidifiers.** These are the most effective tools for drying out a building because they actively condense moisture out of the air. Large, high-capacity mobile units dry air more quickly than household units do. In regions with high ambient humidity, during the heating season, and in spaces without ample ventilation (like basements and crawl-spaces), a dehumidifier is essential for drying a building.

■ **Air movers.** Also called carpet driers or carpet fans, these distinctly-shaped fans (12) blast a high volume of air along the floor to promote evaporation. They are typically used in conjunction with dehumidifiers: The powerful stream of air pulls the moisture out of materials at the surface, and the dehumidifier draws the moisture out of the air. During warm weather in relatively dry areas like Boulder, air movers and other fans may be enough to dry out a space as long as there is good ventilation with fresh air at low humidity.

■ **Air scrubbers.** These recirculating fans have a series of three or four filters to clean particulates out of the air. The third filter is a HEPA filter, which can trap fine mold spores, and the optional fourth filter contains activated charcoal to absorb odors.

**Moisture content.** While the building is drying out, use moisture meters to monitor the moisture content of the wood that was wet. Sample readings should be taken all over, but it's especially important to check areas where the wood stayed wet longest and dried slowly, such as stud wall plates sitting on concrete. Some cleanup contractors prefer using moisture meters with probe pins, while others prefer the nonintrusive scanning type.

I learned of two methods for determining when a building is dry. One company I interviewed said it keeps the machines going until every reading it takes is at 9% or below. Another company said that its target number is within 4% of readings of known dry areas in the same building, which means drying to between 4% and 11%. Either way, materials in the building need to be brought well below the 17% moisture content that will harbor mold.

*Michael Springer is a Boulder resident and a frequent contributor to JLC and Tools of the Trade. This article is adapted from a series of reports he filed at jlconline.com in the weeks after the disaster.*



Photos: 12, 13, Michael Springer; sandbags, EdAndriaski/AP

Air movers or carpet fans **(12)** create a high-volume stream of air to pull moisture from the surfaces of materials into the air; a dehumidifier condenses moisture from the air into water that can be carried out of the building. In moderate temperatures, water-soaked materials can easily develop mold before they are able to dry **(13)**. Mold discovered during cleanup should be treated—preferably by a mold remediation specialist—and removed from the building.

### THE VALUE OF SAND BAGS

We've all seen television footage of people using sandbags to protect buildings against flooding. While it seems futile—the rising water inevitably flows between and over the top of the makeshift barrier—the fact is that, during a flood, half of the benefit provided by placing sand bags around a building comes from the reduction of sediment infiltration.

Until you've seen it firsthand, you may not realize how much damage sand and silt can cause—much more than water alone. Water can be drained and dried out of walls, basements, and crawlspaces, but sediment will fill up every available nook and cranny, clogging drains and ruining electrical devices and gas appliances. And since it contains suspended organic matter and unknown levels of bacteria, you can't count on it to dry into harmless dirt and sand; it has to be removed.

Water may crest a protective wall made of sand bags (or staked-down straw or hay bales), but most of the heavier sediment won't go over the top with the water. So if you have a chance to build even a short barrier wall around property you are trying to protect, it may reduce the damage—and cleanup effort—significantly.

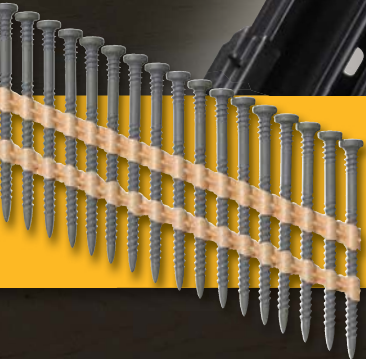


Sandbags slow but do not stop the flow of flood water; still they can prevent damage to finishes, appliances, and equipment caused by sediment and other particulates.

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BY CHARLES WARDELL



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### Vapor Open Monolith

Pro Clima's Solitex Mento is not a traditional perforated house-wrap. Poreless and waterproof, the monolithic membrane allows vapor to migrate from inside to outside by passing along a molecular chain. According to the maker, even a slight vapor pressure differential will activate the chain reaction. ProClima, 800.995.6329, foursevenfive.com



### Adjustable Humidity

Leviton's Humidity Sensor allows for easy adjustments: Simply remove the faceplate and use a screwdriver to raise or lower the humidity set point or adjust the fan runtime. Rated for fan/light combinations of up to 600 watts and 5 amps, the sensor comes in white, ivory, and light almond. Cost is \$34.50. Leviton, 800.323.8920, leviton.com/humidity



### Wet Set Epoxy

New Red Head Epcon S7 Hybrid Epoxy Adhesive features the strength of an epoxy with the cure time of an acrylic. Formulated for adhering threaded rod and reinforcing bar into concrete, it's ICC-ES listed for use in submerged and water-filled holes, as well as in saturated and dry conditions. Cost is \$29 for a 10-ounce cartridge. ITW, 877.489.2726, itwredhead.com

## Products



### Stands Up to Salt

Engineered for corrosive environments, Gold Coat joist hanger hardware is coated with a non-reactive, organic polymer layer on top of a traditional zinc coating, which the company says offers the corrosion resistance of stainless steel. Approximate cost for a single 2x6 joist hanger is \$1.87, compared with 96¢ for the same size with a triple zinc coating. USP Structural Connectors, 800.328.5934, [uspconnectors.com](http://uspconnectors.com)



### Snap-In Storms

Indow Windows' acrylic interior storm window inserts are custom made: A dealer comes to the jobsite with a laser measuring tool and can fit even the most out-of-square windows. A silicon compression tube holds the finished insert in place. Cost is about \$20 per square foot plus a measuring fee; the laser system is available for \$1,250. Indow Windows, 503.284.2260, [indowwindows.com](http://indowwindows.com)



### Variable Heat

The Envy fireplace's "Full Flame" burner technology varies the air-fuel ratio to adjust temperature while maintaining a strong flame. Features include a remote control, interior lighting with six settings, and a modulating blower with noise-canceling ducts. Brick and porcelain interiors are available, as well as various door and glass options. Prices start at \$4,050. Lennox Hearth Products, 800.655.2008, [lennoxhearthproducts.com](http://lennoxhearthproducts.com)



### Small Home Tankless

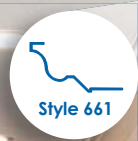
The NRC711 Condensing Tankless Unit is sized for smaller, two-bath homes. Available in indoor and outdoor versions, the unit is gas-fired with an Energy Factor of 0.94 for both NG and LP fuels and offers a compact design, scale-detection software, and a built-in digital display. The indoor direct-vent model can be vented with 3-inch PVC or CPVC pipe. Cost is around \$1,000. Noritz, 877.773.8556, [noritz.com](http://noritz.com)

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**Walk the Plank**

The Pier Collection of glazed wood-look porcelain tiles is offered in just one size, 6 by 36 inches, and mimics the hardwood planks seen in older docks and jetties. Wood grain is imprinted using a high-definition inkjet process. The tiles come in four colors, with matching accents and cove bases available. Prices are around \$4 to \$5 per square foot. Florim USA, 877.356.7461, florimusa.com



**Tileable Drain**

The Kerdi Drain line now includes a tileable covering support for its 4-inch-square shower drains. It consists of a stainless steel plate with a coating that facilitates bonding to ceramic or stone tile, allowing the installer to replace the metal grate with a tile that matches the rest of the shower floor. List price for the complete drain with the tileable covering support is \$130. Schluter Systems, 800.472.4588, schluter.com



**Precut Flashing**

Fortifiber's L7 Flashing should make it easier to flash electrical boxes and other penetrations. Made from a butyl adhesive and a coated woven facing, it's precut in an L-shape with 9-inch-long and 3-inch-wide legs. It's formulated to work with the manufacturer's Moistop Sealant and can be applied in temperatures down to 25°F. Cost is about \$65 for a bag of 50 pieces. Fortifiber, 800.773.4777, fortifiber.com

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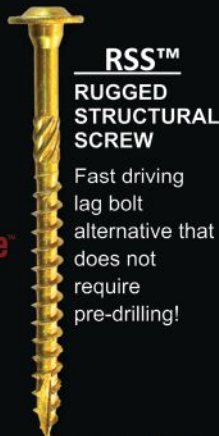
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BY JON VARA

## Legislation Is the Mother of Invention

**Larry Birnbaum did not set out** to become the rough-service-bulb king of North America. But the passage of the federal Energy Independence and Security Act of 2007—or EISA, as it's also known—left him little choice.

As you may recall, EISA aimed to reduce U.S. energy consumption by gradually eliminating conventional incandescent light bulbs, with production of 100-watt bulbs to end by January 2012, 75-watt bulbs by 2013, and 40- and 60-watt bulbs by 2014.

At first, that looked like bad news for Birnbaum—a third-generation bulb manufacturer from South Hackensack, N.J., whose grandfather was a personal friend of Thomas Edison's. But the public response to the newly-enacted law suggested that consumers weren't ready to give up on incandescents just yet.

"It was just crazy," he says. "Word got around that incandescent bulbs were going away, and we had people lining up outside in pickup trucks and vans to buy them by the case."

With five years to work with before EISA's restrictions began to bite, Birnbaum ventured into what he calls "the belly of the beast," sifting through the act's sprawling 310 pages for a legally acceptable way to keep the lights on. The answer, he found, was the rough-service incandescent—a bulb that is superficially similar to the familiar general-service type, but contains a vibration-resistant filament. Though foreign imports of rough-service incandescents would be prohibited under EISA, U.S. manufacturers would be allowed to continue making them even after general-service bulbs had been phased out.

Moving the rough-service bulb out of its original niche in the industrial sector—where it was commonly used to light vibrating machinery—and into the new one created by the general-service bulb's disappearance did involve some product redesign. Birnbaum notes that EISA also established an array of new requirements for rough-service incandescents, including additional filament holders, a gas-filled globe, thicker glass, and a brass (as opposed to aluminum) threaded base.

But the new EISA-compliant bulb—dubbed the Newcandescent—was ready to go before the phase-out deadline. It has been selling briskly for about \$3 a bulb, and while that's several times the price of its general-service predecessor, the new bulb is expected to last 10 times as long. Its 10,000-hour service life, in fact, rivals that of a compact fluorescent.

The compact fluorescent, admittedly, does use fewer watts for a given amount of light, making it a more cost-effective choice in the long run. But to Birnbaum and his customers, there's simply no substitute for the clear, familiar light of an incandescent bulb. It's an idea, you might say, whose time has come again.



New Jersey manufacturer Larry Birnbaum switches on a treasured bulb presented to his grandfather, Samuel, by Thomas Edison in 1914.

*Jon Vara is a writer in Cabot, Vt.*

Photo: Newcandescent.com

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\*KOMA Plantation™ Porch Flooring is typically 5-10% less costly than mahogany hardwoods; and up to 25% less expensive than other PVC products. March 2014.



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