

**Asphalt Shingle  
Basics**

---

**LED Lighting  
That Works**

---

**Superb Paint-  
Grade Finishes**

---

*Bonus Inside*

PROFESSIONAL  
DECK BUILDER



# COMMERCIAL TRUCK SEASON

GOING ON NOW THROUGH JULY 2

[RAMTRUCKS.COM/COMMERCIAL](https://ramtrucks.com/commercial)

- \$2,000** Consumer Cash<sup>4</sup>
- \$1,000** On-The-Job Upfit Allowance<sup>5</sup>
- \$500** CTS Bonus Cash<sup>6</sup>
- \$250** Gas Engine Bonus Cash<sup>4</sup>

---

**\$3,750** TOTAL SAVINGS

<sup>1</sup>Based on class 3-5 pickup-based conventional cab chassis. <sup>2</sup>Class 3-4 models. <sup>3</sup>Class 3 models. <sup>4</sup>Residency restrictions apply. See dealer for details. Must take retail delivery by 05/31/18. <sup>5</sup>See dealer for details. <sup>6</sup>Must show proof of eligible Commercial business. Residency restrictions apply. See dealer for details. Must take retail delivery by 05/31/18. Ram is a registered trademark of FCA US LLC.

A TRUSTED  
PARTNER ON-SITE  
AND OFF.

---

## RAM CHASSIS CAB

---

BEST-IN-CLASS STANDARD GAS HORSEPOWER<sup>1</sup>

BEST-IN-CLASS GAS TOWING<sup>2</sup>

BEST-IN-CLASS DIESEL TOWING<sup>3</sup>

CLEAN FRAME RAILS FOR MAXIMUM UPFIT CAPABILITY





# Introducing the New Standard in Siding.

## Timeless Beauty, Durability, Performance and Easy to Install

ICON features realistic Select Cedar™ woodgrain with an easy-to-install hidden fastening system—all working together to perfect the look of real wood. ICON's minimal moisture absorption virtually eliminates expansion and contraction for better performance on any home. ICON™ Composite Siding sets a new standard that other siding products just can't match.



800-233-8990 • [www.certainteed.com](http://www.certainteed.com) • <http://blog.certainteed.com>

ROOFING • SIDING • TRIM • DECKING • RAILING • FENCE  
GYPSUM • CEILINGS • INSULATION

**CertainTeed**  
SAINT-GOBAIN



31

## FEATURES

### 31. Superb Paint-Grade Finishes

Pro tips for a flawless, durable finish for interior trim

### 39. High-Efficacy Lighting

New technology offers promise—and peril

## DEPARTMENTS

### 11. Training the Trades

Asphalt shingling basics

### 15. Q&A

Two-rope system for fall arrest and positioning

### 19. On the Job

Pouring a level floor for tile; working with WarmBoard

### 26. Energy

Controlling humidity in warm climates

### 49. Code's Eye View

Drip edge and the IRC

### 52. Products

Moisture-resistant MDF; weatherproof hidden deck fastener; countertops; thin brick; deck-joint flashing tape; shiplap boards; fire membrane I-joists; more

### 56. Toolbox

Cordless wormdrive-style saw; wormdrive table saw

### 61. Advertising Index

### 62. Backfill

Beware coal tar pitch



39

On the cover: Arthur Stone, of Stone Brothers Inc., installs a new architectural shingle roof in Hinesburg, Vt. See more about installing asphalt shingles on page 11. Photo by Tim Healey.

THE JOURNAL OF LIGHT CONSTRUCTION (ISSN 1056-828X), Volume 36, Number 8, 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 2018 by Hanley Wood. All rights reserved. Canada Post Registration #40612608/G.S.T. number: R-120931738. Canadian return address: IMEX, PO Box 25542, London, ON N6C 6B2. Periodicals postage paid at Washington, DC, and at additional mailing offices. POSTMASTER: Send address changes to JLC, Box 3530 Northbrook IL 60065-3530.

Customer Satisfaction  
*made easy*

DesignRail®

ALUMINUM RAILINGS

CableRail

STAINLESS STEEL CABLE INFILL

LED Lighting

RAIL & POST ACCENT LIGHTS

feeney®  
*makes it easy*

For information and free catalog  
1-800-888-2418 or feeney5.com

**JLC**

JLCONLINE.COM

**V.P., Editorial Director** John McManus, jmcmanus@hanleywood.com  
**Editor in Chief, JLC Group** Clayton DeKorne, cdekorne@hanleywood.com  
**Editor, Professional Deck Builder** Andrew Wormer, awormer@hanleywood.com  
**Editor, Tools of the Trade** Chris Ermides, cermides@hanleywood.com  
**Chief Design Director** Aubrey Altmann, aaltmann@hanleywood.com  
**Managing Editor** Laurie Elden, lelden@hanleywood.com  
**Art Director** Tina Tabibi, ttabibi@hanleywood.com  
**Senior Editors** Ted Cushman, tcushman@hanleywood.com;  
Tim Healey, thealey@hanleywood.com;  
Roe Osborn, rosborn@hanleywood.com  
**Interactive Designer** Alexander Cortez, acortez@hanleywood.com  
**Products Editor** Lauren Shanesy, lshanesy@hanleywood.com  
**Intern** Kathleen Brown  
**Contributing Editors** David Frane, Dave Holbrook, Tom Meehan,  
Mark Parlee, Emanuel Silva, Gary Striegler, Tim Uhler, Charles Wardell  
**Senior Web Developer** Braddock Bull, bbull@hanleywood.com

**Production Director** Margaret M. Coulter  
**Digital Ad Manager** Annie Clark  
**Ad Production Coordinator** Bernadette Couture  
**Group Director, Audience Marketing & Circulation** Christina Lustan  
**Circulation Promotions Designer** Chara Anderson  
**President, Contractor Group** Rick Strachan

HANLEY WOOD MEDIA

**Chief Revenue Officer/President** Dave Colford  
**Executive V.P., eCommerce & Digital** Jennifer Pearce  
**Executive V.P., Operations** Sarah Welcome  
**Senior V.P./General Manager, Digital** Christie Bardo  
**V.P., Digital Strategy and Operations** Bridget Forbes  
**V.P., Client Operations** Mari Skelnik  
**Senior Director, Print Production** Cathy Underwood

PUBLISHED BY HANLEY WOOD

**Chief Executive Officer** Peter Goldstone  
**Vice Chairman Emeritus** Frank Anton  
**Chief Financial Officer** Matthew Flynn  
**Chief Revenue Officer/President, Media** Dave Colford  
**President, Marketing** Jeanne Milbrath  
**Chief Data Officer/President, Metrostudy** Andrew Reid  
**Senior V.P., Marketing** Sheila Harris  
**V.P., Corporate Accounts** Ryan Flom  
**V.P., Finance** Ron Kraft  
**V.P., Corporate Controller** Keith Rosenbloom

**Editorial & Advertising Offices:**  
**The Journal of Light Construction,**  
Hanley Wood LLC  
One Thomas Circle NW, Suite 600  
Washington, DC 20005  
202.452.0800

JLC will occasionally write about companies in which its parent organization, Hanley Wood, has an investment interest. When it does, the magazine will fully disclose that relationship. Reproduction in whole or in part is prohibited without written authorization. Opinions expressed are those of the authors or persons quoted and not necessarily those of JLC.

SoftPlan remodel  
design software for  
kitchens | baths | additions  
\$985



**SOFTPLAN**  
ARCHITECTURAL DESIGN SOFTWARE

remodel

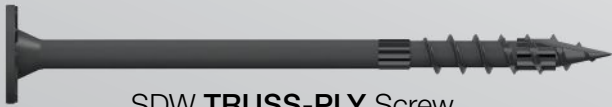
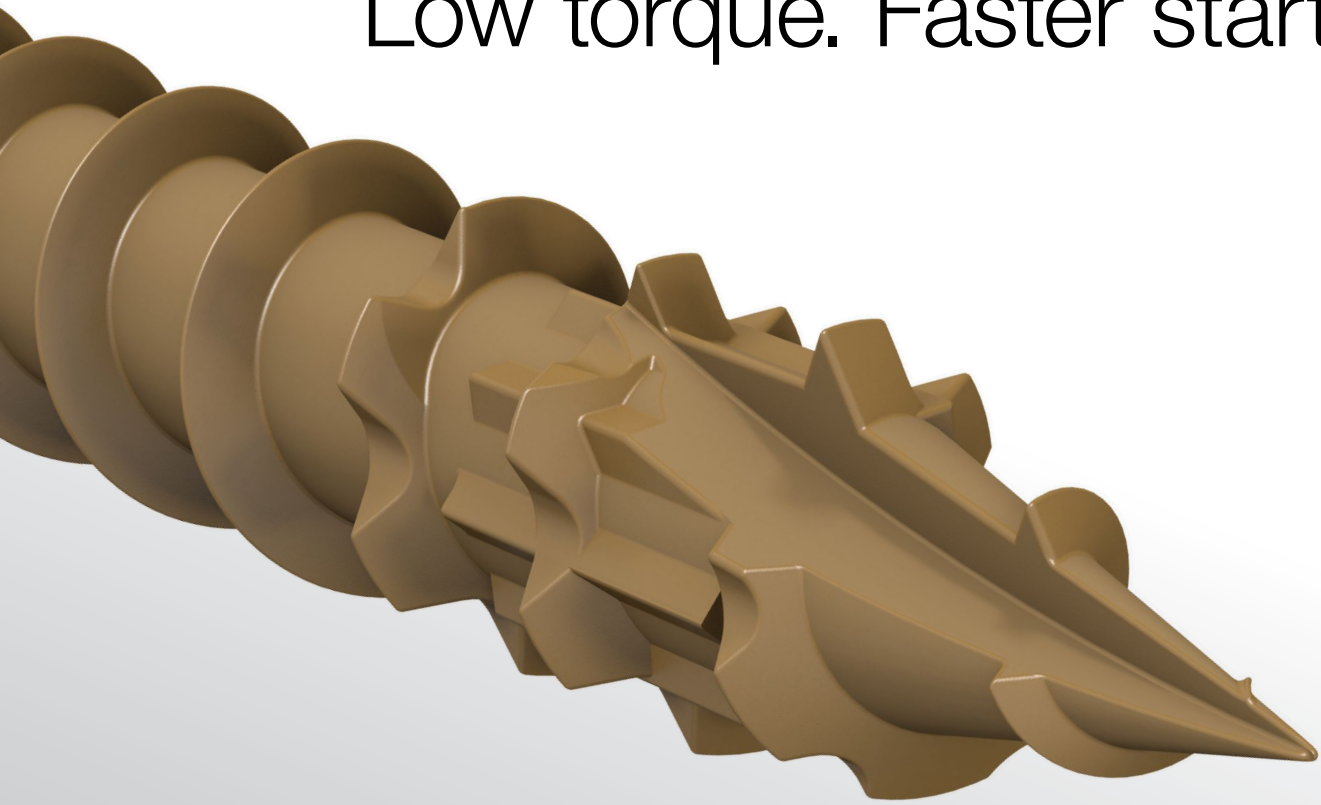
version 2018 available now

free trial: www.softplan.com or 1-800-248-0164

JLCONLINE.COM

# The New SawTooth™ Point

Low torque. Faster starts.



SDW **TRUSS-PLY** Screw



SDW **EWP-PLY** Screw



SDWS **LOG** Screw



SDWH **TIMBER-HEX** Screw



SDWS **TIMBER** Screw



SDWS **FRAMING** Screw

Make your jobs go smoother with industry-leading structural screws featuring our patented SawTooth™ point. Innovations such as serrated threads and vertical knurls reduce torque and eliminate predrilling, making your drives quicker and easier.

To learn more about our code-listed Strong-Drive® fastener line, visit [go.strongtie.com/strongdrive](http://go.strongtie.com/strongdrive) or call (800) 999-5099.



 TYPAR

 TYPAR

 TYPAR

**STOP  
MAKING  
TEAR-  
ABLE  
MISTAKES.**

**BRING ON THE  
ELEMENTS.**

Nothing pretty about a weather barrier blowing in the breeze. Or rips and gashes that give water a way in. That's why TYPAR® BuildingWrap delivers superior tear strength to protect walls from wind and jobsite rigors. Plus, the only lifetime limited system warranty around.\*

\*Certain limitations and exclusions apply.

[www.TYPAR.com](http://www.TYPAR.com)

Made in USA. © 2018, Berry Global, Inc.

**JLC**

## INFORMATION DIRECTORY

### CONTACT INFORMATION

**jlconline.com**; 202.452.0800

#### JLC

Hanley Wood LLC  
One Thomas Circle NW, Suite 600  
Washington, DC 20005

### EDITORIAL

We welcome letters and article submissions from our readers. Contact us by mail at the address above, **Attn:** Editorial Dept., or via email at [jlconline@hanleywood.com](mailto:jlconline@hanleywood.com). Keep copies of all original materials.

### SUBSCRIPTION SERVICES

For help with your **JLC** subscription, contact us:

**Online:** [jlconline.com/cs](http://jlconline.com/cs)

**Email:** [jlconline@omeda.com](mailto:jlconline@omeda.com)

**Phone:** 888.269.8410

**Mail:** **JLC**, PO Box 3530, Northbrook IL 60065-3530

You can subscribe online at:

[jlconline.com/subscribe](http://jlconline.com/subscribe)

#### Subscription rates for qualified readers:

1 year/ \$39.95; 2 years/\$64.95.

Canada, International: add \$15/ year for surface delivery.

Sales tax will be added to total due if required by your state law.

### JLC BACK ISSUES

**JLC** subscribers have free access to every issue of **JLC** since 1986. Enable your free access at [jlconline.com/register](http://jlconline.com/register). Copies of individual back issues can be purchased for \$4.95 each, plus \$5 shipping per order. Call 888.269.8410 for availability.

### ARTICLE REPRINTS

For custom reprints of **JLC** articles, call Wright's Media, 877.652.5295; [hanleywood@wrightsmedia.com](mailto:hanleywood@wrightsmedia.com)

### JLC UPDATE EMAIL NEWSLETTER

**JLC** Update, our email newsletter, is free to **JLC** readers. Each issue contains industry news and the latest tips on building materials, techniques, tools, and technology. Subscribe online at [jlcupdate.jlconline.com](http://jlcupdate.jlconline.com)

**For list rentals:** The Information Refinery, Brian Clotworthy, 800.529.9020, [brian@info refinery.com](mailto:brian@info refinery.com)

**Privacy of mailing list:** We rent our subscriber list to reputable companies. If you do not wish to receive promotional materials from other companies, please call us, toll-free, at 888.269.8410.

JLCONLINE.COM



# GIVE YOUR BUSINESS MORE HORSEPOWER.

**Get the most powerful training tool in the business.**

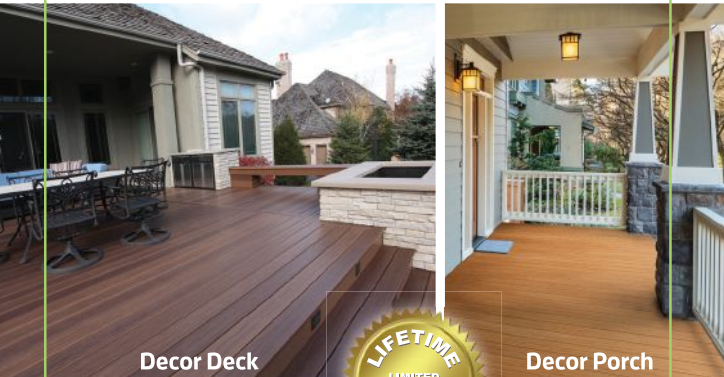
JLC's Digital Field Guide is the most comprehensive, trusted skill training and best practices resource for pros in the residential and light construction industry. Give your business the boost it needs—more projects. More profit. Add the JLC Digital Field Guide to your toolbox today. **Subscribe to the JLC Digital Field Guide today.** [jlconline.com/how-to](http://jlconline.com/how-to)

**JLC**  

---

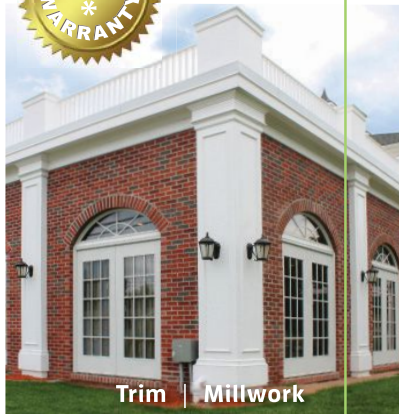
**FIELD GUIDE**

# The Look of Wood without the Worry



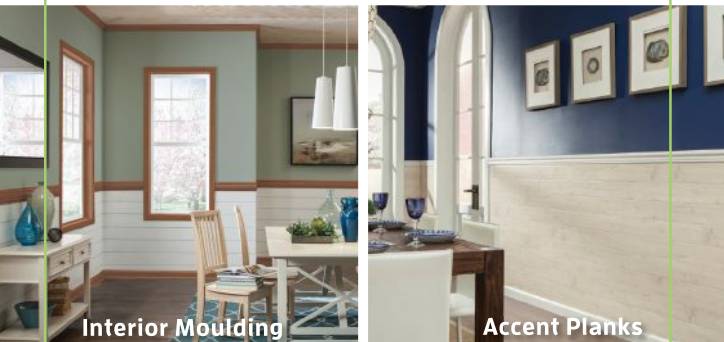
Decor Deck

Decor Porch



Trim | Millwork

- Our products stand up to the elements better than wood
- Unlike wood, our products are already finished saving you time on the job
- Install our products using regular woodworking tools
- A limited lifetime warranty on our PVC products gives you and your customer peace of mind



Interior Moulding

Accent Planks

\* Lifetime Limited Warranty only apply to Deck, Porch, and Trim Products



Deck | Porch | Trim | Millwork | Moulding | Accent Planks

www.inteplastbuild.com  
8 0 0 . 5 2 1 . 4 2 5 9

Made in the U.S.A.



## SALES OFFICES

### HEADQUARTERS

**Rick Strachan** President, Contractor Group  
202.736.3332  
rstrachan@hanleywood.com

**Dan Colunio** Vice President, Sales,  
Remodeling & Distribution Groups  
617.304.7297  
dcolunio@hanleywood.com

### NORTHEAST/MID-ATLANTIC

**Paul Pettersen** Strategic Account Director  
(Including CT, DC, DE, MA, MD, ME,  
NH, NJ, NY, OH, PA, RI, VA, VT, WV)  
516.252.8020  
ppettersen@hanleywood.com

### MIDWEST/ SOUTHEAST

**Ed Kraft** Strategic Account Manager  
(Including AL, FL, GA, IL, KY, MI, NC,  
SC, TN)  
443.445.3488  
ekraft@hanleywood.com

### MIDWEST/SOUTH CENTRAL

**Kay Ross-Baker** Strategic Account Manager  
(Including AR, IA, IL, IN, KS, LA, MN, MO,  
MS, ND, NE, OK, SD, TX, WI)  
773.824.2576  
krossbaker@hanleywood.com

### WEST COAST

**Carol Weinman** Senior Strategic  
Account Director  
(Including AZ, CA, CO, ID, MT, NM, NV,  
OR, UT, WA, WY)  
831.373.6125  
cweinman@hanleywood.com

### NEW ENGLAND REGIONAL EDITION

**Phil Guerra** Account Manager  
516.586.4797  
pguerra@hanleywood.com

### CANADA

**John Magner** York Media Services  
416.598.0101  
jmagner@yorkmedia.net

### CLASSIFIED ADVERTISING

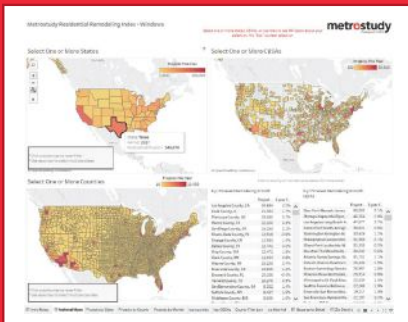
**Maura Jacob** Account Manager  
678.451.8627  
mjacob@hanleywood.com

JLCONLINE.COM



RESIDENTIAL  
**remodeling**  
INDEX

**11.9 MILLION  
REMODELING PROJECTS  
ARE CURRENTLY UNDERWAY FOR 2017**



**HAVE YOU CAPTURED YOUR SHARE OF  
THE REMODELING MARKET?**

Do you know how big your **market opportunity** is? We do.  
Do you know which are **the best markets** for you? We do.  
Do you know where your **target customers** are? We do.  
Do you want to **beat your competition**? We know you do.

**The Residential Remodeling Index** answers these questions and more.

**DON'T GUESS. KNOW.**

Contact us today for your private demo.  
[metrostudy.com/go/remodeling](http://metrostudy.com/go/remodeling)



# Chief Architect®

Smarter Design Software



Design by Michael Rust – Architect LLC  
Rendered in Chief Architect.  
See more of this model online.



## Download a Free Trial Version

Residential Design

Remodeling & Cost Estimating

Kitchen, Bath, & Interior Design

3D Design, Floor Plans, Elevations

Construction Drawings

CAD Tools & Section Details

208.292.3400 • [chiefarchitect.com/FreeTrial](http://chiefarchitect.com/FreeTrial)



## Asphalt Shingling Basics

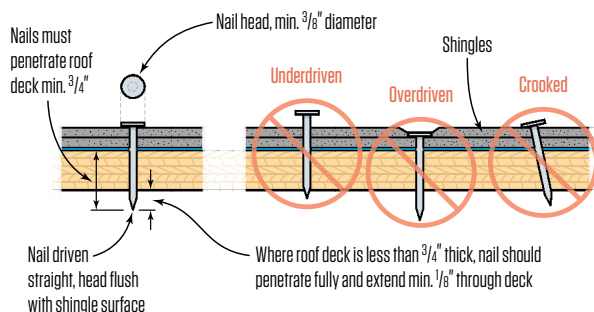
**By most counts**, close to 80% of the roofs in this country are covered with asphalt shingles. They're easy to install, but there are many ways to install them incorrectly. Every bundle of shingles comes with a wrapper that has illustrated installation instructions, and this is the first place to look for specific guidance. In this episode of *Training the Trades*, we explain some general guidelines for installing asphalt shingles.

### NAILING

Driving the nails that hold a shingle on the roof is one of the first things to practice and get right. Start by selecting nails that have a head at least  $\frac{3}{8}$  inch wide and that are long enough to penetrate  $\frac{3}{4}$  inch into the roof deck. (Most manufacturers will specify a minimum-length nail, so read that shingle wrapper.)

Drive the nails so that the head is flush with the shingle surface (see Properly Driven Nails, below left). Nailing depth is especially critical when you are using a pneumatic nailer. Adjust the nailer's air pressure to drive the nails into the sheathing between rafters. Keep an eye on the depth of the nails as you work the gun. When a nail hits framing, it might not penetrate deeply enough, and you will need to drive it flush to the shingle surface by hand.

#### Properly-Driven Nails



Nails are preferred over staples for securing shingles; they have to be driven straight and set to the correct depth (above). Three-tab shingles attach to the roof with four nails: one at each edge and single nails above each slot (above right). In high-wind areas, asphalt shingles fasten with six nails across the nailing margin (right). Additionally, manufacturers may specify dabs of roofing cement; check the wrapper for number and placement.

### OFFSET PATTERNS

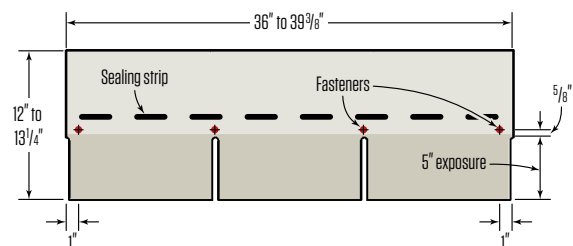
Asphalt shingles come in two basic configurations: three-tab and architectural (or "laminated") shingles. Three-tab shingles are made from one flat layer of asphalt with slits (called "cut-outs") that create three tabs on the exposed portion of the shingle. Architectural shingles are made from multiple layers of asphalt laminated together to give them a more dimensional look. Installation for the two shingle styles is similar, but always review the manufacturer's instructions in case its recommendations vary from the standard procedure outlined here.

Both shingle styles have a sealing strip, and nails should always be kept below this strip for the shingles to seal properly. The allowable nailing area is a fairly narrow band between the top of the tabs and the sealing strip. Place nails as shown in the illustrations below. Drive nails above each cutout as well as 1 inch in from the ends. In high-wind areas, extra nailing is required; refer to the extended lesson at [jlonline.com/training-the-trades/asphalt-shingling-basics](http://jlonline.com/training-the-trades/asphalt-shingling-basics).

### INSTALLING THE SHINGLES

Regardless of style, shingle installation always begins with a "starter course." Manufacturers make shingles especially for this

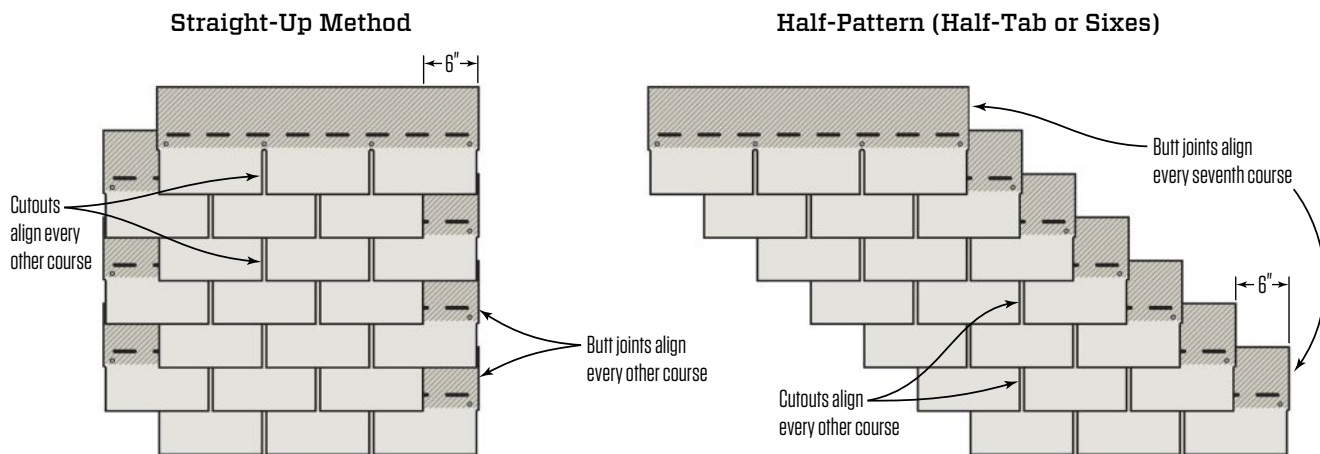
#### Four-Nail Method—Three-Tab Shingles



#### Six-Nail Method—Laminated Shingle (For High-Wind Conditions)



## Shingle Offsets for Three-Tab Shingles



**Two strategies for attaching three-tab shingles.** To ensure that the butt joints between shingles are covered by the course above, the layout needs to stagger from course to course. With the straight-up method (left), the shingles stagger in a straight line up the plane of the roof. With the half-tab method (right), the shingles stagger in stair-step fashion by a half-tab from course to course; with this strategy, shingle tabs line up every other course and butt joints line up every seven courses.

application, but often they will recommend cutting off the exposed part of the shingle and nailing the leftover part of the shingle onto the roof with the edge of the shingle either flush with the drip edge or extending 1/4 inch past.

Asphalt shingles are installed in alternating courses known as an “offset pattern.” There are two common variations for offset patterns for three-tab shingles: straight-up and staggered (see Shingle Offsets for Three-Tab Shingles, above).

With the straight-up pattern, the shingles vary half the width of the tab from course to course in a straight line up the roof. With this method, the butt joints of the shingles align every other course, and there’s a possibility that wind-blown rain can get driven under the shingles.

With the staggered “half tab” pattern, each course of shingles steps a half-tab over from the course below. With this strategy, butt joints only align every seven courses, reducing the chances that wind-blown rain can find its way through. Architectural-style shingles should be staggered according to the manufacturer’s recommendations that come with each bundle.

### TIPS FOR A GOOD-LOOKING ROOF

The trick to keeping courses straight is the same for all styles of shingles. Complete the initial group of five or six courses across

the roof from rake to rake. At both ends of the roof, measure down from the ridge to the top of the cutouts in the finish course. Ideally, those measurements should be the same (or very close) at each end. If not, mark the longer of the measurements at both ends and snap a chalk line between the marks. That line then becomes the guide for the bottom of the next course. Repeat this procedure every half-dozen courses or so; adjusting the courses intermittently will keep the exposure of the shingles running parallel.

When cutting shingles, always cut from the back. Rarely do the shingle courses end precisely on the half-tab distance. Don’t just let the shingles hang over the rake and then trim them all at once at the end. This can result in a ragged edge along the rake and a lot of waste, as usable parts of shingles fall to the ground.

A better strategy is to cut shingles individually to complete each course. You don’t need to measure this distance and transfer it to the shingle. Just set the shingle (or usable scrap) in line to the rake, and make a nick with a razor knife at the top edge of the shingle. Then flip the shingle over to make the cut.

Use a scrap of plywood as a cutting board to avoid cutting and damaging the installed shingles. To keep the rake lines as straight and smooth as possible, use a framing square to guide your cut. Or, use the top corner of a fresh shingle as a straightedge, making sure the razor knife doesn’t cut into this guide shingle.

 For a more detailed discussion on installing asphalt shingling, go to [jlconline.com/training-the-trades/asphalt-shingling-basics](http://jlconline.com/training-the-trades/asphalt-shingling-basics).

# The Decks of Hurricane Alley

by Bryan G. Parker



The North Carolina coast is a beautiful place to live and visit; however, during hurricane season—which runs from June until October—the area is vulnerable to storms that bring high winds and flooding. Sitting in the heart of “Hurricane Alley” is Pleasure Island, a small barrier island just south of Wilmington, N.C., that includes the towns of Carolina and Kure Beach as well as the historic Fort Fisher. Here, most homes have a deck or a porch, whether for embracing ocean and inlet views or simply providing a space to enjoy the warm ocean breezes and salt air. The trick is to build decks that not only look good and function well, but also can weather the occasional storm.

## Design

Oceanfront homes on the island are typically built with the decks facing the

ocean to maximize views of the water. These decks are usually large and encompass the entire width of the home. Often, each level of a home is equipped with a deck, which unfortunately often results in a massive stack of decks.

A way to provide outdoor space while avoiding the “stacked” effect is to incorporate decks into the floor plan of the home. Keith Bloemendaal, owner of Dutch Built Homes, in Carolina Beach, says, “With lot sizes relatively small here, design is critical when trying to maximize outdoor living space. Everyone wants outdoor space. Good design is key to ensuring that space works with the home and not against it.”

On the island, it’s common to extend the main roof structure out over the deck to provide shelter from rain and sun. This is a cost-effective way to improve traffic

**Coastal decks and porches should be designed to take advantage of the summer breezes and engineered to withstand a hurricane.**

flow between indoors and outdoors while maintaining the home’s overall curb appeal. Often these are shallow-pitched hip roofs, which have proven to be less vulnerable to damage from high winds than gable roofs. But shallow-pitched gable roofs are just as common and are sometimes a better solution for porches.

## Construction

A major difference between decks built along the coast and elsewhere is that everything on the coast starts with pilings, either marine-grade treated round timbers or 8x8 PT posts. Because most of the barrier islands off the North Carolina coast are in a floodplain, both houses and



## FORTIFY YOUR ROOF AGAINST THE STORM

When it comes to building in storm-prone areas, a high-performance, sealed roof deck can help protect your home against wind-driven rain. Featuring a built-in water-resistive barrier and taped panel seams, ZIP System® sheathing and tape helps meet resilient building standards by FORTIFIED\* Home™, while reducing installation steps and eliminating the need for felt.

Visit [ZIPSystem.com/Roof](https://ZIPSystem.com/Roof) to learn how to protect your build.

**ZIPsystem™**  
SHEATHING & TAPE

**Q** In Eliot Lothrop's article "Working Safely and Comfortably at Heights" (Mar/18), he talks about a two-rope positioning system. How do these systems work, and are these ropes in addition to the restraint system or in place of it?

**A** Eliot Lothrop, owner of Building Heritage, a timber-frame restoration company in Huntington, Vt., responds: Fall-protection safety equipment falls into two categories—restraint systems and positioning systems—and OSHA makes a clear distinction between the two. A restraint system prevents a worker from falling any distance. A positioning system allows a worker to be supported on an elevated vertical surface such as a wall or roof, and to work with both hands free while leaning against the rope. Further, the positioning system must be rigged so that a worker cannot fall more than 2 feet. In general, I have found OSHA to be accepting of different types of fall-arrest technology as long as manufacturer guidelines are followed.

The two-rope positioning system that I

referred to in the article is a hybrid system in which one rope is the restraint rope while the other is the positioning rope (1). These ropes are attached to the roof framing above the worker position by means of separate OSHA-approved connectors. These connectors are attached to separate framing members, usually a few feet apart.

The restraint rope is the principal fall-arrest or restraint system. We attach the rope to Petzl's ASAP mechanism (2), which moves up and down as the worker changes position. But because the ASAP mechanism allows the rope to move relatively freely, the worker can't lean against it to work hands-free.

That's where the positioning rope comes into play. It is attached to a Petzl RIG device that allows the worker to descend and to lock the rope at desired working height (3). With

**Two-rope positioning.** With this system, the restraint rope is the primary fall-arrest protection, shown here attached to the worker with a Petzl ASAP mobile fall-arrest device. A second rope attaches to the worker with a Petzl RIG device. With this device, the worker can lock the rope so he can lean against it, leaving both hands free to work. Separate attachment points for the two ropes allow the worker to triangulate his working position without having to work against one rope or the other.

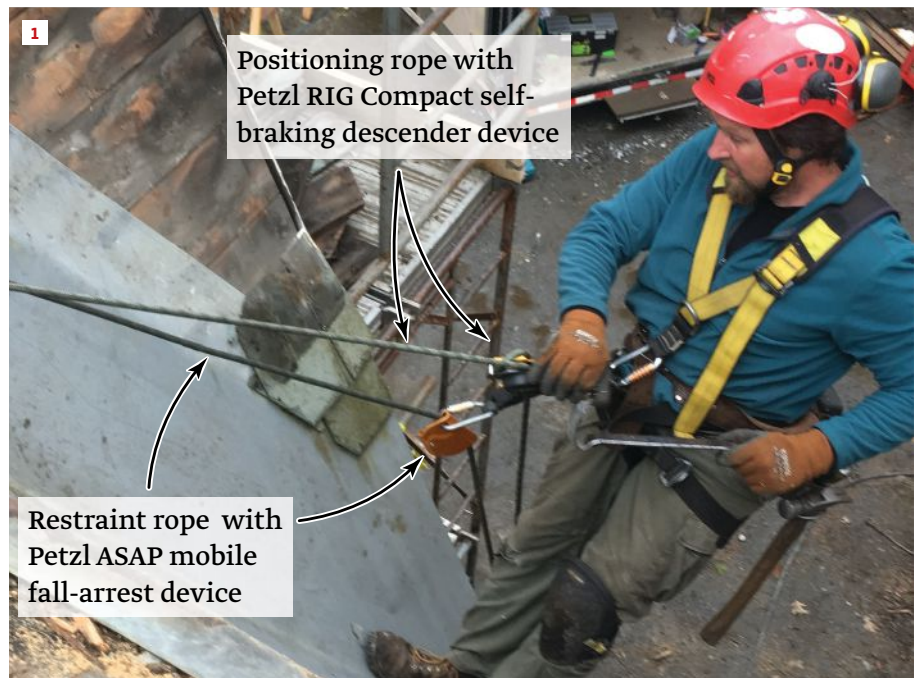


Photo: Eliot Lothrop

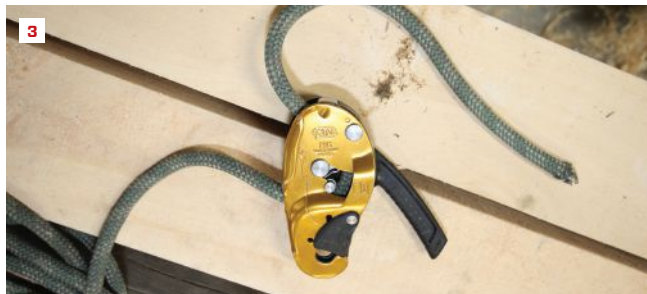
## Q&A / Two-Rope Positioning System

the rope locked, the worker can lean against it with both hands free for working.

As the article says, the whole system begins with a Petzl full-body AVAO harness. The harness has two D-rings in the front. Typically, we attach the positioning rope to the upper D-ring and the restraint apparatus to the lower D-ring. Having the attachment points in different locations above the worker allows him to use the two ropes to triangulate his location and to work without fighting one rope or the other.

Working at extreme heights is serious business and we literally trust our lives to the fall-arrest equipment. We regularly inspect the ropes for any signs of wear and replace any rope that is worn, cut, or abraded—even superficially. Manufacturer guidelines say the ropes and harnesses typically have a lifespan of about five years.

We also frequently check the RIG and ASAP devices to make sure that no sharp edges are developing that could damage the ropes. If cleaning of the RIG or ASAP devices is needed, Petzl recommends that they be washed with lukewarm soapy water and then rinsed with fresh tap water. Chemical cleaners or degreasers should never be used. Finally, we treat the harnesses and all the various devices as valued tools, keeping them off the ground and putting them in a case when not in use.



The Petzl ASAP device (gold device at the end) moves up and down the rope as the position of the worker changes (2). If a fall occurs, it locks in position instantly. The RIG device at the bottom allows the worker to lock himself in position and lean against the rope for working with both hands free (3).

Photos: Tim Healey

## Give the Dryer Some Space

# the dryerbox®

## Room to Breathe

Today, you can place the dryer flush to the wall without crushing the exhaust hose or otherwise restricting airflow. Install the Dryerbox® for safer, roomier and more efficient homes.



**NEW** Standard Installation Model 480  
22 Gauge Aluminized Steel—Shown Painted

**In-O-Vate**  
Technologies Inc

888-443-7937  
[www.Dryerbox.com](http://www.Dryerbox.com)



# Reroof. Replace. Redefine your profits.

Earn up to \$800 more  
by replacing old skylights with a VELUX No Leak Solar  
Powered "Fresh Air" Skylight during reroofing.

Replacing skylights during reroofing is not only easier and more convenient, but our 10-year installation and product warranty gives your customer peace of mind while also allowing you to ensure the whole roof. Visit [skylightoffers.com/reroofing](https://skylightoffers.com/reroofing) to download your free how-to replacement guide.

# The craftsmanship is obvious. The fasteners are not.



Try Cortex® for Decking today **FREE!** Cortex combines the strength of a deck screw with the great finished look of a hidden fastener.

The Cortex Hidden Fastening System is the fastest, easiest way to hide deck screws across the entire deck, first and last boards, perimeters and stairs. Cortex plugs are made from the same material as the deck board so you get a great finished look with the holding power of a face-fastened connection.

- Plugs available for major deck board brands and colors
- Available nationwide
- Package includes screws, plugs, and setting tool

**FREE STARTER PACK!**

Scan the QR or visit [www.fastenmaster.com/trycortexdeck](http://www.fastenmaster.com/trycortexdeck)



 **FastenMaster**  
PRO Driven



[FastenMaster.com](http://FastenMaster.com) 800-518-3569



This floor was out of level by a full inch in one direction (1), and by  $\frac{3}{4}$  inch in the other (2). Before the leveler can be mixed and poured, the author applies liquid primer to the underlayment (3).

## Pouring a Level Floor for Tile

BY TOM MEEHAN

**Severely out-of-level floors** are a fact of life in the New England homes that I work in. For a tile setter, these floors can be a nightmare—especially when the project calls for large-format tile that requires the subfloor to be within  $\frac{1}{8}$  inch of flat and level in 10 feet (“Working With Large-Format Floor Tile,” Nov/17).

Recently, clients asked me to install large-format tile on the floor of an L-shaped bathroom that they were remodeling and expanding with a new walk-in shower. When I arrived at the project, the carpenters had already installed the plywood underlayment, but I could tell at a glance that the outside corner of the L was very high. A long level confirmed that the floor dipped a whopping 1 inch in about 4 feet in the direction of the toilet and shower (1), and more than  $\frac{3}{4}$  inch toward the entry door (2).

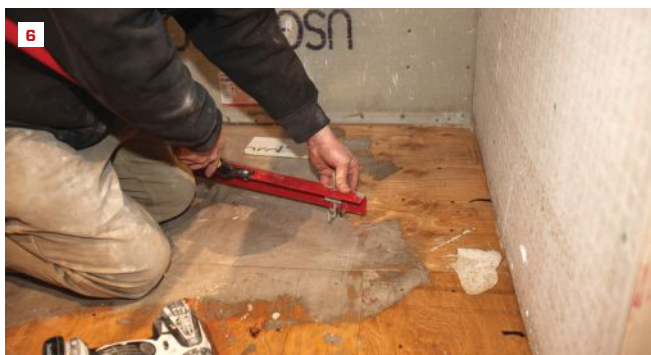
**New options.** In the past, my options would have been limited. If the deviations were  $\frac{1}{4}$  inch or less, I could have built up low spots with layers of thinset. In an extreme case such as this project, I would have had to do a full mortar bed, which is messy and time consuming. Instead, I opted to use one of the self-leveling underlayment products now on the market.

Self-leveling concrete products have been around since the late 1970s. The product I used, Ardex Self-Leveling Backerboard, is a polymer-modified, Portland-cement-based product that mixes with water and is then poured onto the low areas of the floor. It has high compressive strength, making it ideal for installation under tile floors, and it can be feathered into the high areas, maintaining strength and adhesion as it approaches zero thickness.

Before I could mix and pour the self-leveling compound, the subfloor had to be primed with Ardex P51, a milky liquid that I applied to the subfloor with a coarse broom (3). Ardex says that the primer should be allowed to dry a minimum of three hours and a maximum of 24 hours before you mix and apply the self-leveling compound.

Self-leveling underlayment products are not cheap. We used four 50-pound bags for this particular floor at just under \$50 per bag. In addition, the primer cost about \$70 per gallon jug. This price may seem a bit steep to some, but the time it saved me was invaluable. And in one pretty simple and quick operation (shown in the photos on the following two pages), I was able to form a strong, solid substrate for the tile floor that was level, flat, and perfectly smooth.

*Tom Meehan, co-author of Working with Tile, is a second-generation tile installer who lives and works in Harwich, Mass.*



Liquid leveler will seep through any opening left uncovered. Here, expanding foam fills in around a plumbing stub, and tape forms a dam around the toilet flange (4). The author drives a screw as a depth gauge for the liquid (5) and uses the screw to set the height of the gauge rake (6). Because the existing threshold wasn't high enough to contain the leveler, the author screwed in a temporary dam between the door jambs (7). A stone threshold will be added later to transition to the tiled bathroom floor.



The manufacturer requires that the inside of the mixing bucket be rinsed thoroughly to prevent the plastic from absorbing liquid from the mix (8). A taller, narrower bucket is typically used for mixing the leveler, but this bucket was all that the author had on hand. Water for the mix must be measured accurately (9). Instructions require that the leveler be mixed with a mixing paddle for no less than two minutes (10). Then the mix must slake for five minutes and be quickly remixed before pouring.



Two crew members dump the initial bucket of mix in the corner where the compound will be the deepest (11). The author wears protective boots as he spreads the first batch with the gauge rake (12). The leveling liquid fills the lowest corner with the head of the depth screw (visible as a small white dot) flush with the surface of the leveler (13). Smaller, subsequent batches fill the low area in front of the bathroom door (14), and the author uses a squeegee to feather the liquid up to the high corner (15). To leave the bathroom, the author had to take one step into the liquid, but it quickly filled back in around his footprint. The entire pour took only 15 minutes and the self-leveling liquid did the rest, providing a solid, flat, and level substrate for the tile floor. As a side note, the author covered the floor with an uncoupling membrane before installing the large-format floor tile.

# Working With WarmBoard

BY ROB CORBO

**Last year**, we got a chance to use WarmBoard on two projects. The first was over a slab-on-grade foundation for an addition on an inner-city row house. Ordinarily, we like to build out additions over crawlspaces for better access to mechanicals, but to save money, our clients opted for a slab-on-grade foundation. The architect's design called for a radiant floor in the large family room that would span from the existing home into the addition, and the architect spec'd WarmBoard-S over the new slab.

Using WarmBoard allowed us to run the hydronic tubing on top of the slab, instead of embedding the tubing in the concrete and having to heat the slab's mass. The WarmBoard system includes a nailing substrate that simplified installation of a new engineered-wood finish floor spec'd for that room. The installation went well; so well in fact, the architect spec'd WarmBoard for a second project—a bump-out addition that we did after the completion of the first project.

In this article, I'll provide a quick overview on our experiences installing WarmBoard—a product we highly recommend using—over both concrete **(1)** and a wood-framed floor **(2)**.

For radiant heating, we've had luck over the years installing Uponor's Joist Trak aluminum heat-transfer panels to the underside of new and existing subflooring (packing the joist bays with insulation and enclosing with drywall, to drive the heat upward). But, with the switch to a reinforced slab with XPS sub-slab insulation, we had to come up with a different system for installing radiant heat.

## TWO PANEL CHOICES

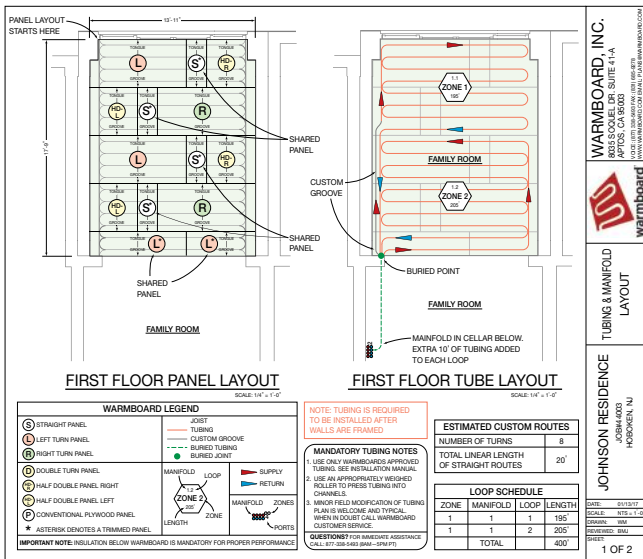
WarmBoard comes in two thicknesses, 1<sup>1</sup>/<sub>8</sub>-inch Warmboard-S structural plywood panel and 1<sup>3</sup>/<sub>16</sub>-inch-thick Warmboard-R panel, which is an OSB product. The WarmBoard-S panel is usually installed in new construction or additions (serving a dual function as a structural subfloor and radiant panel) **(3)**, while the thinner WarmBoard-R is used more for remodeling projects **(4)**.

Both WarmBoard products have 12-inch-on-center channels routed into the surface to receive 1/2-inch radiant tubing. And both products come with a 0.025-inch-thick, factory-applied aluminum conductive surface over the panel. WarmBoard's literature claims this conductive surface is roughly five times more conductive



The author installed WarmBoard-S on two different, back-to-back addition projects: first, over concrete **(1)**, and then, over a framed-floor assembly **(2)**. WarmBoard comes in two panel types; WarmBoard-S **(3)** is a 1<sup>1</sup>/<sub>8</sub>-inch-thick structural plywood subfloor that doubles as the radiant panel, while WarmBoard-R **(4)** is a thinner, OSB product for use as an overlay to an existing floor.

Photos 1, 2, 5, 8, 9, and 10 by Rob Corbo



than radiant systems embedded in concrete, and the system reportedly delivers a much faster response and more even temperatures.

### MANUFACTURER-SUPPLIED DESIGN

For both projects shown here, we used WarmBoard-S. Over the framed floor, its thickness is needed as a structural subfloor, but even on the slab project, we wanted the extra thickness to help line up the new floor with the existing one. We also felt it would be a better nailing substrate for our finished floor.

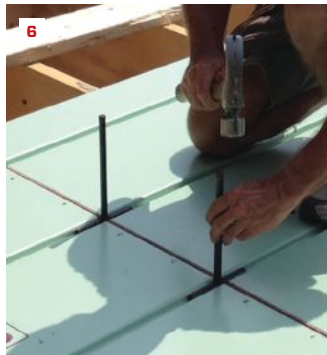
WarmBoard-S comes in 4-by-8-foot panels with tongue-and-groove edges. (The Warmboard-R product comes in smaller, 2-by-8-foot panels.) To facilitate lining up the channel patterns on adjacent panels, WarmBoard-S comes in a few different panel types—straight, left, right, and double. (Warmboard-R only comes in only two panel types: “straight” and “turn.”)

As part of its service, WarmBoard can supply you with a design tailored to your project’s needs. This includes layout plans, one for the panel layout and one for the radiant tubing. We sent the company our project plans, and for around \$200, it sent us a WarmBoard layout, detailing all the steps to assembling the system (see layout plan, top left). The cost was credited back to us once we purchased the materials.

Our small, bump-out addition over a wood-framed floor was simple in terms of a layout, and plans were not required. But for the larger slab project, the panel layout plan was an enormous help in puzzling through the panel installation. The layout plan shows the panel sequencing—where to install the left turn, right turn, and straight panels, and which “shared” panels to cut. It also clearly showed where we needed to start so the sequencing would work out.

The “floor tube” layout plan also was a big help on the slab project. This plan specifies the number of zones, and on the slab project, we had two zones—Z-1 required 195 feet of tubing and Z-2 needed 205 feet. (Generally, for estimating the tubing, the maximum length for a zone is about 200 feet.) The tube layout drawing also specified “bury points” (holes where tubing submerges beneath the WarmBoard panels) and the manifold location. For the slab project, we had bury points near the house end of the slab where it planed into the framed first floor of the house over the cellar. The manifold was located in the cellar near the boiler.

While the different panels with standardized channels for tubing make up most of the floor, most projects will require some custom routing to make the layout work. The tube layout shows where this work is needed, and it is definitely the most interesting part of the installation.



As part of its service, WarmBoard provides panel and tubing layout plans (top). The panel plan guides the installation of the 4x8 T&G WarmBoard-S panels, while the tubing plan notes the designated pathways for the 1/2-inch PEX. An installation kit is shipped with the panels (5). This kit includes the plans, alignment pins to line up the tubing channels (6), and routing templates to make custom grooves (7).

For this work, WarmBoard sends an installation kit, which includes wooden templates for routing three different types of grooves—180-degree, straight, and offset. The kit also includes router bits, alignment pins, and other necessary accessories. Cutting is done with a router from the back of the panel with the aluminum side down. It takes a little figuring out the first time through, but it didn't take an inordinate amount of time for our lead carpenter, Danny DoCouto, to make the necessary modifications. As shown on the tube layout drawing (see previous page), custom routing was needed on only four panels for the slab project.

### PANEL INSTALLATION

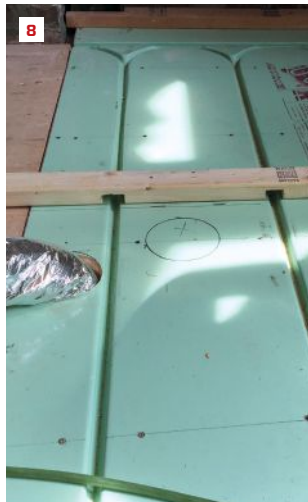
On the slab project, we first covered the concrete with 6-mil poly, then loose-fit the WarmBoard-S panels, cutting panels to size as needed. As we fastened down the panels, we used nails to gap the panels  $\frac{1}{8}$  inch on the 4-foot side. We also used the alignment pins from the installation kit to keep the channels in line. We fastened the panels with  $2\frac{1}{4}$ -by- $\frac{1}{4}$ -inch flat-head Tapcons, spaced 6 inches on-center along panel edges and 12-inches on-center in the field. Over the framed floor, we secured the WarmBoard-S with panel adhesive and  $2\frac{3}{4}$ -inch screws, using the same fastener spacing.

Once all the standard-configuration panels were installed, we routed our custom grooves and secured those panels to the slab. We had to deburr the routed aluminum edges and clean off any adhesive squeeze-out in the channels while it was still fresh.

After mechanical rough-in, we covered the panels with hardboard for protection. We waited as long as possible before installing the tubing to avoid damage during the rest of the renovation. To make this happen, we dadoed the bottom plate for a powder-room wall on the bump-out addition. This way we could fish the tubing in just before we were ready for the finish flooring.

*Rob Corbo is a building contractor based in Elizabeth, N.J.*

Rough-in locations were marked on the panel with a Sharpie, and interior wall plates were dadoed to allow fishing the PEX tubing in later, so tubing could be installed as late in the remodeling process as possible (8). PEX supply and return lines connect to the manifold in the cellar via “bury point” holes in the WarmBoard (9). Engineered wood flooring acclimates in preparation for installation (10). New flooring gets installed directly over panels. No rosin-sized slip-sheet required, and the installer has a clear view of the piping to avoid punctures (11).



*Outdoor Accents*<sup>®</sup>

**Easy on the eyes. Easy to install.**



Hangers



Gable Plates



Ties



Fasteners



Post Bases



Angles



Straps

Introducing the complete line of **Outdoor Accents**<sup>®</sup> decorative hardware. Easily add beauty and strength to your outdoor projects. The new Simpson Strong-Tie<sup>®</sup> Outdoor Accents line of structural connectors features an innovative screw and washer that together combine the ease of installing a screw with the look of a bolt. And, with a black powder-coat finish, this hardware offers style that's designed to last.

To see our full line of decorative hardware, visit us at [go.strongtie.com/outdooraccents](http://go.strongtie.com/outdooraccents) or call (800) 999-5099.

**SIMPSON**

**Strong-Tie**<sup>®</sup>

---

## Controlling Humidity in Warm Climates

**Without air conditioning**, life as we know it in the warmer parts of the United States would be hard to imagine. Air conditioning may not be an absolute necessity, even on the Gulf Coast, but it might as well be: Today, the majority of new homes nationwide, and virtually 100% of new homes in the South, get central air conditioning systems.

And there's a reason it's called "air conditioning" and not just "cooling." Air conditioners dry the air at the same time they cool it. By improving comfort, controlling indoor humidity reduces the need for cooling. It's also important for building durability, because moisture can damage the building envelope. In addition, evidence is piling up that controlling humidity is important for human health.

Building consultant and mechanical systems engineer Kristof Irwin, a principal at Positive Energy in Austin, Texas, stressed the health-based case for humidity control in a recent interview with *JLC*. "What is the main output of your house?" asked Irwin. "It's healthy, productive human beings. The main output is you. So all the stuff we do around buildings really should be around you. And the main thing I need to do for you is to deliver healthy air for you to breathe."

Excessive humidity threatens that healthy air quality, Irwin argued. In a moist indoor environment, fungi and bacteria flourish, he said: "Those two are mortal enemies, and they continually fight for turf using chemical and biological warfare." The toxins produced in that turf war, Irwin said, are harmful to people. So in a damp house, people can become collateral-damage casualties in a microbe-on-microbe war.

"In building science," said Irwin, "it might be safer and friendlier to talk about moisture accumulation in materials, and 'should we do a vapor retarder,' etc.—but it's much more important to talk about upper respiratory infections, asthma, and sleep apnea." For support, Irwin pointed to a 2016 report called *Microbiomes of the Built Environment*, from the National Academies of Sciences, Engineering, and Medicine. "There's a table in that book, where down the left side it lists all these health issues," he said—things like wheezing, coughing, respiratory infections, or allergic rhinitis. Across the top, the table



Above, an Ultra-Aire 155H dehumidifier sits next to the air handler of a 6-ton geothermal heat pump, part of a whole-house climate-control system designed by Austin-based Positive Energy. The unit can remove as much as 155 pints of water at 7 pints per kWh and can effectively dehumidify air as cool as 56°F, according to Ultra-Aire specifications.

Photos by Tom Dugan

BY TED CUSHMAN



This Ultra-Aire SD12 split-system dehumidifier's indoor coil (top) and outdoor coil (above) were installed at the home of David Treleven, who has since started working for Ultra-Aire maker Therma-Stor. The unit gives Treleven's Passive House dry air without adding excess heat to the living space.

lists broad-based medical literature reviews published in 2004, 2009, and 2011. "By 2011," said Irwin, "for every major issue they looked at, sufficient evidence existed to show correlation" between a damp indoor environment and negative health symptoms.

"As an industry, we've forgotten about the occupants of our buildings," said Irwin. "And as soon as I put the occupants in, it is super important to keep air dry in a humid climate. So this is the elephant in the room that I design for. I'm going to put a system in there dedicated to controlling humidity, that I can count on, that's simple and controllable. You take the other stuff off the table."

#### MAKING SYSTEMS WORK

Air conditioners remove "sensible" heat (the heat you can feel in the form of air temperature) as well as "latent heat" (the heat that's contained in the form of evaporated moisture in the air). But during the spring and fall "shoulder seasons" in a place like Louisiana or Texas, when only latent cooling (dehumidification) is needed, traditional air conditioning struggles to get the air-drying job done without overcooling the space.

Louisiana State University (LSU) professor Claudette Reichel made the point in simple language in a 2012 YouTube video for the university's LaHouse demonstration home: "You want to build tight and vent right. You need good-quality fresh air," said Reichel. "But when we bring in fresh air, we are bringing in excess humidity. You do want to dehumidify. But there's not much need for cooling in a very energy-efficient home. So the air conditioner may not run enough to take out that humidity. So the ultimate is to separate air conditioning and dehumidification, especially for the spring and the fall."

This is not a new message. As far back as 2005, building scientists Armin Rudd, Joe Lstiburek, and Kohta Ueno brought clarity to the issue in a report for the Department of Energy (DOE) Building America program, *Residential Dehumidification Systems Research for Hot-Humid Climates*. After testing and monitoring 20 different homes and evaluating various strategies for maintaining acceptable indoor conditions, the team summed up this way: "Energy efficiency measures, combined with controlled mechanical ventilation, change the sensible and latent cooling load fractions such that supplemental dehumidification, in addition to that provided by the central cooling system, is required to maintain indoor relative humidity below 60% throughout the year. The

system providing the best overall value, including humidity control, first cost, and operating cost, involved a standard dehumidifier located in a hall closet with a louvered door and central-fan-integrated supply ventilation with fan cycling.”

The team’s conclusion is as true as ever. In the 15 years since Rudd, Lstiburek, and Ueno conducted their Houston study, building envelopes have continued to get tighter and better insulated. Windows have also improved, and strategies such as shading have continued to reduce sensible heating loads. And mechanical fresh-air-supply ventilation, with its associated humidity load, has become, if anything, even more important.

At the same time, however, HVAC equipment has evolved. Today’s most advanced cooling equipment has variable control of fan and compressor operation. Compared with earlier generations of air conditioners, it does a better job of adapting to changing sensible and latent load conditions, hour by hour and day by day.

But even the best cooling equipment has limits. Said Irwin: “The reality is that when you don’t have much of a cooling load at all, you don’t need your air conditioner to run. But you still could need substantial drying. And in that situation, asking either a mini-split or a central cooling system to just dry your air without overcooling does not work. Some manufacturers have told me, ‘Oh, if you have variable refrigerant flow (VRF) equipment, you don’t need a dedicated dehumidifier.’ But I have found that not to be true. Good luck drying something without overcooling it.”

Kimberly Llewellyn, who worked with Kristof Irwin for six years at Positive Energy and is now a Performance Construction Manager with mini-split-heat-pump-maker Mitsubishi, told *JLC* that Mitsubishi is clear with builders that its cooling equipment needs help any time the space doesn’t call for much sensible cooling. “In partial load conditions,” she explained, “the coil is generally not running cold enough to effectively dehumidify. If you are in peak load conditions, it does a great job at removing humidity. But whenever you are at partial load conditions, then you are running at partial capacity, which means that the coil is warmer.”

Although she works for an equipment supplier now, Llewellyn said, “I’m on a high-performance construction team. I still consider projects holistically. So while I am helping project teams—owners, developers, engineers—understand where HVAC fits in to the whole picture, we do have to talk about the whole picture.”

That picture’s not complete without dehumidification, Llewellyn said. During spring and fall in many parts of the country, she explained, “outdoor ambient conditions have absolute humidity above what we are trying to maintain inside. And when you’re introducing constant ventilation loads into a house, well, then you’ve got this whole other load that you have to address. So dehumidification is really the only answer at this point.”

“Some of the builders I talk to think that putting a dehumidifier in the house is a Band-Aid,” said Therma-Stor’s Nikki Krueger. “That’s wrong. You’ve tightened up the house as much as possible, which is good; so you’re bringing in fresh-air ventilation, as you should. You sized the air conditioning system according to best practices. If you need a dehumidifier, it’s because you did everything right.”

### PIECING SOLUTIONS TOGETHER

In the commercial market, vendors have started to provide equipment that can cool air down enough to dry it out, then reheat the delivered air stream to return it to design temperatures for people in the space. But on the residential side, no single company today makes both the cooling equipment and the dehumidification gear to solve the shoulder-season humidity problem in houses.

That means designers and contractors need to custom-craft solutions that mix and match equipment from different companies, and devise control systems that can effectively manage the whole shebang. A fairly widespread approach is to choose an air conditioner for cooling—either a central system or one or more mini-split heat pumps—and team up that cooling equipment with a dehumidifier for air drying and an energy recovery ventilator (ERV) for fresh air.

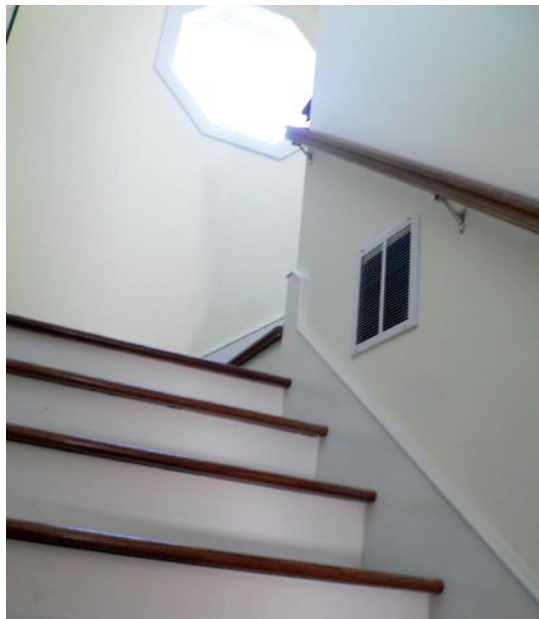
On some days during the hottest part of the year, the air conditioner alone may adequately control humidity as well as temperature. The ERV will also help, in any season, by passing moisture from the incoming air stream to the exhaust stream. But for many hours out of the year (especially in spring and fall), the dehumidifier will shoulder a load that the home’s other equipment can’t handle.

“In the high-performance market, this hybrid integrated approach using all three systems, often utilizing integrated duct systems, is common,” said Mitsubishi’s Llewellyn. “And with projects that are determined to be high performance, there’s a fairly high tolerance for putting systems together, or having to figure it out.”



North Carolina builder Tom Dugan installed this Ultra-Aire 70H in his own home. The unit is rated at 70 pints per day and 5 pints per kWh. Dugan tied the dehumidifier into his already installed fan-powered air-mixing duct, which sends air from the home’s highest point down to the ground level.

Photos courtesy Positive Energy



A grille at the peak of Dugan's top-story living room draws air into the dehumidifier (top) whenever the dehumidistat activates it. An always-on air-mixing fan pushes the dried air down to a basement stairwell register (above).

Llewellyn's team at Mitsubishi communicates often with companies that manufacture ERVs or dehumidifiers and is happy to point builders and developers toward those vendors, she said.

There is no "typical" solution yet, Llewellyn said. But in a house with relatively high loads, one approach that seems to work well is to tie a dehumidifier into the ductwork for the central air conditioner, as seen on page 26. The dried air is mixed into cooled air coming out of the air conditioner's cooling coil, and sent out to the house.

But there's a hitch. When standard dehumidifiers condense moisture out of the air, they do it by taking heat out of the water vapor. That "heat of evaporation" goes back into the home's air in the form of sensible heat: That is, it raises the temperature. In a highly insulated airtight building in the South, the warm air produced by a dehumidifier can be a problem, no matter how you mix it in. So for houses with very low sensible loads, designers are now likely to choose a "split" dehumidifier, which sends heat from the indoor coil to an outdoor condenser coil and fan, using warm refrigerant. The Ultra-Aire SD12, shown on page 27, was the first split dehumidifier unit on the market; David Treleven, who worked at the time for Advanced Energy in Raleigh, N.C., installed one when he built his own Passive House. (Treleven now works for Therma-Stor.)

Architect Corey Saft built the first certified Passive House in Louisiana in 2010, equipped with a mini-split heat pump and an Ultra-Aire dehumidifier. "They said the dehumidifier would only raise the air temperature in the house 2°F," said Saft, "and that was true—on average. But it raised the outgoing air stream 10°F." When the Ultra-Aire SD12 split dehumidifier came onto the market, Saft swapped one in to the building. That took some load off the home's heat pumps, he told *JLC*. In fact, he said, the SD12 provides more than 4,000 Btu/hr of cooling—enough to carry the home's entire cooling load for much of the cooling season, without the mini-split. Saft is now designing his second Louisiana Passive House, with help from Passive House consultant John Semmelhack and with Positive Energy on the team as the HVAC designer. The home will have two ducted mini-splits, two SD12 dehumidifiers tied into the mini-split ductwork, and an ERV.

But you don't have to get that fancy. One step above the "dehumidifier in a closet" is the solution implemented by North Carolina builder Tom Dugan for his own home. Dugan's house is cooled with a ducted mini-split, but he knew that hot, humid air would tend to accumulate at the open-plan building's peak in the upstairs living room. So when he built the house, his HVAC contractor lined one stud bay in the home's elevator shaft with metal duct material and installed a fan to pull air from the home's peak down to the entry stairwell at ground level. Later, Dugan tied a dehumidifier into the air-mixing system, with a dehumidistat at the upper story's peak. A simple meter on Dugan's desk tells him the relative humidity in the living space. "We've had some really foggy cool mornings this spring," Dugan told *JLC* in April. "It's sitting right at 100% dew point and it's 60°F outside, and right now my indoor humidity is 45%. I say, OK. I like that."

*Ted Cushman is a senior editor at JLC.*

**NEW**

**RIKON**

# Portability

## A must for your work shop and job sites!

RIKON's portable, benchtop planer and jointer are the perfect machines for surfacing lumber, whether in the workshop or on the job site.



### 13" PLANER (25-130H)

- Powerful 15 amp motor
- Motor Speed (No Load) 22,000 RPM
- 6 Row segmented Cutterhead with 26 HSS 2-edge insert cutters
- Easy cutterhead access for changing of dull or nicked knives
- Planer table easily adjusts in height with large control handles
- Only 73 lbs.

### FEATURES



Helical-Style Cutterhead



Large 14" x 12" extension tables



STEEL STAND (25-410) Optional



### 6" JOINTER (20-600H)

- Reliable 10 amp motor
- Motor Speed (No Load) 20,000 RPM
- 6 Row segmented Cutterhead
- 12 HSS, 2-edge insert cutters for super cutting action
- Easy knife changes
- Adjustable fence that tilts from 90° to 45° quickly and accurately
- Portable 36 lbs.

### FEATURES



Helical-Style Cutterhead



Fence tilts from 90° to 45°



Call today for more information **877-884-5167**  
or visit **www.rikontools.com** for a dealer near you!



# PAINTING



## Superb Paint-Grade Finishes Pro tips for a flawless, durable finish for interior trim

BY SCOTT BURT

Folks in the trades argue in jest all the time about which trade is the most important. We, of course, argue that it's the painters because we get the last shot at making a house shine—literally and figuratively. Beautifully painted finishes on interior trim don't happen by accident, but they aren't rocket science either. These eye-popping finishes happen most efficiently when specific steps are followed with meticulous attention to detail.

Our company has been painting homes for decades, and we're also out there helping to train the next generation of painters. For this article, we use our "classroom" mock-up to show the steps that are key to smooth and beautiful painted trim.

### Filling and Sanding

#### START WITH THE NAIL HOLES

Fastening trim is not usually the responsibility of the paint crew, but painting is quite often the job of finish carpenters, especially remodelers. I always recommend that carpenters set their nails to about  $\frac{1}{16}$  inch below the surface of the wood. That depth gives the nail good purchase to hold the trim in place while also being easy to fill in one pass of the putty knife, without having to pack filler in. The deeper the hole, the more filler it requires and the more times it will need to be skimmed to fill it completely.

Photos by Tim Healey

In addition to emphasizing the importance of the proper fastener depth, I try to school carpenters to stay away from driving fasteners into the architectural details of the molding profile. Nail holes on the flat or on gently curved sections of the molding are much easier to fill and sand smooth.

When filling holes, I use light- to medium-bodied fillers because they are easy to sand down evenly. My filler of choice is 3M Patch Plus Primer, which is good for interior and exterior applications. I shy away from hard fillers such as epoxy except in cases where the filler will be exposed to extreme weather conditions or wear. These hard fillers are difficult to sand smoothly.

On the flat sections of the molding, I use a narrow, flexible putty knife to fill fastener holes (1). I push the filler into the hole but then leave plenty on the surface; that way, the hole won't need to be filled a second time when the filler shrinks (2). If there are fastener holes in a grooved part of the molding, I use my little finger as a putty knife (3). For holes in tight grooves, such as next to an edge bead, the pointed end of a 5-in-1 tool works well.

Don't try to be too neat when filling holes. If you try to scrape off all the excess filler, what's left can dimple or shrink slightly as it dries and will require further skimming. Instead, I like to pack the hole until it bulges and leave a proud layer on top. Then I sand it down when the filler has dried—usually within about a half-hour.

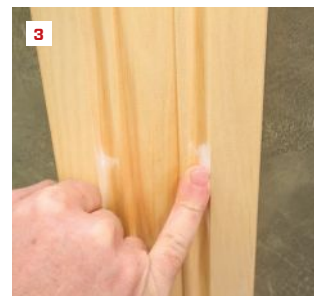
## MULTI-TASK SANDING

The old adage is that painting is 90% prep work, and much of that prep work involves sanding. It is important to do as much sanding as possible at one time to streamline the prep work. The first and most obvious things to sand are the nail holes that we just filled. Lightweight spackle sands down to the wood surface fairly quickly, but be sure to sand as much of the filler residue as possible from the wood. Any filler that remains will absorb the paint differently and cause flash or a difference in the sheen at that spot.

The next thing that sanding takes care of is mill glaze, which is the sheen left on the wood surface from planing and shaping. The surface of the wood can get burnished by sharp cutters, and that burnishing, or glaze, has to be removed so that the primer adheres properly. This glazing varies with the grain in a board and might not be readily visible, so you may need to sight down the trim with a work light. Sanding off the glaze prepares the surface of the wood for the primer.

The third thing I try to do when sanding is break the hard, sharp edges of the trim or the profile. Paint will adhere much better to an edge that has been rounded off slightly.

Finally, I sand down any roughness or raised grain in the wood that might have come from the milling process.



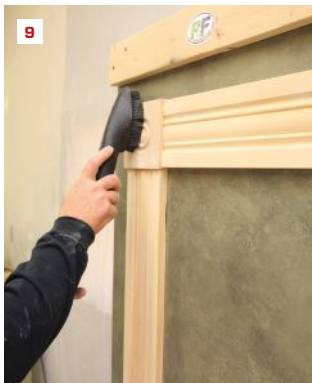
**Filling holes.** The author uses a flexible putty knife to fill the fastener holes with light- to medium-bodied filler (1). He leaves plenty of filler on the surface so that the filled hole can be sanded rather than filled a second time (2). In the grooved areas of the molding, he fills fastener holes with his little finger (3).



**Power sanding.** Sanding with machines allows the addition of a dust-collection system. Here, a sander with a flat sanding pad works on a filled hole (4). Linear profile sanders with different-shaped attachments work well on trim details such as grooves (5).



**Hand sanding.** Hand sanding leaves more dust, but it is the best way to sand details such as the circles in a rosette (6). Slightly breaking the sharp edges of the trim helps with paint adhesion, and hand sanding is best for this task (7). Folding sandpaper to a sharp crease can be effective for smoothing out the narrow grooves of a trim profile (8).



**Dust removal.** Even with a dust-collection system, a thorough cleaning is mandatory for a smooth paint job. The author first goes over the surface of the trim with a vacuum and soft brush (9). Then he wipes down all surfaces with a damp rag to remove any residue that the vacuum missed (10).

Trim features such as rosettes are notorious for having rough areas where milling has exposed the end grain.

### HAND SANDING VS. POWER SANDING

A question that I am often asked is whether I prefer machine sanding over hand sanding, but this is not an either-or question. Power sanding is definitely quicker and more thorough for flat areas of trim (4). Linear profile sanders can get into some of the grooves in the profile on straight runs of trim (5). But the best part of machine sanding is dust collection. The vacuum system on the Festool sanders I use eliminates 95% of the dust.

Hand sanding creates a lot of dust, but it's necessary for details that a power sander can't manage, such as curved profile parts or the circular features of a rosette (6). I recommend using hand abrasives to break the sharp edges of the trim (7), at least until you become confident with using a machine sander. For hand sanding, I use Festool Granat paper that has padded backing. The grit is flexible enough that you can fold the paper to a sharp crease for sanding sharp lines (8). I use this paper for much of my sanding between coats of paint.

One crucial thing to remember—whether sanding by machine or by hand—is to use progressively finer grits of sandpaper when building finishes. You don't need to use every grit from 40 to 400, but in a three-coat system for interior work, I generally begin with 120 or 150, then progress to 240, and end with 320.

### FINAL DUSTING BEFORE PRIMER

Dust is always one of our biggest enemies when we're painting trim, so I go over every surface of the trim carefully with a soft brush attachment on my vacuum (9). I make sure to clean deeply into every groove in the profile with the brush bristles.

I do a final wipe-down of the trim with a damp rag (10). I like to use a lightweight, lint-free rag. I dip it into clean water and then wring it out thoroughly. You want it damp enough to help pick up the rest of the surface dust without getting the surface wet, which would raise the grain.

There are tack cloths on the market, but I caution against using them. Wiping down a surface with a tack cloth can leave residue from the oils or wax that are used to make the cloth sticky. That residue will affect how the layers of paint adhere to the surface as well creating variations in the sheen of the paint.

## Priming, Sanding, and Caulking

### BRUSHING IN A LOGICAL PROGRESSION

Primer is an essential foundation for the entire paint system. It is usually dead flat with no sheen, so there is no

danger of it flashing through the finish coats if you apply it correctly. Better primers are formulated to provide superior adhesion and to hide all the work—filling and sanding—that has happened up to that point. I have tried a few of the all-in-one (primer and finish) paint products on the market, but in my experience, there is no substitute for the three-coat system: a coat of primer followed by two coats of finish paint.

When painting windows and doors, I try to work from the top down and from the jamb or stop bead out. So on installed trim, the first surface that I brush is the top edge of the head casing, cutting in carefully along the joint between the casing and the wall surface (11). I apply a liberal coat of primer, but not so heavy that it drips or runs. Then I do the bottom edge.

Next, I brush the face of the head casing (12), starting at the edge of the rosette and pulling the brush toward the center of the casing. The idea is to break the trim package into each component and isolate the faces for brushing. This is easier than trying to brush both edges and the face of a piece at the same time.

When the head casing is done, I move to the rosette in the corner of the casing (13). I repeat the same sequence, painting the edges of the rosette and then the face. I brush the circular detail carefully, making sure that I apply a solid coat to all edges of every circular facet. From there, I repeat the steps on the jamb casing below the rosette (14). Had this been a full casing, I would have turned to the rosette and jamb casing on the opposite side before painting the sill and apron—again generally applying the paint in a top-down direction.

## SCUFF SANDING THE PRIMER

No matter what type of primer you use, it is going to feel like it has raised the grain a little bit on the wood, so scuff sanding the primer is a must (15). Give the primer adequate time to dry, and then hand-sand the trim, starting with a finer-grit (180) paper before moving up to 240. Develop a light touch when sanding the primer to avoid breaking through the paint to bare wood. If that happens, you will need to sand down the entire area again and re-prime it to prevent the subsequent coats from flashing where you broke through.

Get into the habit of carefully inspecting all the surfaces with a work light to make sure that they are consistently smooth and even (16). I use a hand-held LED light; it is bright and casts a neutral color, but it doesn't get too hot to handle, like other types of work lights. I'm particularly on the lookout for filled holes that might have dimpled slightly. I hit any spots like that with a light dab of filler before sanding them down.

Before going any further, I run over the surface thoroughly with a vacuum and brush to remove as much dust



**Priming.** All coats of paint, including primer, should be brushed on in a deliberate sequence. The author begins at the top edge of the head casing (11), then brushes the bottom edge and the face (12). Next, he moves to the rosette, painting the edges first and then the face (13). Finally, he paints the vertical trim pieces (14). If this had been a complete casing, he would have finished with the sill and apron.



**Scuffing the primer.** Applying primer raises the grain on a wood surface, so light sanding is always required before finish coats. The author scuffs over every surface with fine-grit sand paper, taking care not to break through the painted surface (15). A small but powerful LED light helps him sight down all painted surfaces as he looks for areas that need to be sanded (16). When he is satisfied, he vacuums the entire trim area and finishes by wiping everything down with a damp rag (17).



**Caulking.** After applying a bead of caulk, the author uses his finger to initially smooth the joint (18). Then he wraps a damp cloth around his finger and makes several passes (19), until the final pass leaves the wall and trim surfaces clean with just a smooth and neat fillet of caulk filling the joint (20). After cleaning each joint, he rinses the cloth in clean water and wrings it out thoroughly for the next joint (21).



**Detail caulking.** A painter's 5-in-1 tool becomes a handy putty knife for caulking hard-to-reach detail areas around the molding. For flat, or square, surfaces, the square edge of the tool works well to fill the joint (22). For tight and narrow areas such as the groove on this molding profile, the pointed end of the 5-in-1 tool works best for tooling the caulked joint (23).

as possible. And as before, I give every surface of the trim a final wipe down using a clean damp cloth (17).

## CAULKING

There is always some debate on the proper time to caulk, but in my experience, you should always caulk after the primer and before the finish coats. If you caulk over bare wood (before priming), the wood can suck the moisture out of the caulk and cause it to crack. On the other hand, you want to bury the caulk in as many coats of paint as possible, so the best time to caulk is after priming.

I always insist on using a high-quality acrylic-latex caulk. (We like DAP Alex Plus, a good all-purpose acrylic latex plus silicone.) Always let the caulking dry completely before painting over it. Painting over uncured caulk is a sure-fire recipe for cracked caulk.

Keep a wet rag in your hand when caulking. Snip the nozzle on the tube to open a tiny hole in the tip (less than 1/8-inch diameter). As with applying paint, I try to work from the top down. I begin with a bead of caulk along the top edge of the trim and wipe the joint immediately with a wet finger, removing most of the caulk (18). From there, I wrap the damp cloth around my finger and go back over the joint a couple of times (19). Each pass cleans the wall and the surface of the trim a bit more until all the excess residue is gone (20). When I'm satisfied with the caulked joint, I rinse my rag thoroughly in clean water before going to the next joint (21).

For the mock-up in the photos, I continued to work around the perimeter of the trim, using the same procedure with my finger and the damp cloth. Using the 5-in-1 tool, I go back and clean up the outside corner of the rosette where the two lines of caulking meet. When the inside and outside edges are caulked and clean, I caulk the joint where the casing meets the rosette. This caulk joint follows the profile of the casing, so it's a little trickier.

I apply the bead of caulk and wipe easily-accessible areas with my finger. Then I use the square corner on the blade of my 5-in-1 tool as a miniature putty knife to tool the bead neatly along the profile of the molding (22). For the narrowest grooves, I flip the tool over and tool the joint with the pointed end of the blade (23). When all the joints have been caulked, I inspect every surface carefully with a work light. When white caulk is used over white primer, small ridges of residue might not show up until the light casts a shadow.

## Applying the Finish Coats

### PROGRESSIVELY THINNER FINISH COATS

The finish coats of paint should not be as thick as the primer coat. Each coat in a three-coat system should be slightly thinner than the previous coat. For the finish



**First coat of finish paint.** Working in the same deliberate sequence as before, the author applies the initial coat of finish paint. He begins each section by painting the edges and then finishes that section by carefully brushing the face. He starts with the head casing (24), then the rosette (25) and jamb casing (26), and finally the sill and apron (on a full window). As he brushes on the paint, he uses a hand-held LED light to look carefully at the sheen of the paint to gauge whether the coat is even (27). Brush strokes should always run in the same direction as the grain of the trim.

coats, I like the paint itself to be less viscous than the primer. Finish paint should drip readily off the stir stick.

For all coats of paint, it's important to use a professional-quality brush. My go-to brush for painting trim is a 2-inch, medium-stiff angled-bristle brush (see "Paintbrushes," Mar/15). After a thorough stirring, I'm ready to start applying the finish coats. If you are working out of a can of paint that is not new, be sure to strain the paint.

As you apply each layer of paint, get in the habit of loading the brush properly. Dip the brush about halfway up the bristles. Then tap each side of the brush against the side of the can to load the brush. This action forces paint into the voids between the bristles and allows you to carry more paint from the can to the trim. Dipping and scraping just puts paint on the outside of the brush, which is a much less efficient delivery system.

## FINISH PAINT ADDS THE SHEEN

I apply the finish coats of paint in the same sequence as the primer, starting at the top edge of the head casing and working

one section of trim at a time (24, 25, 26). I brush on the paint in the same direction as the grain of the trim.

Because the primer was dead flat and then sanded, there should be no sheen at all on the trim before finish paint goes on. As I apply the paint, I use the sheen of the wet finish paint as the guiding factor to make sure I have even coverage. In other words, I look more at the sheen or the shininess of the wet paint than I do at any change of color from one coat to the next. This way I can ensure that there are no gaps, or holidays.

There is a limited working time when applying paint. After completing one or two sections of trim, I grab my light and sight across the areas of wet paint (27). As I sight down a section of trim, I am specifically looking for areas where the sheen is not consistent.

Here is where loading the brush properly and getting paint on the trim efficiently comes into play. It's imperative to sight down the trim and correct any problem areas while the paint is still wet, and if you have applied the paint quickly and efficiently, then you



**The final coat.** The author scuffs the first coat of paint with 320-grit sand paper (28). The object is to just dull the surface and to carefully avoid sanding through the layer of paint. He then brushes on the paint in the same sequence as before, starting with the head casing (29), continuing with the jamb casing (30), and finishing with the sill and apron. While the paint is still wet, he sights every surface with a hand-held LED light, and corrects any problems before the paint begins to dry (31).



stand a greater chance of inspecting and correcting the surface before the paint starts to tack up. If you wait too long and try to correct a problem after the paint begins to dry, you will end up creating a mess and you will have to redo earlier steps in the process to fix it.

### SCUFF SAND BETWEEN COATS

Be sure to let the paint dry completely before you go any further. Be aware that temperature and humidity can affect how quickly paint will dry. As with the primer coat, the first finish coat should be sanded before the next coat goes on (28). For this step, I use 320 grit or finer, with a very light touch.

The coat of finish paint is thin, and the object here is to just dull the sheen, which gives the surface a final smoothing and preps the surface for better adhesion for the final coat. As with the previous steps, I vacuum the surface with a soft brush, followed by a wipe down with a damp rag. I also sight down the surface one last time before reopening the can of finish paint.

### THE FINAL COAT

The last coat of finish paint that we brush on is even thinner than the first coat, so it is likely to dry more quickly than the first coat. For that reason, I pay even closer attention to getting the paint on the trim efficiently—it's the final lay down for the painter and the surface that the clients will be looking at every day (29, 30).

Again, I work a top-down sequence, beginning with the head casing and then working in deliberate fashion on the jamb casings. As with the earlier coats of paint, I sight down the finished sections while the paint is still wet (31), making absolutely sure that the sheen is consistent on all surfaces and that the brush work is straight. This all but guarantees that when the final coat of paint dries, the surface of the trim will be seamless and smooth with a consistent amount of gloss in all areas.

*Scott Burt owns Topcoat Finishes (802paint.com) in Jericho, VT., and is a partner in Prep to Finish (preptofinish.com), teaching classes about painting.*

# Cedar Impressions®

As an industry innovator, CertainTeed is constantly creating new features to improve product performance. CertainTeed **Cedar Impressions** polymer siding leads the way in new product innovation delivering an industry first – CedarLife™ blended color throughout.

an industry

# FIRST



engineered to

# LAST

CedarLife™ Color Blends capture the appearance of natural Eastern White Cedar and Western Red Cedar at various life stages, remaining fresh and beautiful for a lifetime.

Siding: Cedar Impressions Individual 5"  
Sawmill Shingles in cedar blend balanced mix  
Trim: Restoration Millwork®



NATURAL BLEND

DRIFTWOOD BLEND

CEDAR BLEND

RUSTIC BLEND

800-233-8990 • [www.certainteed.com](http://www.certainteed.com) • <http://blog.certainteed.com>

ROOFING • SIDING • TRIM • DECKING • RAILING • FENCE  
GYPSUM • CEILINGS • INSULATION

**CertainTeed**  
SAINT-GOBAIN

# ENERGY



## High-Efficacy Lighting New technology offers promise—and peril

BY TED CUSHMAN

**H**ow many builders does it take to change a light bulb? Answer: None. LED lamps never need changing, and anyway, LED light fixtures don't use bulbs.

OK, we're not there quite yet. But the no-light-bulb world is coming, and ready or not, it's time to embrace the future. And while LED lighting may have been over-hyped (for example, the truth is that even LED lamps do eventually need replacing), incandescent light, including halogen lighting, is on its way out.

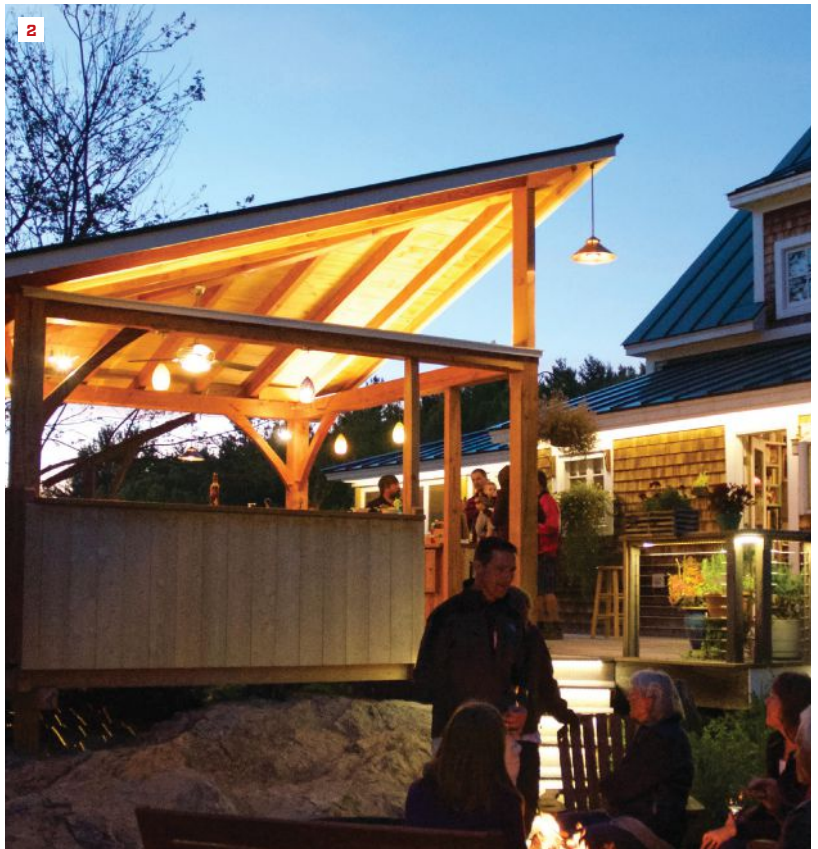
The 2018 International Energy Conservation Code (IECC) requires 90% of all lamps in new construction to be "high efficacy" (defined in light output per watt of power input). Incandescent bulbs

don't qualify, and neither do halogens. To comply, your options using currently available technology boil down to fluorescent lamps or LEDs. And since most consumers do not like fluorescent lighting, your best bet is almost always going to be LEDs.

In California, the rules are stricter than the national model code: "Appendix JA-8," a lighting rule that's part of that state's Title 24 energy code, now requires 100% of all lamps in a new home to be high efficacy. Appendix JA-8 also mandates a whole slew of other quality standards for lighting fixtures ("luminaires") and lamps, including tests for longevity and light color quality.

The IECC national model code tends to get tougher over time.

Photos by Tim Mathiesen and Sergio Mazon



**Sensitive and sensible.** LED lights can provide beautiful and functional illumination in a full range of color temperatures and intensities, to support any aspect of life in a home. The LED chandeliers and pendants Tim Mathieson used in the vaulted living space above (1) mix well with daylight; warm outdoor lights (2) enhance an evening cookout. On page 39, LEDs in a hanging rail fixture use a quarter of the wattage of the halogen bulbs they replaced, while supplying the kitchen with better light.

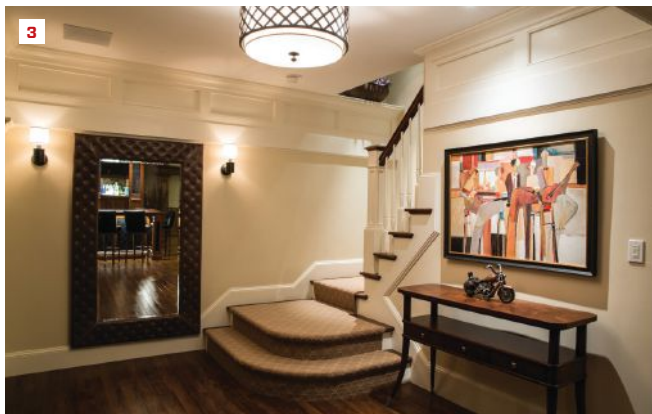
Eventually, all lamping in all new homes throughout the nation will likely have to be high efficacy. Someday, the national standards may even encompass quality measures similar to the California requirements too. But in any case, California's economy is so big and influential that the national industry is already moving to qualify with Appendix JA-8. So California's vision of high efficacy, coupled with high light quality, is already being felt nationwide. And although the 2018 IECC won't take effect for years in many states, LED technology is advancing so fast that LED products are often the best practical choice anyway, in many cases.

If you want to get with the program, it's time to start learning about LEDs. Even though he's not in California, Boston lighting designer Sergio Mazon ([mazonlighting.com](http://mazonlighting.com)) told *JLC*, "100% of my work right now is LEDs. I still think incandescent and halogen lights are beautiful, but I don't design with them anymore."

## "EVERY PROJECT DESERVES GOOD LIGHTING"

Compared with incandescent and halogen lights, LEDs are a whole different animal. Incandescents and halogens are made with metal filaments that warm up when electric current is passed through them. Electrical resistance makes the filaments hot, and they get bright. That light emission, called "black-body radiation," is a fundamentally different physical process than the solid-state functioning of a light-emitting diode. An LED fixture can give you "as much" light as an old-school Edison light bulb. But the quality of the light is not the same. And people can tell the difference.

With careful selection and installation, LEDs can give you results as pleasing as any illumination that incandescents and halogens can provide—or even better. But you have to know what you're doing. In 2013, for example, experts from multinational lighting firm Osram re-lit the ceiling of the Sistine Chapel in Rome, with



**Lighting a lifestyle.** Sergio Mazon's custom lighting design specified LED luminaires for the basement living space, including a ceiling pendant, wall sconces, and accent lighting for art work in the entry (3), accent lights and downlights for the bar (4), cove lighting and art lighting for the billiard room (5), and color-tunable lights for the home gym (6), suitable for either a vigorous morning workout or a relaxing evening yoga session.

its centuries-old Michelangelo fresco paintings, using 7,000 LED lamps. The results are breathtaking. But you can be sure that the Vatican did not purchase the cheapest LED fixtures they could find at their local home center to light up the room where they gather to select the next Pope.

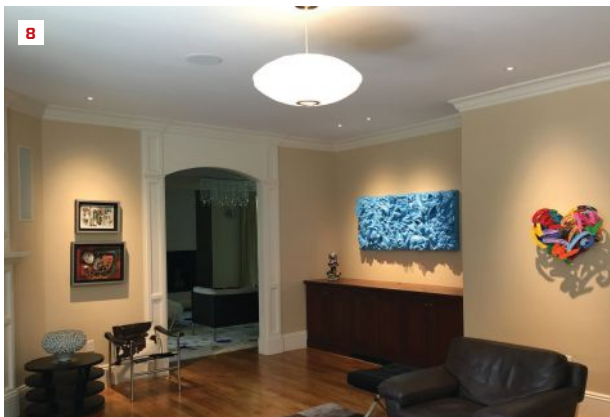
To get good lighting, builders need to put time and thought into it. Vermont lighting designer Tim Mathiesen ([brilliant-ldi.com](http://brilliant-ldi.com)) told *JLC*, "Every project at every budget requires and deserves really good lighting. The budget does not have to be expansive to make lighting look good. But it does have to be considered. And LED technology, at this time, should always be a part of the conversation. It can be the major factor in providing great lighting." As the industry advances, said Mathiesen, "we're free to design an entire house to use LED. And that definitely has moved beyond what the code is talking about."

But the devil is in the details—and even for an expert, LEDs are a challenging technology. "LED is a mess right now," Sergio Mazon told *JLC*. "Yes, we can design energy efficiently, provide a good amount of light with comfort and ambiance, and full dimming, 100% with LEDs. They're small, they go everywhere, they save energy, and they're helping us do a lot of things we were not able to do before. But if people go to the home center and buy an LED retrofit lamp for two bucks, when they bring it home, it's cool, it's blue, and then it flickers, and then it turns off ... LEDs are creating a lot of nightmares. And the cheap ones are giving LEDs a bad reputation. Bad products can give an entire technology a bad name."

It's important to stick with reputable brands, Tim Mathiesen said, "the bigger and better manufacturers who have been in it for a long time already, like Cree, and Philips, and Soraa." In addition, in a market where technology is changing fast, and cheap



7



8



9

**Sound and vision.** Homeowners called Sergio Mazon for help when the buzzing of halogen transformers became intolerable. The job turned into a complete LED-based makeover that included tearing out the ceilings to relocate fixtures. The solution, which cut energy use by more than 60%, included hanging pendants for area illumination (7, 8) and small, discreet recessed fixtures aimed at featured artworks (8, 9).

knockoffs are everywhere, consulting with a lighting expert can make all the difference.

## THE TROUBLE WITH LED LIGHTS

Early generations of LED lighting didn't live up to the hype, Tim Mathiesen said. "When Cree started releasing LED replacement A-lamps, I started buying them, and at that point the company was saying, 'Oh, yeah, 20,000 hours, no problem.' Well, I had bulbs that were failing after 150 hours. That's because we were still not good at manufacturing the bulb itself. The LED still worked, but the bulb was falling apart. That's not happening any more. Now we have bulbs that are lasting thousands and thousands of hours, and that will only continue to increase as the manufacturers get better at what they do."

But build quality and longevity are not the only concerns a

consumer might have with LED products. All sorts of performance factors can affect the consumer experience, and most of them are complicated enough to be hard for the non-expert to deal with.

**Color rendering.** The human eye is very sensitive to color, and human beings evolved to see things by sunlight. Many artificial lights don't produce the full "daylight" spectrum—and depending on what you're trying to look at, the partial spectrum they do produce can be disappointing.

Professor Michael Siminovitch directs the California Lighting Technology Center (CLTC) at UC Davis. Siminovitch pushed successfully to have the Color Rendering Index (CRI) included in the state's Appendix JA-8 lighting standard. JA-8 now requires a CRI rating of 90 or better and an "R9" rating of 50 or better. (The R9 value relates to lighting in the red part of the spectrum, which helps people see things like skin tone, or food in a kitchen.)



**Lively serenity.** Expert touches in this Sergio Mazon lighting project help this house work and feel better: Wall sconces sit behind the TV so as not to cast glare on the screen (10); accent lighting makes artwork pop (11); and bright kitchen lighting provides a well-lit workspace while avoiding glare (12).

Consumer disappointment with compact fluorescent lamps based on their flat color rendering has created resistance in the market to the whole idea of high-efficacy lighting, Siminovitch told *JLC*; one goal of the new JA-8 standard is to make the light in a home pleasing for people. “We wanted to ensure that consumers were going to have a positive experience with their lighting system,” he said. “There are faces, meat, wood, et cetera, and we know that anything less than 90 CRI is an absolute disaster. People spend \$5,000 on cabinets, and then they put in an Energy Star lamp that has no red in it, and they wonder why their cabinets look like crap.”

Vendors have responded: Few products on the market today rate lower than 80 CRI, and many 90-CRI (and better) lamps and fixtures are hitting the market. But the CRI standard itself is decades old—“outdated science,” a Department of Energy fact sheet remarked in 2016. “Two sources with the same CRI value can render

colors very differently,” the fact sheet says, “even to the point where a scene looks appealing under one source and unappealing under the other.” On the other hand, commented Sergio Mazon, “Some things that are 80 CRI are actually very good.”

DOE introduced a more sophisticated Color Rendering Index called TM-30 in 2015, but so far, the new system is just a voluntary tool. Meantime, no standard or rule can replace the subjective expertise of experienced lighting designers—or the preferences of their customers.

**Dimming.** Old-school incandescents got dimmer as the power put through them dropped. At the same time, their color would get warmer, turning from white to yellow to gold.

LED lights dim differently: Their light output decreases as their electronic controllers chop off part of the power wave entering the diode. The earliest versions didn’t change color as they got dimmer;



**A flash from the past.** This Sergio Mazon project, which dates back many years, shows the challenge designers face when trying to replicate traditional styles. The chandeliers in this kitchen (13) and hallway (14) have halogen bulbs, as do the hallway sconces. LED replacements for the 15-watt lamps are available, but Mazon said, “No LED is going to replicate incandescent or halogen precisely.”

they stayed white all the way down. Newer products can “dim to warm” using various strategies, but there can still be trouble. The lights may flicker visibly—or they may flicker at a rate you can’t see with the naked eye, but that you may see as a strobing effect when you’re looking at a spinning fan or taking a cellphone video. Even at full power, said Sergio Mazon, some line-voltage LED products may strobe in response to the 60Hz waveform of household current. Avoiding this effect, especially in cases where pulsing lights may interfere with other equipment, takes a specialist.

### HIRE A “GEEK”

Any builder can certainly light a whole house using LED fixtures and lamps, knowing nothing at all about it, with affordable products from the local home center. Any electrician could handle the wiring and installation work, and even supply the lights. But

would your homeowners be happy with the result?

A good lighting designer will be able to put technical knowledge to work in the service of a design aesthetic. “I’m a geek, and I’m good,” said Sergio Mazon. “I can make it beautiful, but I’m constantly keeping myself up to date with the technology, looking at products, reading the spec sheets. So your dimmers are not going to make your LED flicker, and your lights will dim all the way down, with the color consistency the same.”

Although he’s a trained architect himself, Mazon said, “Lighting designers don’t have a style. Architects do. Interior designers do. Lighting designers make whatever is thrown to them beautiful and efficient, and comfortable. My thing is not to put my style there. It’s to be able to get that style into the best design for that client.”

*Ted Cushman is a senior editor at JLC.*

## Current Problem:



Poor airflow resulting in callbacks

## EZ Solution:



Optimized airflow means fewer callbacks

## Terminate callbacks

Save time and money with pre-soffit installation

As you know, fewer trips to the job site means a better bottom line. Current practices and products for venting fans at the soffit can lead to poor system performance. The new **EZ Soffit Vent** from Panasonic is the only HVI certified termination system that lets you complete all the ducting before the soffit is installed. This helps you obtain optimal airflow, so you get fewer callbacks resulting in lower costs. It also eliminates water intrusion costs associated with roof and/or wall terminations. EZ Soffit Vent can be rotated to align with duct work and a low resistance back damper eliminates drafts and improves blower door test results.

Discover smarter solutions at [us.panasonic.com/ventfans](https://us.panasonic.com/ventfans)



**EZSoffitVent™**

Follow Us!



@PanasonicIAQ



# SAKRETE + SPEED

CONCRETE YOU CAN COUNT ON.



## FINISH FASTER.

When you're committed to your trade, you deserve quality products and innovation that saves you time and gets the job done fast. Experience long-lasting results in just 30 minutes with Sakrete's Fast Setting Concrete Mix and feel confident as you move on to your next project. Get started with our easy-to-use online concrete calculator.



[SAKRETE.COM](http://SAKRETE.COM)

# professional deck builder

May 2018



PHOTO: MIKE GUERTIN

**7** READERS' TIPS

**13** EYE FOR DESIGN

**21** DECK LEDGER

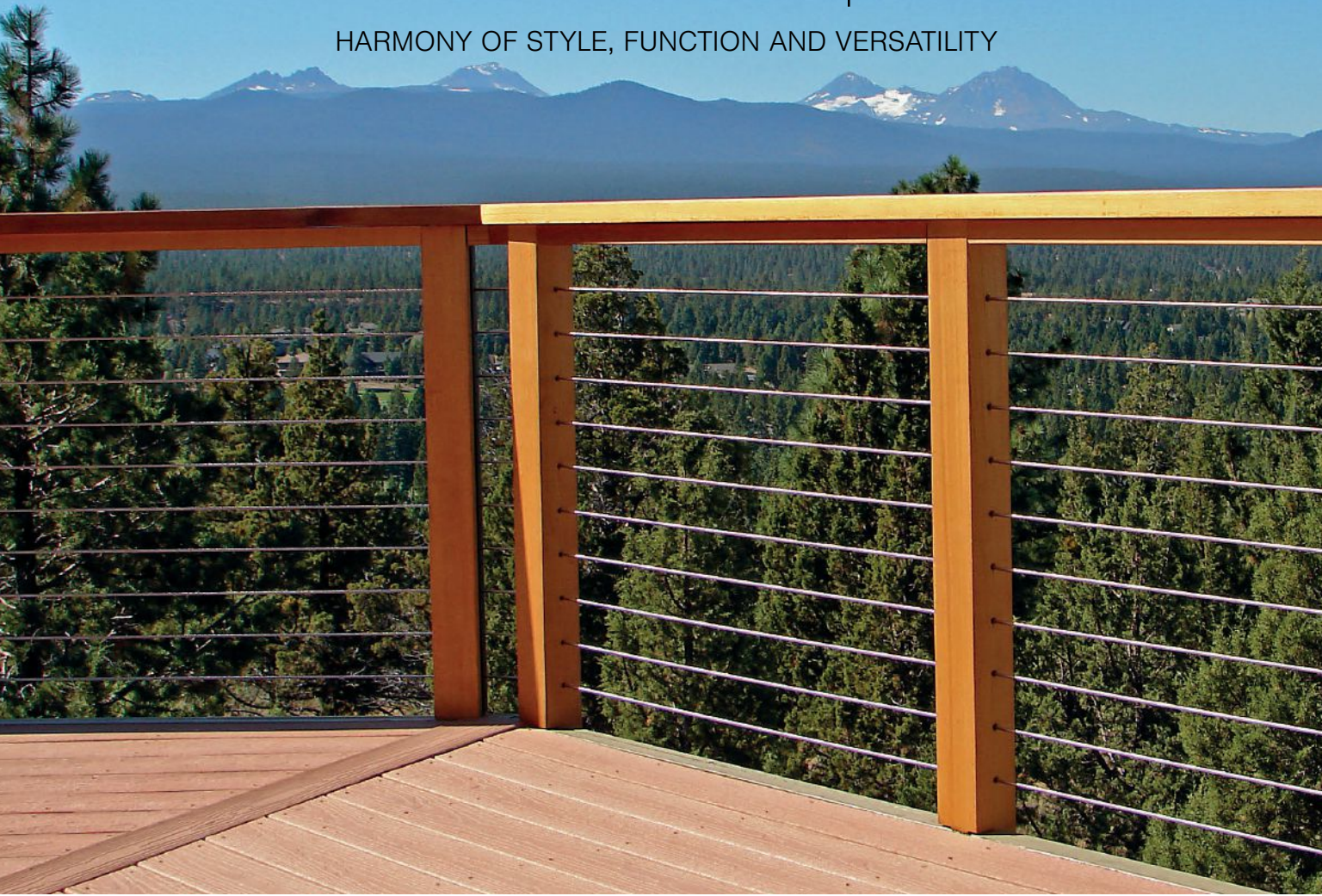
**27** BUILDING A STONE DECK

**35** BRACKETED DECK STAIRS

**42** DAY'S END

# Ultra Simple

HARMONY OF STYLE, FUNCTION AND VERSATILITY



YOUR SOURCE FOR EASY TO INSTALL CABLE RAILING

## Ultra-tec<sup>®</sup>

### CABLE RAILING



USA  
Manufacturer



LEED<sup>®</sup>  
Credits

ISO 9001  
QMI-SAI Global

#### Commercial and Residential Applications

- ▶ Easy to install and customize
- ▶ Virtually maintenance-free
- ▶ Type 316 high-quality stainless steel fittings
- ▶ All fittings manufactured in the United States
- ▶ Engineered for **wood, metal, sleeved, and concrete** installations

VISIT: [WWW.ULTRA-TEC.COM](http://WWW.ULTRA-TEC.COM) | CALL: 800.851.2961



**MoistureShield**<sup>™</sup>  
COMPOSITE DECKING

**BRAVE THE ELEMENTS.**

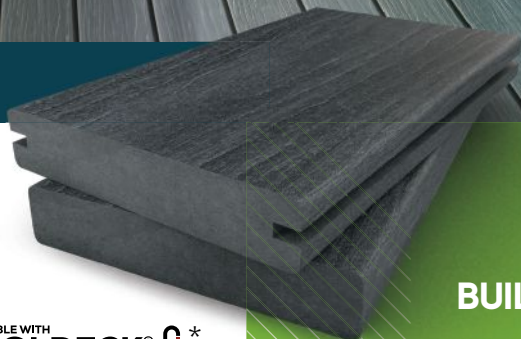


## What Separates Us From the Rest?

MoistureShield<sup>®</sup> is the only decking that can be installed on the ground, in the ground, or even underwater, without voiding the lifetime warranty. Don't worry about the elements ... **MoistureShield is protected to the core.**

[moistureshield.com](http://moistureshield.com) | 1.866.729.2378

© 2018 MoistureShield<sup>®</sup> is part of the Architectural Products Group of Oldcastle  
\*CoolDeck<sup>®</sup> is available on select Vision and Infuse boards.



AVAILABLE WITH  
**COOLDECK<sup>®</sup>**  
TECHNOLOGY \*

**BUILD BOLDLY.**

# MEET CODE. LOWER COST.



**ThruLOK delivers the strength of a through-bolted connection in seconds.**

When you frame a deck, you want connections that are strong and meet code. That's why we engineered and tested ThruLOK to meet the most recent IBC and IRC requirements for guardrail post to rim joist connections.

ThruLOK's innovation is that it delivers this strength without pre-drilling. The fastener drives in seconds with a standard drill or impact driver.

Visit [fastenmaster.com/products/lok-line](http://fastenmaster.com/products/lok-line) to see how strong and fast ThruLOK is.



## ThruLOK® Carriage & Through-Bolt Replacement

FastenMaster® and ThruLOK® are registered trademarks of OMG Inc. Copyright © 2017 OMG, Inc. All rights reserved.



## BRAVE THE ELEMENTS.

MoistureShield® composite decks have always provided a unique combination of rich beauty and proven performance. Now the next generation of decking is here. Discover our innovative advancements and diverse colors designed to fit various tastes, lifestyles and budgets.

### MoistureShield® Vision®

The latest innovation in composite decking, bringing the hardwood look of a home's inside to the outside.

- Lifetime structural warranty protected to the core
- Limited Lifetime Fade and Stain Warranty
- Available with and without CoolDeck® technology
- Modern, variegated appearance, available in 5 beautiful colors

### MoistureShield® Refine®

An enhanced capped board that is a perfect balance of true wood beauty and high performance durability.

- Industry Leading Transferable Lifetime Warranty
- 25 Year Fade and Stain Warranty
- Rich, natural colors and variegation, available in 2 colors

### MoistureShield® Infuse®

An innovative co-extruded capped board that looks like wood.

- Transferable Lifetime Warranty
- 25 Year Fade and Stain Warranty
- Available with innovative CoolDeck technology
- Enhanced color palette of deep earth tones, available in 5 colors

### MoistureShield® Vantage®

A traditional uncapped board that has the workability of wood, but the durability of a composite.

- Lifetime Warranty
- Reversible board with natural wood-grain texture on both sides
- Natural weathering, available in 8 colors

**NEVER COMPROMISE.** Choose a deck built on performance, personalization and protection. Choose MoistureShield.

For samples, visit [moistureshield.com/elements](https://moistureshield.com/elements) | 1.866.729.2378



**BUILD BOLDLY.**



Decking: Transcend® in Spiced Rum  
 © 2018 Trex Company, Inc. All Rights Reserved. Trex® is a federally registered trademark of Trex Company, Inc., Winchester, VA.

## Introducing what's next from Trex.

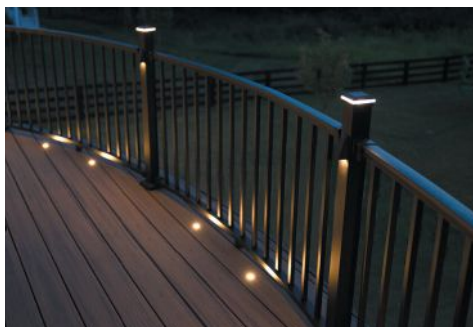
Now there's a good reason to cut the cord when it comes to cable railing. New Trex® Signature™ Rod Rail offers faster assembly and lower maintenance when compared to cable. Plus, its ability to deliver unobstructed views makes it the clear choice for your next build. To learn more, visit [trex.com](http://trex.com).



Engineering What's Next  
 in Outdoor Living®



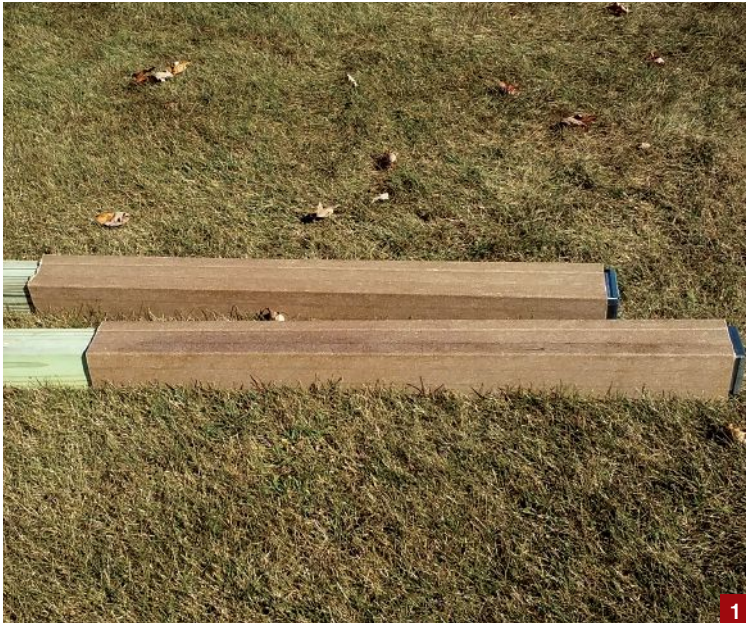
Trex Signature™ Rod Rail



Trex Signature™ Aluminum Railing



Trex Transcend™ Railing



## Post Protection

by David Balzer

Rather than pour concrete piers to support my deck framing, I prefer to embed PT support posts in the ground. Installation is quicker and easier, and I like the lateral stability that the embedded posts have. However, I have never liked the idea of exposed wood being in direct contact with the soil. To address this, I slip composite post sleeves—which are readily available and long enough to reach down to frost depth in my area—over the posts before installing them (1).

I also add galvanized steel hardware, like USP's PA44E post

anchors or Simpson Strong-Tie's AB series of standoff post bases, to the bottom of the post to lift it up off the footing and allow for drainage (2). After backfilling around the post, I finish off the top with a couple of inches of gravel so that soil doesn't come in contact with the post (3). Even though the PT posts I use are treated for ground contact, I feel better having the added protection against the elements. ❖

*David Balzer is a deck builder in Rockford, Ill.*

### Send Us Your Tips

We want your best deck-building tips. We're partnering with DeWalt to give away a power tool each issue to the reader who sends the best tip to [prodeck@hanleywood.com](mailto:prodeck@hanleywood.com). The prize for the July 2018 issue is a 60-volt cordless wormdrive saw kit. So, write up those tips. Don't sweat the grammar or the spelling—that's what editors get paid for. Take a photo (your camera's best setting, please), or send a sketch on the back of a napkin.



NOW WITH  
SUPER STICK  
TECHNOLOGY™  
EVEN ADHERES  
TO COLD, DAMP  
WOOD JOISTS!

# PROTECT YOUR DECK INVESTMENT

## PROTECTO DECK JOIST TAPE™ SEALS AROUND FASTENERS TO KEEP WATER OUT

Not all joist tapes are created equal. Some struggle to adhere, are too thick to wrap around detailed areas and can be slippery and dangerous to walk on. Protecto Deck Joist Tape was created with these problems in mind. Now manufactured with Super Stick Technology, it can be applied down to -20°F (-28°C) and in high temperatures, has an ultra-thin profile (only 22 mils) and has a slip resistant surface. Try Protecto Deck Joist Tape for yourself and see why we think it's the best joist tape on the market.

- Slip resistant surface film and UV stable
- Black color blends between deck boards
- Simple peel and stick application can be installed down to -20°F (-28°C) and high temps with no primer needed
- Compatible with pressure treated lumber
- Provides a non-corrosive barrier between treated lumber and metal hangers

(800) 759-9727 • [www.ProtectoWrap.com](http://www.ProtectoWrap.com)



Available in  
2", 4" & 9" x 50' rolls



**PROTECTO WRAP COMPANY**  
1955 South Cherokee St., Denver, CO 80223





# SUN, RAIN, TIME, LIFE: TAKE YOUR BEST SHOT

Exotic timber presence and effortless endurance. The difference  
between installing a deck and building a legacy.



[ZURI.RoyalBuildingProducts.com](http://ZURI.RoyalBuildingProducts.com) • 1.855.683.7368

For product warranty details, please visit [www.ZuriWarranty.com](http://www.ZuriWarranty.com)



**FROM OUR MILL  
DIRECT TO YOUR JOBSITE**



**WE ARE THE MILL. WE SELL DIRECT. YOU SAVE.™**

Decking • Deck Tiles • Siding • Beams • Flooring • Turning Blanks • Live-Edge Slabs • Custom-Sawn Lumber

Whether you need a board or a truckload, a bundle or a container, we can supply all your lumber needs.

**CALL NOW & SAVE!** TOLL FREE: 1-877-232-3915

**3% OFF**  
**PLUS FREE SHIPPING**

WHEN CALLING MENTION COUPON CODE: **BUILDER**

\* Special Offer Code: BUILDER (Mention it to your sales rep over the phone.) Not applicable to Deck Tiles or other sale items. Offer only valid on Hardwood Decking & Hardwood Siding. Can be combined with current offers. Expires 6/30/2018.



**ADVANTAGELUMBER.COM®**

Buffalo, NY | Grover, NC | Santa Fe Springs, CA | Sarasota, FL | Belém, Brazil

# STRONG ELEGANT EASY

Fortress AI<sup>13</sup> is an innovative, fully pre-welded aluminum railing system. Distinctly different from aluminum kits, Fortress AI<sup>13</sup> is attractive and easy to install with its simple bracket system. It also has superior performance in strength and safety, which is a unique benefit to a pre-welded system. Quality welding and premium powder coating create a virtually maintenance free system designed for use in a variety of environments.

**ALUMINUM MADE. FORTRESS EASY.**



## ALUMINUM RAILING



For design ideas, product specifications,  
and more visit: [FortressRailing.com](https://FortressRailing.com)

- Pre-welded level and stair panels with patent pending bracket system
- Distinctly different from the traditional aluminum kits
- Quick and easy installation
- 100% recyclable
- Superior performance in strength and safety
- Use with wood, composite and Fortress Aluminum posts
- Tested in accordance with ICC-ES™ AC273, NBCC, OBC, ABC, & BCBC
- Customizable with our full line of FORTRESSACCENTS LED lighting

# The best **Structural Framing Fasteners** **TIE-MASTER™**

Wood to Wood • Decks • Docks • Boardwalks • Retaining Walls • Laminated Beams  
Rim to Joist • Joist and Ledger • Underdeck Connections • Trusses



ICC EVALUATION  
SERVICE  
ESR-3531

Complies with the following codes:  
2015, 2012, 2009 International Building Code® (IBC)  
2015, 2012, 2009 International Residential Code® (IRC)



Star Drive



"The Professional's Choice™"

[www.grabberpro.com](http://www.grabberpro.com)

[www.GrabberPro.com/tie-master](http://www.GrabberPro.com/tie-master)

## The Decks of Hurricane Alley

by Bryan G. Parker



The North Carolina coast is a beautiful place to live and visit; however, during hurricane season—which runs from June until October—the area is vulnerable to storms that bring high winds and flooding. Sitting in the heart of “Hurricane Alley” is Pleasure Island, a small barrier island just south of Wilmington, N.C., that includes the towns of Carolina and Kure Beach as well as the historic Fort Fisher. Here, most homes have a deck or a porch, whether for embracing ocean and inlet views or simply providing a space to enjoy the warm ocean breezes and salt air. The trick is to build decks that not only look good and function well, but also can weather the occasional storm.

### Design

Oceanfront homes on the island are typically built with the decks facing the

ocean to maximize views of the water. These decks are usually large and encompass the entire width of the home. Often, each level of a home is equipped with a deck, which unfortunately often results in a massive stack of decks.

A way to provide outdoor space while avoiding the “stacked” effect is to incorporate decks into the floor plan of the home. Keith Bloemendaal, owner of Dutch Built Homes, in Carolina Beach, says, “With lot sizes relatively small here, design is critical when trying to maximize outdoor living space. Everyone wants outdoor space. Good design is key to ensuring that space works with the home and not against it.”

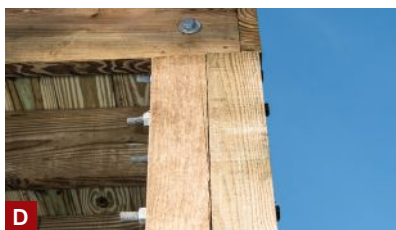
On the island, it’s common to extend the main roof structure out over the deck to provide shelter from rain and sun. This is a cost-effective way to improve traffic

**Coastal decks and porches should be designed to take advantage of the summer breezes and engineered to withstand a hurricane.**

flow between indoors and outdoors while maintaining the home’s overall curb appeal. Often these are shallow-pitched hip roofs, which have proven to be less vulnerable to damage from high winds than gable roofs. But shallow-pitched gable roofs are just as common and are sometimes a better solution for porches.

### Construction

A major difference between decks built along the coast and elsewhere is that everything on the coast starts with pilings, either marine-grade treated round timbers or 8x8 PT posts. Because most of the barrier islands off the North Carolina coast are in a floodplain, both houses and



Coastal homes on small lots often have multiple decks, resulting in a “stacked deck” effect (A). Wind-resistant low-pitched roofs are the norm in coastal North Carolina (B). To minimize the effects of waves, storm surge, and erosion, most coastal homes and decks are built on pilings (C), which can be extended with through-bolted lap joints, a common detail on elevated multi-story decks (D). Uplift connectors that tie vertical and horizontal framing members together to resist high winds are required on coastal decks (E). Decks and balconies built over living space require careful flashing and waterproofing details (F).

decks are elevated to allow storm surge and flood-borne debris to flow freely underneath them.

Along the oceanfront—or first row—the pilings are typically driven 16 feet into the ground, while the pilings for second- and back-row structures are driven a minimum of 8 feet. A machine-mounted auger is used to start the hole, and then the posts are driven into the sand with a drop hammer to the proper depth. A high-pressure mixture of water and sand is then used to compact the soil around the post.

Cross-bracing with 2x12s bolted to the posts is required for pilings that support

the main structure of a house, and it may also be required when the deck structure is integrated into the floor plan. If necessary, posts can be lap-jointed and through-bolted to accommodate multilevel decks. All of these critical connections are spelled out in prescriptive details that are widely followed by local contractors and enforced by local building inspectors.

Because salt water and salt air are highly corrosive, hot-dip galvanized (HDG) or stainless steel hardware and fasteners are required—and even those are subject to corrosion and therefore should be monitored regularly. This isn't

a requirement on Pleasure Island, but a recent series of corrosion-related deck failures on nearby Emerald Isle prompted local property-management companies to require annual inspections of rental properties under their management.

Pleasure Island is in a 140-mph wind zone. So while decks are built largely using details that most builders are familiar with, local code requires the use of a lot of hurricane clips to prevent uplift. For example, trusses or joists in a 90-mph zone would need only one clip on each side of the framing member. Here, you must either use clips on both sides of both ends of the joist or truss, or use a

# The easy way to a picture perfect deck.



## Introducing EB-TY Premium® Hidden Deck-Fastening System™

The new EB-TY Premium system comes with the ingenious EB-GUIDE predrilling tool to ensure precise and efficient fastening. The system's redesigned biscuit features a stainless-steel reinforcing plate to ensure a strong, concealed connection – showcasing the natural beauty of the deck.

Whether you're installing composite decking or exotic hardwood on your project, EB-TY Premium delivers a picture-perfect deck every time. To learn more, visit [go.strongtie.com/ebtypremium](http://go.strongtie.com/ebtypremium) or call (800) 999-5099.



Including the EB-GUIDE

**SIMPSON**

**Strong-Tie**

## EYE FOR DESIGN

wrapping-style clip that catches both sides at each end.

I don't think that code requires a specific type of clip, as long as it meets the approval of the local inspector. I have seen heavy plate straps with through-bolts, as well as longer, lighter-gauge straps that can be bent around the framing and fastened with nails. Typically, straps are used to secure the subfloor to the pilings, while plates are used to fasten girders to pilings.

Proper flashing is also very important on an oceanfront deck, to guard against wind-driven rain. While flashing methods and materials are similar to those used on the mainland, the process is monitored more closely by inspectors. They want to see how everything is flashed before it is covered up, similar to how they count nails in sheathing here. (Before housewrap goes on, an inspector makes sure your nail count is right; if the sheathing is covered up before they can look, they will make you tear off the housewrap so they can count.)

Most builders here use  $\frac{5}{4} \times 6$  or  $2 \times 6$  PT decking—or, rarely, ipe or other tropical hardwoods on high-end homes—rather than composites, mainly because the composites seem to retain so much heat. We get a lot of sun in the summer, and with this being a beach town, many people are barefoot. I've seen composites get so hot you can't walk barefoot on them, while wood decking stays relatively cool underfoot.

You see more variety when it comes to railings. Most decks

have low-maintenance composite, PVC, or metal railings, often with stainless steel cable or glass panels to maximize the views. Surprisingly, painted wood railings are also popular, keeping the painters on the island in business all year round. ❖

*Bryan Parker has been a carpenter and builder for more than 25 years in North Carolina. He has built homes, decks, and many other structures from the Appalachian mountains to the N.C. coast, and currently lives in Carolina Beach, N.C.*



**Even though they require regular maintenance, traditional painted wood deck and porch railings are still popular in coastal North Carolina communities.**



**AFCO**  
Columns and Railings

AFCO-IND.COM



STRUCTURE  
STYLE



# Wolmanized® Outdoor® Wood makes more than decks, it makes memories

Decks built with Wolmanized® Outdoor® Wood are beautiful, strong and protected against termites, rot and decay.

When you build with Wolmanized® Outdoor® Wood, you know you're creating memories that will last.

**Lonza**



[WolmanizedWood.com](http://WolmanizedWood.com)

# FAIRWAY

ARCHITECTURAL RAILING SOLUTIONS



Smart Design, Breathtaking Views.  
We Do Railing. PERIOD.

Cellular PVC • Steel • Aluminum • Vinyl • Composite

FairwayRailing.com



Shown: A210 Aluminum with Horizontal Cable Infill  
© 2018 FAIRWAY ARCHITECTURAL RAILING SOLUTIONS

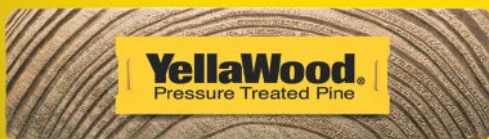
# EVERY DECK

CAN BE A

# REFERRAL



IF IT DOESN'T HAVE THIS **YELLA TAG**, YOU DON'T WANT IT.



Make sure everything you build also builds your reputation. Use YellaWood® brand pressure treated pine and turn your next project into a referral. As the most recognized brand of pressure treated wood, consumers know and trust our products. That's why homeowners seek out contractors who use the YellaWood® brand. **Find a dealer at [YellaWood.com/FindUs](http://YellaWood.com/FindUs)**

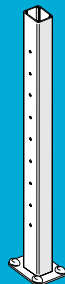
YellaWood® brand pressure treated products are treated with preservatives (the "Preservatives") and preservative methods, systems, and technologies of unrelated third parties. For details regarding the Preservatives, methods, systems, and technologies used by Great Southern Wood Preserving, Incorporated, see [www.yellawood.com/preservative](http://www.yellawood.com/preservative) or write us at P.O. Box 610, Abbeville, AL 36310. Ask dealer for warranty details. For warranty or for important handling and other information concerning our products including the appropriate Safety Data Sheet (SDS), please visit us at [www.yellawood.com/warranties](http://www.yellawood.com/warranties) or write us at P.O. Box 610, Abbeville, AL 36310. YellaWood® and the yellow tag are federally registered trademarks of Great Southern Wood Preserving, Incorporated.



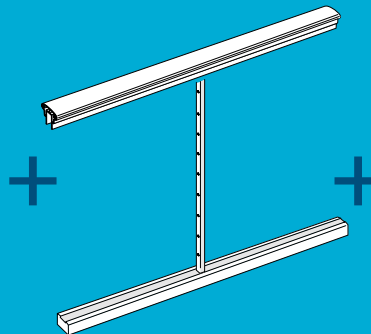
# Aluminum Railing with CableRail ...Beautiful and Easy

Feeney's new DesignRail® Aluminum Railing Kits with stainless steel CableRail infill make it easier than ever to create professional quality railings outdoors or in. This pre-packaged, component-based kit system simplifies railing projects with easy to find and install parts that are available at Feeney dealers...helping your project stay on time and on budget.

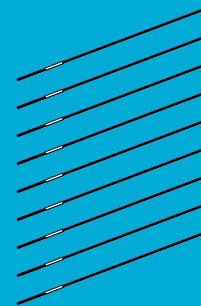
- Highest quality products made from 6000-series aluminum with a durable AAMA-2604 powder coated finish
- Pre-packaged kits for posts, rails, and accessories offer easy, just-in-time purchasing
- Specially designed for use with CableRail Kits
- Fast and Easy Installation



POST KITS



LEVEL & STAIR  
RAIL KITS



CABLERAIL  
KITS

For more information call 1-800-888-2418  
or visit [www.feeney7.com](http://www.feeney7.com)

feeney®

## Managing Your Business Reputation

by Bobby Parks

It took me years to build the brand and reputation of my Atlanta-based decking company, Peachtree Decks & Porches, but the effort made a big difference when I sold the company. That was before the explosive growth of social media, which has made it faster and easier to create a business reputation, but trickier to maintain and protect it. Because a good reputation gives your company a better chance to be successful, while a bad one could spell the beginning of the end of your company, brand reputation management needs to be taken seriously.

Like it or not, a high percentage of customers do their due diligence online. They're not only searching for contractors in their area but also trying to determine which ones are reputable and trustworthy and to what degree past customers are happy or unhappy. In large part, this determination is made by reading customer reviews.

### References vs. Reviews

As recently as 10 years ago, potential customers would ask for references after the initial sales call. Now, thanks to online reviews and posted surveys, prospects can get the equivalent information before you ever meet with them, giving you much less control over what customers can read about your company.

It's estimated that 85% to 90% of consumers read and are influenced by online reviews, while only a small percentage post them. Even so, I've met plenty of contractors who not only don't have any reviews, but also consider themselves too busy to worry about it. But here's the problem: At some point, you or your company will cross paths with a customer who dings you with a bad review. So if

99% of your past customers are satisfied with your work, but your only review is a negative one and you have no "Stars" lit up, you're going to look toxic. How many potential customers do you think will contact you at that point?

### Timing Is Important

When I ran my former company, protecting my business reputation started with a commitment to leaving everyone satisfied. Once a project was completed, we mailed our company's warranty to our client, along with a simple survey, a review request form, and a self-addressed, postage-paid envelope. Today, of course, this can be done as one email document with all three forms included in one PDF.

Our survey included five or six brief statements and asked the customers to rate us on a 1-to-5 scale. At the end of the survey, we had a section for comments, which we often transferred to the "Customer Reviews" section of our website. A quicker option now might be to ask a customer to send you a review via a text message, which could then be copied to your website. This won't help with online reviews, but it will have a positive impact on your website.

On our review request form, we explained why the review was important to us and included a link with directions to the site. In our market, the most popular review site is Kudzu.com, but in your market, other sites—including Angie's List—might be more applicable. It's not necessary to ask for multiple site reviews, but it's a good idea to vary your requests to build up a foundation on each site.

In addition to this packet, I also made it a point to follow up with a personal

email thanking clients for the opportunity to work with them. In my email, I included before and after photos of the project to remind them of the changes we created and hopefully inspire them to post a review.

It's when the project has just been completed that clients are likely to be as happy as they're ever going to be (outside the fact that this is when they have to write the last check for your services). Everything's new, they haven't even had to clean it yet, and all the lights still work. So now is the perfect time to press for the review, before the happiness fades.

### Protect Yourself

Building a foundation of good reviews creates insurance against the day when an unreasonable customer posts a bad review. Surrounded by good reviews, it won't have the same impact as it would if it were the *only* review. Your 5-star rating may drop to 4.5 or 4.75, but it won't sink your ship.

Most potential prospects understand that no one's perfect, and when they see 20 good reviews and just one bad one, you'll get the benefit of the doubt. Even better, follow up and address the bad review in an unemotional and professional manner, which will likely negate the bad review altogether. What's important is that prospects see that an issue has been addressed. Most can read between the lines. Look at it this way: It's either 20-1 in your favor, or 1-0 against you.

### Reviews Influence Spending

Another interesting statistic (I've learned much of this information through my participation in Remodelers Advantage) is that nearly one third of consumers will

## DECK LEDGER

spend 31% more on a contractor with solid positive reviews. I can't prove this, but it makes sense. In my market, though I was almost always the highest-priced option, I think it helped rather than hurt my business, because my company was perceived to be the lowest-risk option.

A consumer is making a substantial investment when choosing a deck

builder, and who they select to do the work reflects on their appetite for risk. They've heard contractor horror stories, and there have always been sub-par contractors out there, creating uncertainty about what a consumer's experience will be and how a job will be delivered. So, faced with spending a substantial amount of money anyway, many risk-

averse customers will decide to spend a little more on an established contractor with a history of satisfied customers and strong reviews.

### Ask for the Review

I know from experience that it can be challenging to get even the most satisfied customers to go through the hassle of going online, creating an ID and password, and posting a review. And unfortunately, unhappy people just seem to be more motivated to do this than satisfied ones. So, how do you convince those happy customers to let others know how awesome you are?

A lot comes down to your relationship and communication with your customer, which should occur throughout the project, not just at the start or when you want a progress payment. Make sure they understand that you are committed to making them happy, and that you are going to ask them to take the time to help you by doing a review. Acknowledge that it may take 10 to 15 minutes to set up an ID and password, but leverage your established relationship and ask a second and third time if that's what it takes.

I've read that customer reviews impact how Google ranks you in searches. Maybe this is due to the "fresh content" factor, but whatever the reason, it's good motivation for securing those reviews from your clients.

Think about it this way: If you're out of town and Googling for a restaurant "near me" and some have reviews with four or five stars and good comments and others have no stars and negative comments, where are you going to eat dinner? If survey results for something as inexpensive as a meal are a factor in your decision, it certainly makes sense that survey results are going to be a factor in a \$20,000+ deck or remodeling investment. ❖

*Bobby Parks owns BP Consulting and Design LLC and is a contributing editor for Professional Deck Builder.*

**SplitStop™**  
HIGH-PERFORMANCE DECK SCREWS

**T3 COMPOSITE SCREWS**

**Designed to Eliminate  
Mushrooming, Burrs &  
Distortion**

**You've Finally Got the Deck Stacked in Your Favor!**

Grey Finish  
Cedar Finish  
Redwood Finish  
Hickory Finish  
Dark Brown Finish

**SplitStop Results**  
PVC  
**Competitor Results**

**SplitStop Results**  
WPC  
**Competitor Results**

**TITAN**

Call 888-578-3273 or visit our website: [SplitStop.com](http://SplitStop.com) for more information & free samples.

# POWERBOND™

## Protection to Safeguard your Customer's Wooden Deck Structure



# DECK WRAP™ POWERBOND™

INSTALLS ON LEDGER BOARDS • JOIST TOPS • JOIST ENDS • POSTS

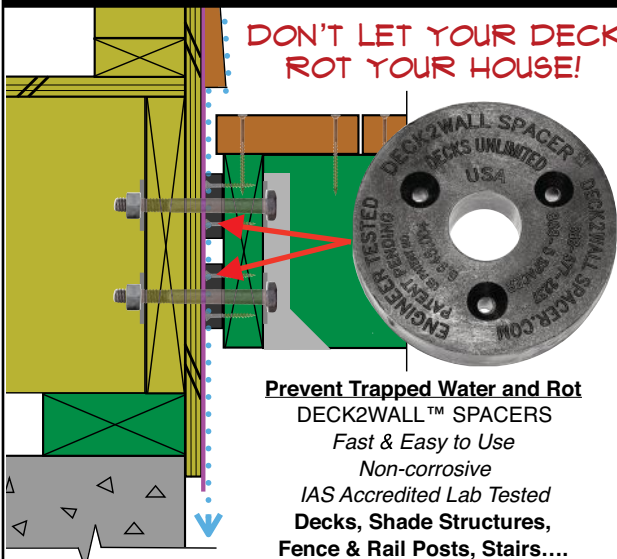
Stocking **DeckWrap™ PowerBond™** gives you additional sales opportunities when selling decking materials. This self-adhering waterproofing membrane is suitable for use with treated, untreated and synthetic woods. **Start realizing new sales today by calling 800-882-7663.**



[mfmbp.com](http://mfmbp.com)

# DECK2WALL™ spacer

**DON'T LET YOUR DECK ROT YOUR HOUSE!**



**Prevent Trapped Water and Rot**  
DECK2WALL™ SPACERS  
*Fast & Easy to Use*  
*Non-corrosive*  
*IAS Accredited Lab Tested*  
**Decks, Shade Structures,  
Fence & Rail Posts, Stairs....**

Deck2wall, Inc.  
888 577-2237  
[www.deck2wall.com](http://www.deck2wall.com)  
US Patents  
6945004 & 8087207

Find at participating  
Lumber Yards  
Home Centers

Available at



**MODERN & CONTEMPORARY  
ALUMINUM**

**RAILING • FENCING • POSTS & COLUMNS**

Learn More at [KeyLinkOnline.com](http://KeyLinkOnline.com)



Cable Railing Specialist



NOVA II



Spectrum Railing System



SUNRAIL



RAILEASY™

For Any Budget.

For Any Setting.

For Any View.

For Everyone.

Available Nationally Through Our Network of Dealers

1.800.541.6829 | info@atlantisrail.com | www.atlantisrail.com



LONG LIVE YOUR DECK

IT'S TIME.  
GET OUTSIDE.

More info and warranty details at [WestechBP.com](http://WestechBP.com) or call 866-423-2385



# DeckWise.com

MANUFACTURERS OF HIDDEN DECK FASTENERS AND ACCESSORIES

AMERICAN COMPANY  
AMERICAN TRADITION  
AMERICAN PRIDE™

# Ipe Clip®

Hidden Deck Fasteners



**EXTREME®**  
Gap Spacing 3/32"



**EXTREME4®**  
Gap Spacing 5/32"



**EXTREMEKD®**  
Gap Spacing 1/4"

# Ipe Oil®

Hardwood Deck Finish



# WISECOAT

Hardwood Deck, Siding & Fence Sealer

NEW!



ZERO  
VOC!

# WiseRail®

Stainless Steel Deck Cable Rail Kits



IPE OIL® • WISECOAT™ • IPE SEAL® • WISERAIL™ CABLE RAILING • HARDWOOD WRENCH™  
DECKING SCREWS • ALTITUDES PEDESTAL® • HIDDEN SIDING FASTENERS • WISEWRAP™ DECK FLASHING TAPE  
HARDWOOD DECK TILES & CONNECTORS • BOARD SPACERS • HARDWOOD CLEANER & BRIGHTENER • DECKING TOOLS & ACCESSORIES

Tel: (866)427-2547

www.DeckWise.com

info@deckwise.com

## Do You Buy Hidden Deck Fasteners or Construction Lags? We Guarantee the Best Quality and The Best Price! Call or email us for details!

### Construction Lag Screws

Corrosion-Resistant  
Round Washer  
Head Screws

#### Star Drive Recess

- Twice the torque of Phillips & square drives
- Reduces camout and end load
- Gives better bit life
- Reduces spinning & fastener damage



Sure Drive USA

www.suredrive.com

## “CTX”

NEW  
PRODUCT!

### Construction Lag Screws

Built-On Round Washer Head

- Smooth edges give a neat, finished appearance



	#14	#15	#17
Thread diameter:	.25	.265	.310
Head diameter:	.54	5/8"	11/16"
Shank diameter:	.167	.205	.226
Recess size:	T-25	T-30	T-40

## Deck Building SOLUTIONS

The answers for a long lasting,  
more beautiful deck.



### HIDDEN FASTENERS



Call for your  
free sample!  
**1-800-951-2222**



## RAILING ON A WHOLE NEW LEVEL

### GET THIS LOOK

Vault Dusk decking with SLX InvisRail™ railing and ALX Contemporary stair railing with rectangle profile in Brushed Titanium and ALX Contemporary solar post caps in Brushed Titanium

**Dec**x**orators**®  
Go Beyond Ordinary

[Decorators.com/ALX](https://www.Decorators.com/ALX)



# Building a Stone Deck

## Standard deck framing and lightweight plastic grating support travertine pavers

by Bruce Stenman

When it came time to renovate my home's aging wood deck, I wanted to replace it with an extensive single-level exterior living space that would require a lot less maintenance. Complicating matters, my California home was located on a small site with a steep slope and changes in elevation from both east to west and north to south.

To fit the complex project into a tight space, I used a hybrid approach that combined the design flexibility of free-standing deck framing with a durable, maintenance-free stone paver surface supported by Silca System plastic grating. The project also involved considerable concrete and masonry work that performs both a structural function and an aesthetic one.

I'm a homeowner, not a professional deck builder. But I have a background in commercial construction, and I acted as the general contractor on this project. I was on site every day, specified and purchased the materials, and provided the construction details to the deck contractor—who had little experience with three-dimensional concrete construction—and the concrete contractor—who lacked experience and knowledge regarding wood framing.

### Concrete Work

To ensure that all the pieces would fit together perfectly, I used Home Designer Pro 3D architectural software from Chief Architect to flesh out the design and provide accurate working plans for

the concrete contractor. In particular, the project relied on the positioning and structural integrity of three large planters that had an average depth of 8 feet (**Figure 1**).

Because the planters needed to function as retaining walls as well as support the many cubic yards of dirt that they would contain, I had my plans reviewed by a structural engineer. After demolishing the existing deck and doing a fair amount of site work, we formed and poured footings for a combination retaining wall and slab and curb along the stone garden wall, and for the stairs leading to the hot-tub area. We also formed and poured the deck footings, all to the engineer's specifications.

Forming and pouring the stairs and

## Building a Stone Deck

landings was precise work. Here, the CAD plans were critical, as was the tripod-mounted laser that I used to ensure that all of the elevations were correct within 1/4 inch, especially for the 17 steps from the entry area down to the driveway. It's quite different to be doing this with concrete forms—where there are no do-overs—rather than building stairs using wood.

We built the planter walls using masonry block that we then coated inside and outside with Quikrete Quik-wall surfacing bonding cement. SBCs are used to build dry-stack (without mortar) block walls while providing a stucco-like waterproof surface. To strengthen the walls, we placed rebar vertically and horizontally inside the blocks, and then filled the cores of the blocks with concrete (**Figure 2**).

### A Freestanding Deck

The planters, front and rear poured concrete steps, and the retaining wall act together to lock the deck framing into place, eliminating the possibility of lateral movement. Consequently, the framing only needed to support the static load of the deck surface material and the live load of people on it. And because the structure of the house precluded a strong ledger connection, most of the deck framing is freestanding.

We framed it using 6x6 posts and double 2x10 beams to support 2x10 deck joists, all of which were ground-contact-rated PT lumber. To meet local seismic requirements, we connected the joists to the beams with Simpson Strong-Tie HD2A holdown connectors. And because of my experience in the 1989 Loma Prieta earthquake, which badly damaged the house that I owned at the time, we reinforced the framing against lateral movement with plenty of 2x6 and 4x6 cross-bracing, even though code in my area doesn't specifically require it. We also used plenty of blocking between the joists to stabilize them.



**Figure 1.** The existing deck had multiple problems, including a narrow staircase, poor illumination, multiple levels, and a non-code-compliant guardrail that blocked the view (photo, top). The author used a CAD program to flesh out the new design and provide accurate working plans for the concrete contractor (drawing, above).

Because I had specified PT lumber rated for ground contact, I also specified hot-dip galvanized hardware, including joist hangers, hurricane clips, bolts, washers, nuts, lag screws, and through bolts. Since neither Home Depot nor my local building supply stores seemed to stock HDG hardware, I had to order most of it online (**Figure 3**).

### Installing the Stone

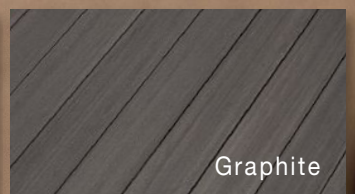
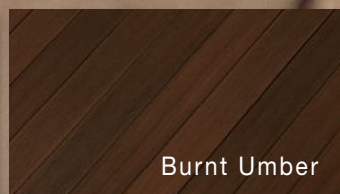
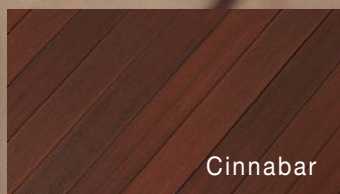
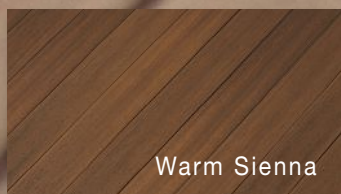
Though I initially considered ipe decking, I decided on stone because it would require less maintenance (just an annual pressure-washing). I chose 30mm-thick (about 1 1/4 inches) travertine stone pavers for the deck surface, and plastic grates from Silca Systems to support the pavers. In my research, I came across several



# FOR WOOD LOOKS THAT LAST, DON'T RELY ON WOOD.

GIVE YOUR CLIENTS NATURAL WOOD BEAUTY WITHOUT THE WORK

Fiberon Symmetry® composite decking has a rich color palette and premium matte finish. Four-sided PermaTech® cap layer for unbeatable stain and fade protection. And durable composite construction and 25-year warranties. Plus, contractors can enjoy an exclusive five-year labor warranty and product rewards through the Fiberon Partner Program.



Discover the Fiberon difference at [fiberondecking.com](http://fiberondecking.com)



## Building a Stone Deck

**Figure 2.** Considerable site work was required to improve drainage prior to pouring the new deck footings, the retaining walls, and the slab that would support the planters and staircase (right). The masonry block planter walls were coated with surface bonding cement (SBC), reinforced with rebar, then filled with concrete (far right).



**Figure 3.** Standard deck framing was used to support Silca Systems grating and stone pavers. Note the SST HD2A holddown connectors and the robust cross-bracing, a precaution against seismic activity (far left). Silca Systems plastic grates are light and easy to cut, and they attach to the deck framing with four screws, one in each corner (left).

grating systems, but Silca's compact, 18 $\frac{1}{4}$ -inch-by-16-inch-by-1 $\frac{1}{2}$ -inch sections are lighter and easier to handle than some of the other systems are.

The grates are sized to fit over joists with standard 16-inch-on-center spacing, and according to the manufacturer, are capable of bearing the weight of pavers up to 3 inches thick. Each 4-pound grate covers about 2 square feet and fastens to the framing with four screws, one at each corner.

The cost for the grates was about \$5.95 per square foot delivered to my door; I needed enough to cover approximately 1,000 square feet. I paid about \$6 per square foot for the travertine pavers, so

the total material cost for the pavers and grating was roughly equal to the cost of ipe, which would have been about \$13 per square foot in my area.

To make sure that deck framing is capable of carrying the added weight of stone pavers, Silca offers technical support, including engineered details (signed off by a structural engineer), framing requirements, post spacing, and footing dimensions. For pavers that are 1 $\frac{1}{4}$  inches thick, for example, Silca recommends a maximum joist span of 12 feet 10 inches for 2x10 SYP PT framing 16 inches on-center, compared with a 14-foot (maximum) span for conventional wood or composite decking.

There was nothing tricky about installing the Silca System; the framing is standard-issue deck construction, and the grating is easily cut with a saw when necessary and is quickly fastened to the framing with a screw gun.

Before installing the stone tiles or pavers, landscape cloth can be laid over the grating to allow the joints to be filled with polymeric sand or grout. But I chose to leave the gaps open to avoid maintenance problems with grass growing in the sand, to allow water to drain off the deck, and to maintain airflow around the deck framing below. I used construction adhesive to bond the pavers to the Silca grating.

# OUTDOOR LED LIGHTING

## INTRODUCING THE GENERATION II LIGHTING CONTROL HUB

PLACID

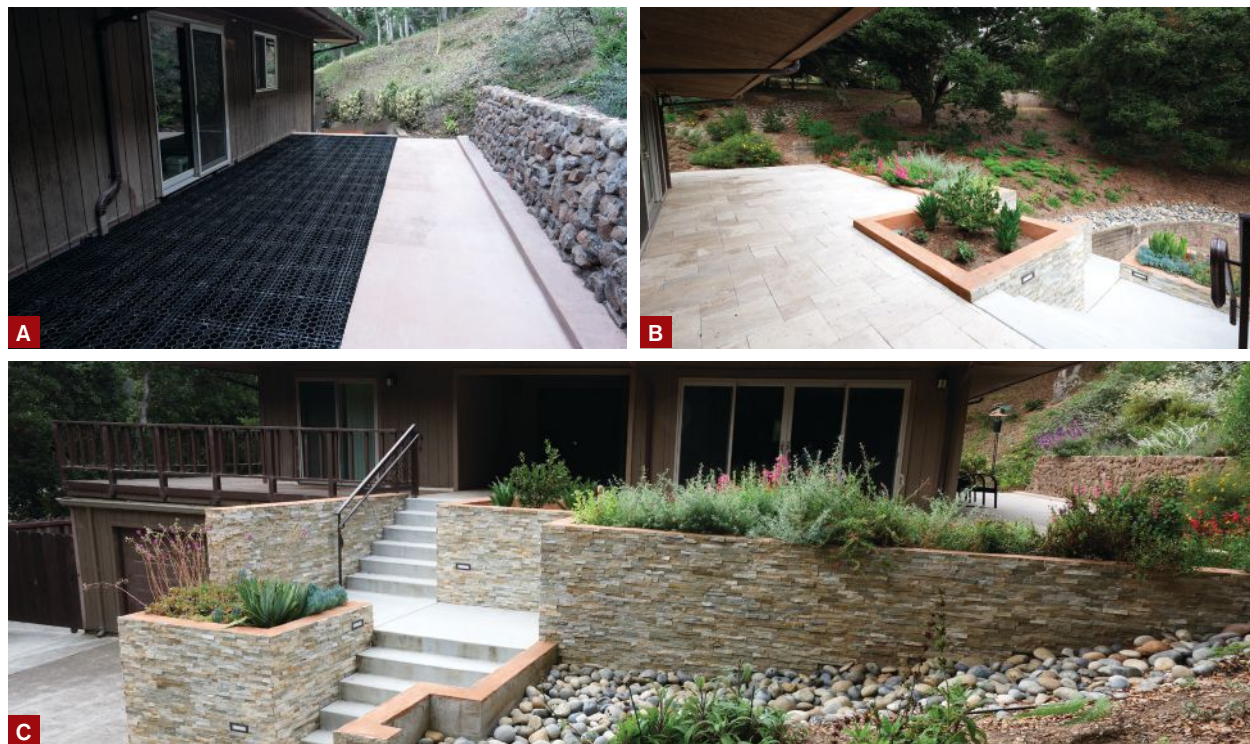
POINT  
LIGHTING

**FEATURE  
PACKED!**



Learn More at [PlacidPointLighting.com](http://PlacidPointLighting.com)

## Building a Stone Deck



**Figure 4.** Prior to installing the 1 $\frac{1}{4}$ -inch-thick travertine stone pavers, the author applied an isolation membrane to the slab. The pavers over the slab were set in thinset mortar, and the rest were simply glued to the grating with construction adhesive (A). The pavers were set in a Versailles pattern, which is commonly used for indoor tile installations (B). The new deck features wider stairs and landings for easier access, more outdoor living area, and improved drainage on the sloped site (C).

Along the side of the house, the paver surface extends out over a concrete slab, which is part of the retaining wall. Here I bolted a ledger to the concrete curb supporting the slab edge and hung the joists from the ledger so that the top surface of the Silca grating panels rested  $\frac{1}{8}$  inch above the adjoining concrete slab. This allowed for a layer of thinset mortar between the stone and the slab (Figure 4).

Before installing the pavers, I coated the slab with Merkrete Fracture Guard 7000, a liquid-applied crack-isolation membrane. Once the membrane cured, I set the pavers in Mapei Ultra Flex polymer-modified thinset.

This approach makes the top surface of the paver deck look seamless, even though a third of it rests on a concrete slab and two-thirds of the pavers are supported by joists that are from 20 to 40 inches above ground level. One benefit of this

approach is that airflow under the house and through the wall vents is maintained without the use of metal ducts and powered fans.

### Finishing Touches

When I built the planters, I installed individual water supply pipes for irrigating each one, along with PVC drain lines that feed into the French drain lines. Then I half-filled them with rock for drainage, installed a layer of landscape fabric, and filled them the rest of the way with soil.

At the same time, I added wiring for the 8-Watt LED fixtures for the steps. Instead of placing smaller lights in the risers, I attached the fixtures to the concrete block walls, which we dressed up with 12-inch-by-24-inch stone veneer panels. The lighting from a single fixture is adequate to illuminate an entire flight of steps, so instead of 45 riser lights, only

five lights were required to light all 15 of the 60-inch-wide stair treads. In addition to being less expensive and easier to maintain, the wall-mounted lights provide better illumination of the steps with a more attractive effect.

Now when I look from my house out over the deck, I can see flowering plants that add color and soften up the view, instead of a railing. That's because the planters are at deck level and at least 36 inches deep, which eliminates the need for a railing here. And I can relax, knowing that I've greatly reduced the cost and need for annual maintenance. ❖

*Bruce Stenman has a background in commercial construction and has worked as a special projects manager involved in building and remodeling hundreds of 7-Eleven stores. He is also founder of Hole Pro, a company that designs and sells specialized hole cutters for the building trades.*



[WWW.WILDHOGRAILING.COM](http://WWW.WILDHOGRAILING.COM)

**100% MADE IN THE USA**



**WILD HOG IS THE ONLY PRODUCT THAT PUTS THE FOCUS BACK ON YOUR VIEW AND NOT YOUR RAIL**

### WILD HOG RAILING

- 🐾 6 Gauge - 4" x 4" Welded
- 🐾 Available in Powder Coated Black & Silver
- 🐾 Zinc Epoxy Pre-Coat
- 🐾 Available sizes: 3' x 6' & 3' x 8' & 5' x 6'
- 🐾 Refined with your view in mind



### TAHOE HOG RAILING

- 🐾 .375 Gauge
- 🐾 Woven not Welded
- 🐾 Available sizes: 3' x 6' & 3' x 8' & 5' x 6'
- 🐾 Raw Steel and Black Powder Coat
- 🐾 Great for Commercial Projects

### HOG TRACKS

- 🐾 6' and 8' Aluminum Channel
- 🐾 Customize your Wild Hog Project
- 🐾 Sleek look for Railing, Fencing, Arbors, whatever you can dream up
- 🐾 Available in Black and White Powder Coat



### INTRODUCING THE FREEDOM FILL

- 🐾 Now compatible with Trex Transcend Rail
- 🐾 Aluminum Infill Kit
- 🐾 Available in Black and White Powder Coat
- 🐾 Available in 8' Kit & 6' Kit
- 🐾 Set Your View Free

[WWW.WILDHOGRAILING.COM](http://WWW.WILDHOGRAILING.COM)

# A GREAT DECK STARTS FROM THE GROUND UP.



MicroPro pressure treated wood products are produced by independently owned and operated wood treating facilities. MicroPro pressure treated wood products are treated with Micronized Copper Azole. MicroPro is a registered trademark of Koppers Performance Chemicals Inc. ©4/2018



[kopperspc.com](http://kopperspc.com)



# Building Bracketed Deck Stairs

**Build wider, stronger deck stairs using just a pair of solid stringers and metal brackets**

by Mike Guertin

I don't see many deck stairways built with bracketed stringers, but they're a good alternative to notched stairs in certain situations. The design is similar to housed stringers—where dadoes are routed into the framing to provide shoulders for the treads and riser boards to rest in—but is simpler to build. And bracketed stairs are stronger than stairs with notched stringers because the 2x12 stringers aren't weakened by notches that effectively leave only 2x6s to support the loads on the stairs.

I like to use solid stringers and brackets whenever a design calls for wide stairs or long spans. Notched stair stringers have a limited unsupported run of 6 feet, according to the AWC's DCA6 (*Prescriptive Residential*

*Wood Deck Construction Guide*). Compare that with solid stringers, which can span more than twice that distance—13 feet 3 inches—without intermediate supports.

DCA6 also limits the width of 2-by treads between solid stringers to 36 inches, but that can be increased substantially by installing structural risers. Incidentally, this also satisfies the building code requirement to block openings that are greater than 4 inches—including underneath the treads—when the stair is more than 30 inches above grade.

## **Metal Brackets**

On this project, the stairs access a landing for a storage building. I built them

using ordinary pressure-treated lumber rated for ground contact (AWPA UC4A). For a more finished look, the stringers, treads, and risers could be made from any finish-grade, naturally decay-resistant lumber, such as cedar or a suitable tropical hardwood.

The treads are 2x12s that I ripped down to 11 ¼ inches. Because the risers are structural to help support the 4-foot span of the treads, I used 2x10s for them.

DCA6 provides a tread-support detail that features 2x4 PT cleats fastened to the solid stringers, but on this project, I used metal stair angles. While stair angles look like ordinary angle brackets, they are made of thicker-gauge steel and are stronger. Stair angles are made

# Building Bracketed Stairs

by both Simpson Strong-Tie (TA9Z and TA10Z) and MiTek/USP (SCA9-TZ and SCA10-TZ) and are weight-rated depending on how many structural screws or lag screws are used to mount them to the stringers.

Another option is to use EZ Stairs (ez-stairs.com) metal support brackets, which have a right-angle design that supports both the treads and the risers. According to the manufacturer, this system can be used with a single pair of stringers to build exterior deck stairs that are as wide as 7 feet.

## Stringer Layout

To avoid overloading an end joist or a rim joist, I prefer to support the head of the stair independently of the deck frame. On this project, I began by fastening a 2x6 dropped header to the 4x4 posts with structural screws. The 2x6 is also supported by a pair of 2x4 jack studs that are screwed to the posts and bear on the footings supporting the posts. The 2x6 is in plane with and provides additional support to the end joist of the deck (**Figure 1**).

Stair layout starts as it does for cut stringers. First, I determine the rise—the height from the top of the finish deck to the point on the landing where the bottom step will fall. Then I find the run—the distance from that point back to the deck. Of course, these two measurements are necessary for calculating the width of the treads and the height of the risers.

When laying out the treads and risers, I mark the tops of the finish treads, rather than the bottom, or cut line. Screwing a 1-by strip of wood to my framing square instead of using stair gauges or lining up the framing square by eye allows me to mark the tread and riser heights with more accuracy (**Figure 2**).

I draw heavy pencil lines for the treads and light lines for the risers. This is because the marks aren't cut out, as they would be for notched stringers, and



**Figure 1.** A dropped 2x6 header fastened to support posts provides a solid attachment point for the stairs (above left). Rise and run—and therefore the size of the risers and treads—is determined by marking a level line from the top of the decking, and then measuring out from the front edge of the decking and up from the end point of the stairs on the landing (above right).



**Figure 2.** For laying out treads and risers on a pattern stringer, a 1-by straightedge screwed to a framing square provides more accuracy than stair gauges (A). To locate the metal stair brackets, mark both the tops and bottoms of the treads (B). Tilt the two stringers on edge to transfer the tread-riser intersection to the other stringer (C), then lay out the remaining stringer so that it is a mirror image of the pattern (D).



# It's a SNAP!

**Double the decks. Double your money.**

**Cutting deck installation time in half is a snap with Step-Clip™!**

The Step-Clip™ system is easy and fast to install, so you can double your deck installations — and double your money. Our clips install easily with a roofing nail gun or hammer. This means less kneeling or bending up and down for you, not to mention no need for spacing or grabbing for fasteners.

Decking installation is a snap — with the Step-Clip system!

Patent Pending

[duralifedecking.com](http://duralifedecking.com)



Durable Decking & Railing Systems

It's Your Choice. We Just Make It Easier.

**Do it once. Do it right. Do it DuraLife.**

# Building Bracketed Stairs

the actual position of the risers will be  $\frac{3}{4}$  inch behind the stringer nose. This makes it easier to erase the light riser lines later.

After the primary stringer layout, I make a second pass to scribe the bottom lines for the treads using the  $1\frac{1}{2}$ -inch tongue of the framing square. This lower line is where the top of the tread brackets will be aligned.

To transfer the layout onto the mating stringer, I square a line where each of the riser and tread marks meet along the top edge of the pattern stringer. Then I align the pattern stringer with its mate flush across the top edge and transfer the edge marks to the mate.

With the two stringers positioned so that they mirror one another, I use the framing square to mark the mate with the light riser line and the top-of-tread and bottom-of-tread lines. This ensures that the same face isn't marked on both stringers.

The top stringer cut is one straight line with the top ear clipped for the decking to pass over. At the bottom, I cut both the heel line and the riser line, but the riser-line cut is optional. The stringer can be left to run out onto the landing, but it looks better when it terminates with the nose of the tread.

## Installing the Brackets

It's easier and faster to install the hardware when the stringers are resting across a pair of sawhorses, but hardware can also be screwed in place when the stringers are in position. In either case, orienting the bracket along the line at the bottom of the tread is important, and don't place it too far forward or the bracket will interfere with the riser installation (**Figure 3**).

On these stairs, I wanted the tip of the tread nosing to line up with the top of the stringer. I positioned a section of 2x12 at the tread line and measured back  $2\frac{1}{4}$  inches along the bottom from the face of the tread:  $\frac{3}{4}$  inch for the tread



**Figure 3.** When installing the metal brackets, be sure to provide clearance for the structural riser (A). Before installing the treads, drill pilot holes for the structural screws that will be driven through the stringers and into the treads and risers (B). Structural screws are used to fasten the treads to the brackets (C).



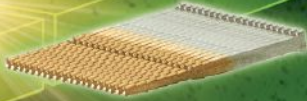
**Figure 4.** Five-inch-long structural screws driven through the risers into the back edge of the treads 12-inches on-center reinforce the treads (above left). The front edge of the treads and the top edges of the risers are also fastened together with long structural screws (above right).

"FINALLY HI-TECH FOR DECKS"

- EASIEST
- FASTEST
- HIDDEN
- STRONG
- DURABLE



Patent pending fasteners are collated for easy handling and quick loading. Available in 304 stainless steel or more economical EDGEcoat steel.



Install Decking 5 Times Faster Than Conventional Fastener Methods!!



Hidden Fastener Decking System

For more information and where to purchase go to [www.hidfast.com](http://www.hidfast.com)

# Invis-A-Rail™

The World's Easiest Transparent Railing In-fill System

10% discount till June 30 with code: PDB518

1 cut support channel

2 hook n'-drop

3 insert damper

4 fasten to your rail

Same Two Parts Does Level & Stairs



revolutionary

new transparent railing in-fill system

For more information and easy ordering go to [www.Invis-A-Rail.com](http://www.Invis-A-Rail.com)

© 3G Industries, LLC All rights reserved. Patent #7,478,799

## Building Bracketed Stairs



**Figure 5.** Flat-head structural screws driven through pilot holes in the stringers and into the treads and risers draw the assembly together (A). After the author slides the stairs over into position, he uses stair-stringer connectors to hang the stairs from the rim board and 2-by header (B). ThruLok screws and a hefty blocking detail fasten the guard post to the stringer and the structural riser (C). The final tread is notched to fit around the post, then fastened in place with structural screws (D).

nose overhang (code requires a minimum projection of  $\frac{3}{4}$  inch and a maximum projection of  $1\frac{1}{4}$  inches) and  $1\frac{1}{2}$  inches for the 2x10 riser thickness.

After screwing the brackets to the stringers, I drilled pilot holes for structural screws to be driven through the outside of the stringers and into the end of the treads. Then I installed the treads, driving  $1\frac{1}{4}$ -inch-long structural screws up through the metal brackets into the treads.

The risers perform a structural function, turning the treads into small beams. So I used structural screws driven about a foot apart through the back of the risers and into the back of the treads to beef up the assembly. I also drove structural screws down through the front of the treads into the structural risers at 12 inches on-center (Figure 4).

Even though the tread brackets are screwed to the inside face of the string-

ers, driving 5-inch long structural screws through the outside face of the stringers and into the treads and risers really tightens up the stair assembly. Here, the stairs run next to a wall, so I had assembled the staircase about a foot and a half or so away from its final position, far enough to be able to drive the screws through the outside face of the wall-side stringer. Then I slid the stairs over into place and fastened them to the header with metal hangers (Figure 5).

This technique leaves a lot of screw heads exposed, which was not a problem on a set of utility stairs like this. I used black HeadLok flat-head structural screws, which probably stand out more than would Simpson Strong-Tie's SDWS screws, which have tan heads. Another option might be to trim the stringers with separate skirtboards that conceal the fasteners (though this would present other trimming challenges).

### Post Assembly

Bracketed stringers are taller and provide more attachment surface than cut stringers, so they tend to be more stable front to back. To keep the lower guard post from moving side to side, I used a FastenMaster-designed ThruLok block-and-screw system. For that detail, the 4x4 post and blocking (which is cut to the height of the riser board) are both ThruLok'd to the structural riser. Longer ThruLok screws are then driven through the stringer, the post, and the block.

Finally, after notching the bottom tread around the 4x4 post, I screwed it into place like the other treads, and finished up the railing. ❖

*Mike Guertin is a builder and remodeler in East Greenwich, R.I., and frequent presenter at JLC Live and DeckExpo. You can follow him on Instagram @mike\_guertin.*

**The Deck Barn**

# TheDeckBarn.com

## Aluminum Balusters

Round 26" \$1.35 ea.

Round 32" \$1.75 ea.

Round 34"-36" \$2.55 ea.

Round 42"-48" \$3.75 ea.

Bronze, Wicker, White, Black in semi-gloss or matte

**Over 3,000,000 Sold**

## VEKA PVC Railing ProZ

With Aluminum Balusters

Commercial Grade — 800 lb. rated

6' Kit \$110. 8' Kit \$147.

Vinyl and Aluminum 4 colors ea. — Mix & Match

# DECK DOCK

### MINERAL-ADDED HDPE PLASTIC DECK BOARDS

- Rich, Bold Colors
- Dependable Performance
- Completely Waterproof
- No Noticeable Fading
- Mold & Mildew Free
- Limited Lifetime Warranty
- Slip Resistant
- Low Maintenance

[www.lumberock.com](http://www.lumberock.com)

800-480-2327



PREMIUM DECKING



**AVAILABLE EVERYWHERE  
CALL FOR DETAILS**

# DAY'S END

Focus on good design and clever construction



## Pool Privacy

by Lawrence Winterburn

In a large yard with a backdrop of trees, the head of a pool should have a focal point. Drawing the eye across an expanse of water to the far end of the pool creates reflections, while adding a mirror to the focal point creates an illusion of depth. Is adding trompe l'oeil to the equation too much? Well, since I had already stepped over that line with this design, I decided to add some contrasting trelliswork—some made out of red cedar, and some of wrought iron—to add to the degree of difficulty. That's how magic happens, even though this destination screen really is just a fence.

Currently I work in SketchUp with fancy photorealism plugins, but when I designed this project I was using an ancient 2D CAD program on a 12-year-old

desktop. Because we wanted to collaborate with local metal artist George Wycyka on the final design, we built the fence portion and left him with the three center panels to play with. You can't rush an artist, of course, so we gave him a couple of months and plenty of artistic license to come back with the metalwork. After the metal was installed, we added the black-painted cedar trelliswork to play off his spacings.

This fence is supported by red-cedar 6x6 posts set in 12-inch-diameter holes. To keep the posts stable, we filled the bottom half of the holes with concrete, then embedded the posts in the concrete. First, though, we coated the ground-contact portion of the posts with two-part marine epoxy for durability.

All the cladding parts were pre-cut out of red cedar as well, and prefinished with solid stain prior to installation. To help make the stain last longer, we sealed all the end cuts. Drip edges built into the top cap and the bottom rail are designed to shed water and enhance durability. And because we know that frost will eventually lift the patio stones, we stepped the bottom rail up off the patio a bit.

Finally, we topped the fence with rough-cut 4x10 quartersawn Doug fir beams, which we fastened to the posts with TimberLok screws sealed in with epoxy. ❖

*Lawrence Winterburn designs and oversees projects for GardenStructure.com, The Deck Store, and Paul Lafrance Design in Toronto, Ontario, Canada.*

PHOTOS: GARDENSTRUCTURE.COM

# PERFORMANCE YOU CAN MEASURE™



## THE 2018 STANLEY® FATMAX® TAPE

[WWW.FATMAXTAPE.COM](http://WWW.FATMAXTAPE.COM)

#FATMAXTape

**STANLEY  
FATMAX**

MADE IN  
**USA**  
WITH GLOBAL MATERIALS™

\*Standout claims based on maximum performance \*\*Compared to STANLEY® FATMAX® PRO-XL™ tape measure (FMHT33502) \*\*\*Usable after 50' drop onto packed soil

# ZIPWALL®

DUST BARRIER SYSTEM

800-718-2255

## Do it right.

**Start every job with ZipWall®.**

- Sets up in just a few minutes – brings in business for years
- No ladders, no tape, no damage

See how easy it is at [zipwall.com](http://zipwall.com).

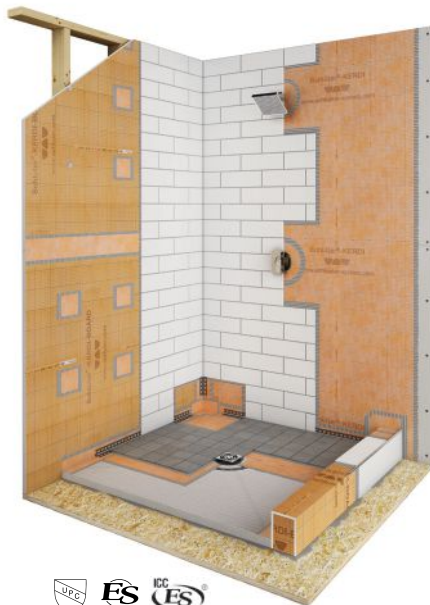


Building better showers  
doesn't have to cost more.



## Schluter®-Shower System

Complete waterproofing system for tiled showers



- No more leaking showers – fully sealed system
- Zero trade crossover – speeds up production schedule
- Eliminates mold, mildew and shower odors
- No call backs – reduces service costs
- Construct with KERDI membrane over standard drywall  
or KERDI-BOARD waterproof building panels



### We've got you covered!

When you install the Schluter®-Shower System with one of our Schluter® thin-set mortars, the installation is eligible for coverage under our Lifetime Thin-Set System Extended Limited Warranty.\*



BY MIKE GUERTIN

## Drip Edge and the IRC

**Roof drip edge** is one of those products that just doesn't get the attention it deserves from contractors or roofers. From product selection to installation details, drip edge often takes a back seat to the shingles or to eaves flashing (see "Drip Edge and Ice-Barrier Membrane," Mar/18). And that's too bad, because drip edge has a large impact on how water-resistant the eaves and rake edges are and how well the water drains over the fascia. It can also be a critical element for how well a roof performs and stays intact during a hurricane or other high-wind event.



### DRIP EDGE AND CODE SPECIFICS

When I started working on homes in the 1970s, installing metal drip edge was entirely the installer's choice. The International Residential Code (IRC) did not require metal drip edges along eaves and rake edges until the 2012 edition (See Code Requirements for Drip Edge, below left). So depending on where you work and what code prevails in that area of the country, metal drip edges still may not be required by code.

Section R905.2.8.5, Drip Edge, in the IRC spells out what the IRC requires: "A drip edge shall be provided at eaves and rake edges of shingle roofs. Adjacent segments of drip edge shall be overlapped not less than 2 inches. Drip edges shall extend not less than 1/4 inch below the roof sheathing and extend up back onto the roof deck not less than 2 inches. Drip edges shall be mechanically fastened to the roof deck at not more than 12 inches on center with fasteners (1, 2) as specified in Section R905.2.5 [roofing nails with minimum 12-gauge shank and 3/8-inch-diameter head]. Underlayment shall be installed over the drip edge along the eaves and under the drip edge along the rakes."

### LOOKING DEEPER IN THE CODE

When contractors check code provisions, they often check only the specific section addressing the building element they are tasked with and may overlook other code sections that relate to that building element. In the case of drip edge, another relevant section is Section R903, Weather Protection, and the subsection R903.1, General, which states: "Roof assemblies shall be designed and installed in accordance with this code and the approved manufacturer's instructions such that the roof assembly shall serve to protect the building or structure."

By and large, the wording of this section means that when the manufacturer's instructions have a higher or stricter standard for construction than the code itself, a local code official can require that the manufacturer's higher standard be followed. The IRC reiterates the point in Section 905.2.8, Flashing: "Flashing for asphalt shingles shall comply with this section and the asphalt shingle manufacturer's approved installation instructions."

Section R903.2, Flashing, starts out with a general statement of how flashing—including drip edge—must

### Code Requirements for Drip Edge

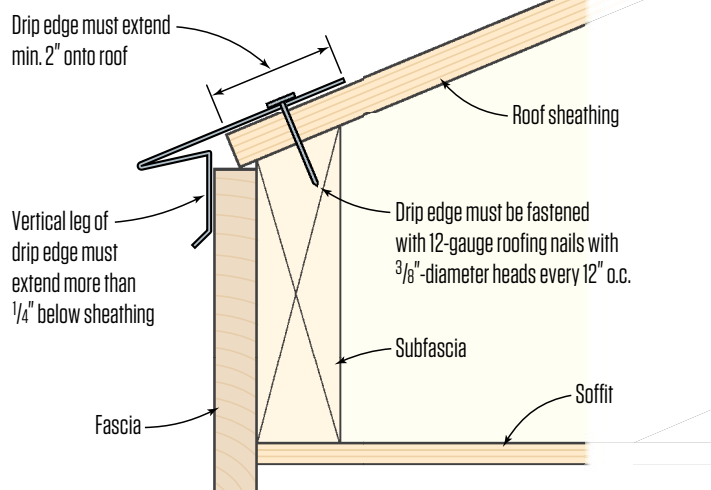


Photo this page by Mike Guertin; Illustration by Tim Healey



**Code requirements for nailing drip edge.** Code requires that the drip edge extend at least 2 inches onto the roof from the fascia board (1). This drip edge extends much farther. Nailing along the eaves should be spaced at no more than 12 inches on-center. Nailing should also be 12 inches on-center for rake drip edge (2). In both of these examples, the installer arranges the fasteners in a W pattern to put the drip-edge attachment closer to the edge of the roof.

be installed: “Flashings shall be installed in a manner that prevents moisture from entering the wall and roof through joints in copings, through moisture permeable materials and at intersections with parapet walls and other penetrations through the roof plane.” It’s not until you read further in that section that you find a sentence that describes the minimum standards for metal flashing material: “Where flashing is of metal, the metal shall be corrosion resistant with a thickness of not less than 0.019 inch (0.05mm or No. 26 galvanized sheet).” This is an important point to note. Even though the drip-edge corrosion resistance and minimum thickness are not called out specifically in the drip-edge subsection, the code does address them.

The problem is that many drip edges sold at building supply houses are only 0.011 inch thick and are often even thinner. The difference between 0.019 inch and 0.011 may not seem like a lot, but 0.011-inch metal is 42% thinner than 0.019-inch metal, and you can certainly feel the difference—especially when the two are side-by-side. And corrosion resistance can have a much different significance depending on whether you’re building inland or building near the ocean. Aluminum and galvanized steel may hold up for the lifetime of a roof in most areas, but they will corrode rapidly in coastal conditions.

**BEYOND THE CODE**

While the code recognizes the duties of drip edge in keeping moisture from getting into a house, it is an unsung hero when it

comes to the wind resistance of an asphalt shingle roof—especially along the perimeter of the roof, where the effect of high wind can be most pronounced and is most likely to cause damage. The Institute for Business and Home Safety (IBHS) developed the Fortified Home program along with a series of guides for building in hurricane and high-wind zones. These guides include sections on roofing best practices based on research and field examinations of roof performance in areas prone to high winds or hurricanes.

One take-away that I gleaned from the Fortified Home guides is that measures to help keep the perimeter shingles—along the eaves and rakes—in place are critical to maintaining roof integrity in severe wind. And the guides recognize that metal drip edge is an important element for keeping those perimeter shingles intact and in place during a wind event.

The Fortified Home guides go beyond the basic code requirements by recommending that drip-edge sections overlap at least 3 inches, and that the drip edges be fastened with roofing nails at 4 inches on-center in a two-row W pattern (3, 4). Ideally, there should be a 2-by subfascia or solid blocking between rafter or truss tails for sheathing attachment; the bottom row of drip-edge nails can be driven into that blocking.

The guides also address installing the starter courses of shingles along the eaves edge and the rake edge. They recommend installing the starter courses flush with the eaves and rake drip edges, or overhanging the drip edge by a maximum of 1/4 inch. Limiting

Photos by Roe Osborn



**Drip-edge nailing taken to the next level.** For regions prone to high winds, the Fortified Home program recommends that the nails for the eaves drip edge be no more than 4 inches apart (3), instead of the code-required 12-inch spacing for drip-edge nails. The recommendation for rake drip edge is the same (4). Nails should be driven in a two-row W pattern. The Fortified Home guidelines also call for the shingles along the eaves and rakes to be bedded in an 8-inch band of roofing cement.

how far the shingles overhang the drip edge reduces the chance that wind will be able to get under the shingles and lift them. I checked with the installation instructions of seven major roof-shingle manufacturers to see how they address the amount that shingles should overhang the drip edge. Almost all of them listed acceptable overhang distances from flush up to 1/4 inch.

The Fortified Home guides also call for bedding the eaves starter shingle and the rake-edge shingles in an 8-inch-wide band of asphalt roof cement, which cements the shingle to the drip edge, further strengthening the outermost edge of the roof in a high-wind event. In the field of the roof plane, self-sealing strips on the shingles should be adequate to bond the leading edge of shingles to the shingle underneath, keeping them in place.

### SHOPPING FOR DRIP EDGE

Drip-edge profiles are available in a variety of designs and sizes. You'll often see them designated as a "Type" or "Style" followed by a letter: A, C, D, F, L, T. These designations can get a bit confusing because manufacturers use different designations for similar-looking drip edges. When you boil it down, there are two basic drip-edge profiles suitable for asphalt shingles. One is a simple "L" shape with a 90-degree bend between the roof leg and fascia/rake leg (NRCA calls this Type L, but others refer to it as Type C). The other profile has an extended edge that projects past the fascia or rake boards by about 1/2 inch before bending into the vertical leg

(the NRCA calls this Type T, while others refer to it as Style D or extended drip edge). Either style of drip edge is suitable for eaves or rake use.

I generally choose the extended-style drip edge along eaves edges, so water rolling off the edge of the shingles will tend to drip away from the fascia and into a gutter. And to keep things simple, I use the same drip edge along rake edges. Some roofers prefer to use the extended drip edge along eaves edges and the L-shaped drip edge along the rakes.

It's important to get the proper size roof and fascia/rake legs when selecting the drip edge for your project. Wider roof legs provide more surface area for nailing. I usually select drip edges with at least a 4-inch roof leg along the eaves edge and a 2-inch leg along rakes. The code calls for the fascia/rake leg to extend 1/4 inch below the roof sheathing and the Fortified Home guides call for 1/2 inch. But I like to use drip edge with at least a 1-inch fascia/rake leg.

Neither the code nor the Fortified Home guides differentiate between the drip edge needed on a low-slope asphalt roof (2-in-12 to 4-in-12) and that needed for high-slope roofs (greater than 4-in-12). The extended-style drip edge would probably be a better choice along the eaves edge of a low-slope roof so the water drips off the edge away from the fascia.

*Mike Guertin is a builder and remodeler in East Greenwich, R.I., and a presenter at JLC Live. Follow him on Instagram @mike\_guertin.*

### 1. Moisture-Resistant MDF

All of Georgia-Pacific's UltraStock MDF panels are now manufactured using 100% no-added-formaldehyde (NAF) resin. The new formulation offers enhanced indoor air quality and environmental value, Georgia-Pacific says. In addition, UltraStock MR MDF now meets MR50 requirements, ANSI's highest designation for moisture-resistant MDF. UltraStock MR is ideal for interior settings where periodic exposure to moisture is likely, according to the manufacturer. UltraStock Select, Premium, Lite, Moulding, and Embossing meet MR10 standards. See distributor for pricing. [buildgpp.com](http://buildgpp.com)



### 2. Composite Shingles With an Aged Shake Look

DaVinci Roofscapes has introduced the Nature Crafted Collection, featuring three composite shake shingle colors that replicate the patina of time- and weather-worn wood shingles: aged cedar, mossy cedar, and black oak. DaVinci says the shingles are resistant to fire, impact, high winds, mold, algae, fungus, and insects. The collection comes with a lifetime limited warranty against cracking, curling, or fading. Pricing ranges from \$2.53 to \$5.53 per square foot. [davinciroofscapes.com](http://davinciroofscapes.com)



### 3. Weatherproof Hidden Fastener System

Deckorators has added rigid polymer nailing flanges to its Dexerdry decking gaskets so the weatherproofing system can also function as a hidden fastener system. Fastendry strips come in 12-foot, 16-foot, and 20-foot lengths. The wide flange fastens to the tops of joists with a nail gun, and the gaskets then fit into the slotted edges of the decking, forming a seal against rain, melting snow, and debris. Fastendry is designed for use only with Deckorators decking. It retails between \$2.75 and \$2.95 per lineal foot. [deckorators.com](http://deckorators.com)



### 4. Quartz With a Classic Style

Cosentino's Silestone brand has expanded its Eternal Collection with five new colors inspired by classic stone and marble: Bianco Calacatta, Calacatta classic, desert silver, emperador, and marfil. Silestone says that veining and highlights run completely through the material, and that the surfaces have enhanced color saturation, luster, water repellency, and impact and scratch resistance. Silestone retails from \$49 to \$110 per square foot based on color, thickness, and finish. [silestoneusa.com](http://silestoneusa.com)

BY KATHLEEN BROWN



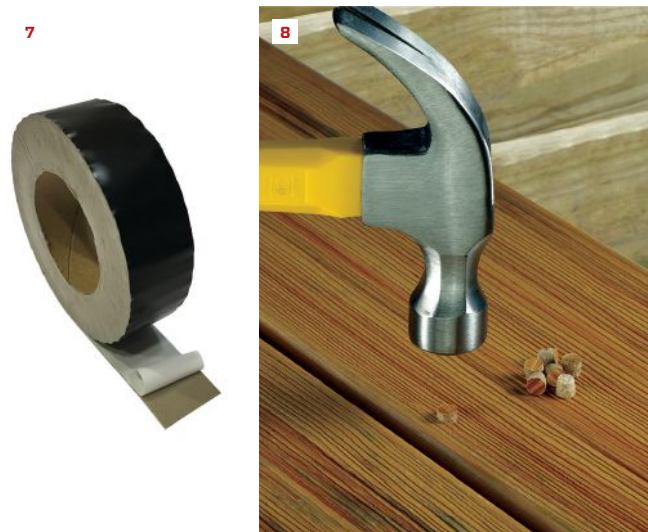
### 5. Lightweight Brick Facade

Authentic Brick is made of the same VOC-free, 100% fired clay as Meridian Brick's full-bed-depth bricks, but is 3 inches thinner and 70% lighter. The brick's 5/8-inch profile saves floor space while its light weight enables easier handling, quicker installation, and cheaper transportation. Authentic Brick is suitable for interior and exterior applications such as ceilings, exterior gables, and accent walls. Thirty-nine colors and three sizes are available. Pricing not available. [meridianbrick.com](http://meridianbrick.com)



### 6. Efficient Spray-Applied Insulation

Icynene-Lapolla recently introduced Foam-Lok 450 Spray Polyurethane Foam Insulation, an open-cell spray-foam insulation that can be left exposed in attics, crawlspaces, and interior spaces without the application of an additional ignition barrier. According to the manufacturer, this new foam adheres tenaciously to framing members and substrates, maintaining its effectiveness as an air barrier for the life of the building. Icynene-Lapolla also claims Foam-Lok 450 can fill a 2x6 wall cavity in a single pass. Pricing varies by project. [lapolla.com](http://lapolla.com)



### 7. Butyl Deck-Joist Protection

Imus Seal is a self-adhering, 20-mil-thick flashing tape that can be applied in temperatures ranging from 20°F to 180°F. The U.S.-made tape combines a pressure-sensitive 12-mil butyl waterproof membrane with a high-density polyethylene backing for strength, and according to the manufacturer, meets AAMA 711 performance standards. Designed to protect deck joists and beams, the 50-foot rolls are available in 1 5/8-inch, 4-inch, and 6-inch widths, for \$17, \$35, and \$50, respectively. [imusindustries.com](http://imusindustries.com)

### 8. Color-Matched Plugs

DuraLife has joined the list of decking manufacturers that offer a Cortex color-matched plug system. The polypropylene-and-hardwood-composite plugs are made from DuraLife deck boards, providing a color and wood-grain match with DuraLife's Siesta and Starter decking. Kits are available for eight colors (golden teak, Brazilian cherry, tropical walnut, garapa grey, pebble, coastal grey, mahogany, and slate) and include 300 plugs, 224 3-inch coated carbon-steel screws, and two setting tools—enough to install 100 linear feet of decking. MSRP for a 100-linear-foot box is \$75. [duralifedecking.com](http://duralifedecking.com)

### 9. Aluminum Rod Railing

Trex Signature rod railing brings a minimalist industrial design to residential settings, drawing on the company's acquisition of commercial architectural railing manufacturer SC Railing. Available in 36-inch and 42-inch heights and in 6-foot and 8-foot lengths, the aluminum railing sections come in three powder-coated color combinations: black/platinum, bronze/platinum, and black/black. Trex says the railing can be customized with different top rails and is compatible with Trex outdoor lighting components. The rod railing costs about \$90 per linear foot. [trex.com](http://trex.com)

### 10. 'Nickel Gap' Shiplap

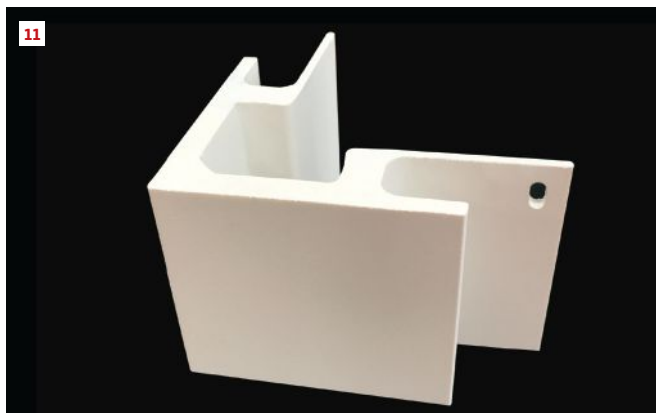
WindsorOne's Shiplap boards can be installed with up to a 1/2-inch gap between boards, as wall cladding, wainscoting, a porch lid, soffit, and more. Suitable for interior or exterior use, the boards can be installed vertically or horizontally with either a smooth side or a rough-sawn side displayed. The 16-foot radiata pine boards are coated with acrylic latex primer and are available in 5 1/2-inch or 7 1/4-inch widths. Pricing varies by lumberyard. [windsorone.com](http://windsorone.com)

### 11. A Streamlined Trim Appearance

Kleer Lumber's outside-corner trim with integrated nailing flange forms a 3/4-inch pocket around end cuts on vinyl, shake, shingle, and stone siding, creating a clean finish with no visible nails. The system incorporates a flat trimboard, J-channel brick, and corner piece for easy installation. Made from expanded cellular PVC, the corner will not splinter, rot, or swell, Kleer says. Components may be installed against the ground, masonry, or other wet surfaces. The 4-inch-by-20-foot corner retails for about \$125, and the 6-inch-by-20-foot corner for about \$180. [kleerlumber.com](http://kleerlumber.com)

### 12. Fire Membrane I-Joists

Boise Cascade has expanded markets for its AJS 24 FMJ Fire Membrane I-Joists. The joists come ready for installation in unfinished residential basements and are designed without specified top and bottom orientation to ensure correct framing. Boise Cascade says the joists are noncorrosive to fasteners and are lighter than equivalent 2x10 and 2x12 floor systems, with a wider nailing surface. The joists include a foil-faced insulation board and meet stringent durability and ICC-ES fire protection standards. Pricing varies by distribution market. [bc.com](http://bc.com)



STABILA®



**NEW**

The Most German,  
German Level...  
Ever!



Type **80T** 36" - 59" Millwork - Cabinets #29459 25" - 41" Doors - Windows #29441

stabila.com

**JLC**

**Content Licensing for  
Every Marketing Strategy**



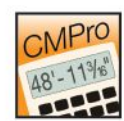
**Marketing solutions  
fit for:**

- Outdoor
- Direct Mail
- Print Advertising
- Tradeshow/POP Displays
- Social Media
- Radio & TV

Leverage branded content from JLC to create a more powerful and sophisticated statement about your product, service, or company in your next marketing campaign. Contact Wright's Media to find out more about how we can customize your acknowledgements and recognitions to enhance your marketing strategies.

Call Wright's Media at 877.652.5295  
visit our website at  
wrightsmedia.com/sites/hanleywood  
or email us at hanleywood@wrightsmedia.com

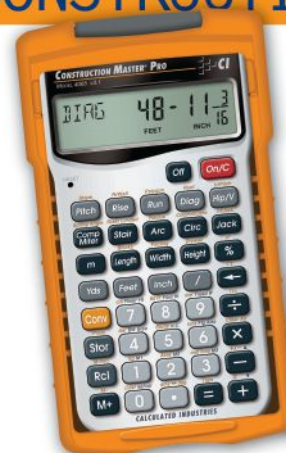
# THE ANSWER TO CONSTRUCTION MATH.



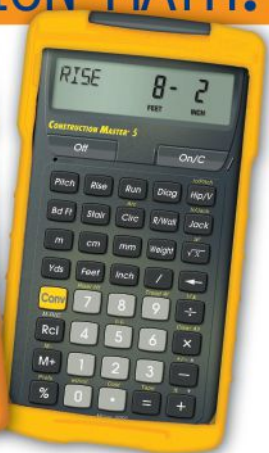
Available  
for iOS,  
Android and  
Windows



Available  
for iOS and  
Android



Construction Master Pro



Construction Master 5

**CONSTRUCTION MASTER DELIVERS SOLUTIONS.**

Save time and money using the Construction Master calculator or app at the jobsite, at your desk and on your laptop, phone or tablet.

Call 1-800-854-8075 for a dealer near you or go to [calculated.com](http://calculated.com) for information, videos and more.



## Weigh In!

Want to test a new tool or share a tool-related testimonial, gripe, or technique? Contact us at [JLCTools@hanleywood.com](mailto:JLCTools@hanleywood.com)

# DeWalt Cordless Wormdrive-Style Saw

BY TIM UHLER

**Last year**, I reviewed the Makita rear-handle cordless saw and gave it rave reviews. Before that, we had been using cordless saws for years but hadn't gone completely cordless, because the cons of cordless (less runtime and power) had outweighed the pros (mobility and elimination of trip hazards, for example). The Makita, however, tipped that balance. Then, at its annual media event in August, DeWalt announced its version of that saw: a 60V Flexvolt cordless rear-handle saw, which I was able to review.

The DeWalt is a blade-left, rear-handle saw that takes a single 9-Ah or 6-Ah 60V Flexvolt battery. DeWalt calls it a "wormdrive style" saw; it does not have a wormdrive motor, but it looks similar to the Skilsaw worm drives that have been commonly used by framers here on the West Coast since the 1950s.

## FEATURES

The battery sits right behind the motor and in front of the handle, keeping the weight relatively centered, which results in a balanced saw. The saw bevels to 53 degrees and just barely cuts through 2-by material at that angle. It has positive stops at 45 degrees and 22.5 degrees. The cutting depth, at 2<sup>3</sup>/<sub>8</sub> inches, matches most 7<sup>1</sup>/<sub>4</sub>-inch saws (the cutting depth of the Makita is 2<sup>9</sup>/<sub>16</sub> inches).

The magnesium baseplate offers an incredible line of sight when the saw is tilted to cut bevels. While I like that feature, I find that the baseplate "sticks" a little when I start a cut. I often enter a cut

with the saw tipped up slightly so that I'm starting with just the front edge of the baseplate on the material. This saw's baseplate is not rounded over enough, so the start is not as smooth using my usual method. Not everyone starts a cut this way, but it was noticeable enough for me that I needed to adjust my method slightly. The rafter hook is basically perfect: not too big, but big enough to hang off 2<sup>1</sup>/<sub>2</sub>-inch I-joists.

I have come to love blade brakes, and this DeWalt has an electronic brake that works well. This is a safety feature that should be on every saw. The guard never snagged when we made cuts, even compound miter cuts for jack rafters. In my world, a guard that works so well that you don't even realize it's there is a real plus.

Another feature that I liked is the dust port, which is on the side of the upper guard. It shoots a lot of sawdust as you cut. When framing outside, we taped the port up because the way it's oriented puts dust all over the cut area, obscuring the cut line. But I like having it because it gives us the option to hook up a vacuum with an attachment—something we'd do for interior demo work or the like.

## POWER

This saw has loads of power. It is a beast and spins the blade fast (to compare: the DeWalt runs at 5,800 rpm, the Makita runs at 5,100 rpm, and the corded Skilsaw runs at 5,300 rpm). The faster rpm translates to faster cutting, and this motor easily powers



## More power in a cordless package.

The Flexvolt 60V max cordless wormdrive-style saw features a blade-left design with a rear handle position. The 60V max battery (56V nominal) fits just behind the motor and in front of the handle. The saw has a bevel capacity of 53 degrees, with positive stops at 45 degrees and 22.5 degrees, and a depth of cut 2<sup>7</sup>/<sub>16</sub> inches at 90 degrees (just shy of being able to cut a 2<sup>1</sup>/<sub>2</sub>-inch I-joist in one pass). The author remarks that the 5,800 no-load rpm makes it the fastest-cutting in-line saw—corded or cordless—on the market. The rafter hook is the same as on the corded DeWalt wormdrive and will fit over 3-by material.



**Good sight lines, but not the best balance.** The saw doesn't get bogged down; it powers through LVL, even at a 53-degree

bevel, and it has a great sight line for making cheek cuts. The author notes that it's not quite as well-balanced as the Makita, and that it is also much wider. The grip is also smaller, and it's a little harder to push this saw straight when ripping sheet goods. A dust port on the back of the upper blade guard efficiently shoots sawdust away from the cut, and better still, offers the option of adding dust collection. Here, the port is taped closed to keep the blow-back out of the operator's face when cutting at this angle.

Photo: Tim Uhler

through LVL, even ripping LVL or cutting compound miters through LVL. I think this is the most powerful 7<sup>1</sup>/<sub>4</sub>-inch saw I've ever used, and if that is what you need, this is your saw.

**Runtime.** The big question with cordless tools is runtime: How much work can you get done on a single, fully charged battery? With some tools and in some applications, it's unlikely that you're going to be able to outwork a battery before a second one is fully charged, so runtime is a non-issue if you've got two batteries on hand. That's not the case here, because we're talking about a framing saw that typically sees frequent use.

On some days, when we were doing pickup framing and siding, we could use the saw all morning and put the battery on the charger at lunch and never run out of battery. The 9-Ah battery takes 81 minutes to charge (I timed it from zero). We can easily drain a battery in that time frame if we are doing a lot of ripping or cutting stair stringers, for example. When we were cutting siding (which required a lot of ripping and gang-cutting), we got about two hours out of one battery.

If you're a framer hoping to use this saw all day long, I recommend having three 9-Ah batteries on hand so that you never have downtime. You could get away with having just two most of the time, if one is always charging, but if you have a heavy cutting day—for instance, cutting stairs or rafters—a third battery would be best.

#### IS IT WORTH BUYING?

I found this kit with one 9-Ah battery on Amazon for \$400. Look around, though; sometimes distributors run deals that offer a free battery.

One factor to consider is that going cordless means you don't need expensive cords. We always run 100-foot 12/3 15-amp cords, which cost about \$75 each. They get nicked, the ends go bad, and depending on your company policy, they may need to be taken out of service if there is any damage to the cord. Then there is the time it takes to roll out and roll up the cords, as well as the time spent down when the power trips if too many people are running tools off the same circuit, and so on.

Now we have only one power cord rolled to the job (besides the one to the van to power the chargers). This means less time wasted with cords, more room in the van, and a safer site. I cannot oversell the convenience of cordless tools like this.

*Tim Uhler is a lead carpenter for Pioneer Builders in Port Orchard, Wash. He is a contributing editor to JLC and Tools of the Trade. Follow him on Instagram @awesomeframers.*

## Skilsaw Heavy-Duty Wormdrive Table Saw

BY TIM DONBECK

The **Skilsaw SPT99 10-inch wormdrive table saw** is a newer, beefier version of the SPT70. Prior to reviewing the SPT99, I had been using an old 8 $\frac{1}{4}$ -inch Makita saw that I've had for more than 20 years, so I was ready for a new table saw when the opportunity arose to review this one.

After assembling the stand and mounting the saw, I loaded it into the back of my truck. It's heavy! With the stand, the saw weighs in at close to 100 pounds. Many portable-table-saw stands have smaller wheels, but this stand's wheels are extra large, at 16 inches in diameter. The large wheels made rolling the saw across rough terrain and up stairs very easy but added to the weight.

The first thing I noticed when turning the saw on is that it's quieter than most other portable table saws I have used. After running a few hundred lineal feet of  $\frac{5}{4}$ -inch white oak through it, I was impressed by its power. According to the specs, with a 15-amp motor, it will cut a full  $3\frac{5}{8}$  inches deep. To test this, I put the blade all the way up and ran a piece of  $3\frac{1}{2}$ -inch oak through; the saw cut through the stock without effort.

The rack-and-pinion-style fence is easy to adjust and was accurate out of the box. Locking the fence in place is done via a cam lock that snaps down securely. The total rip capacity is impressive at  $30\frac{1}{2}$  inches. As on other saws on the market, the fence features a flip-over guide for ripping thinner material. Another nice fea-

ture of the saw is that all the accessories can store on board.

After using this saw for a few months, I can attest that it cuts very well. The model that we received came with a 30-tooth Diablo blade, which cut well until someone hit it with a screw. We then ran the saw with a 60-tooth Diablo finish blade. The saw cut smooth as glass in oak and anything else we ran through it—producing really nice glue-line rips.

I did have a few quibbles with the saw. The first is that the dust chute is not durable. While it does a good job collecting dust (I didn't use the dust collection often, but instead captured dust into a bucket), the chute cracked easily. It's made out of a thin, hard plastic and broke the first time the dust elbow was bumped. It's usable—but disappointing, considering how solid and well-made everything else on the saw is. Another gripe I had is that it has no spot to hold extra blades. Finally, I found that sawdust built up in the blade adjustment slide—so much so that it wouldn't let the blade drop below the surface of the table. With constant dust collection, the sawdust may not build up—but it's worth nothing in case you don't use dust collection regularly.

Despite those minor downsides, I'd still consider this saw worth buying. At \$580, it's a good buy for the features and quality.

*Tim Donbeck is a lead carpenter living in Gansevoort, N.Y.*



**Big wheels and a sturdy frame.** The SPT99 comes with a zero-gravity rise stand that's equipped with 16-inch wheels. The large wheels are stout and sturdy, making it extremely easy to maneuver around a rough jobsite or up stairs. While the saw is heavy, it loads easily into the back of a pickup.



**Wide rip capacity with a side support.** The table saw has a  $3\frac{5}{8}$ -inch depth of cut and a  $30\frac{1}{2}$ -inch rip capacity. Once the stand is opened, its handle acts as a support for sheet goods. Adjustable feet allow you to fine-tune the stand's base. A removable elbow allows you to direct dust into a bucket.

ENGINEERED TO MEET THE DEMANDS OF THE WORLD'S MOST SKILLED BUILDERS



**SuperFinisher®**



NF255FA/18



NF565A/16



NF665A/15

**SuperStapler®**



TA238B/18-6



TA551B/16-11



SPECIAL PRICING AVAILABLE ON ADVERTISED FINISH TOOLS AND STAPLERS  
APRIL 1, 2018 - MAY 31, 2018. CONTACT YOUR LOCAL DEALER FOR PRICING.

**MAX** BUILDING OUR WORLD

WWW.MAXUSACORP.COM

800.223.4293



**A Better Way to Flash**



New Technology



Traditional Method

Safeguard new or renovated residential window and door installations from unwanted air, moisture and mold with Professional Grade Flashing products.

**Blue Barrier™**  
**Flash 'N Wrap™ 2400**

- Easy application in wet conditions
- Tenacious adhesion, no gaps
- Eco-friendly, low VOC's
- No primers / No mixing
- Very Durable



**WindowSeal®**  
**Flashing Tapes**

- AAMA-711 Verified
- Comes in various widths
- Self-adhering, self-sealing
- Flash door & window frames
- Easy to remove film release liner



Also Available:

- Butyl Flash (can be applied as low as 15°F and as hot as 110°F)
- Aluma Flash (UV exposure 365 days)



www.Poly-Wall.com  
Contact Dan Thomas: (317) 610-1617

## CableRail for Composite Sleeved Posts

Our stainless steel fittings are specially designed for composite sleeved wood posts with extra-long lag bolts to maximize penetration into the core and automatic-locking Quick-Connect® jaws that make cable attachment a breeze.

Learn more.  
1-800-888-2418 or  
[www.feeneey7.com](http://www.feeneey7.com)



## May Advertising Index

Advertiser	Page #
Advantage Trim & Lumber	PDB 10
AFCO Industries, Inc.	PDB 16
All-Time Manufacturing Co., Inc.	NE6 *
Atlantis Rail Systems	PDB 24
Cable Connection, The	PDB 2
Calculated Industries	55
CertainTeed Saint-Gobain	2, 38
Chamberland Cedar	NE7 *
Chief Architect	10
Deckorators	PDB 26
Decks Unlimited	PDB 23
DeckWise	PDB 25
DigSafe	NE7 *
Dryerbox	16
DuPont Tyvek	C4
DuraLife	PDB 37
Fairway Architectural Railing Solutions	PDB 18
FastenMaster	18, PDB 4
Feeneey, Inc.	4, PDB 20, 60
Festool USA	13
Fiberon	PDB 29
Fortress Railing Products	PDB 11
Grabber Construction Products	PDB 12
Great Southern Wood Preserving	PDB 19
Harvest Homes, Inc.	NE6 *
HIDfast, Inc.	PDB 39
Holden Humphrey Co.	NE7 *
Hood Distribution	NE3 *
Huber Engineered Woods, ZIP System	14
Inteplast Group LTD.	8
Invis-A-Rail	PDB 39
JELD-WEN Windows & Doors	NE1 *
JLC Field Guide	7 *
JLC Newsletter	NE8 *
JLC Website	NE2 *
Key-Link Fencing & Railing	PDB 23

JESSE H.  
NEAL  
AWARDS  
Est. 1955

## Congratulations

TO HANLEY WOOD'S JESSE H. NEAL AWARD WINNERS

Hanley Wood is committed to publishing quality content that serves the information needs of construction industry professionals. Our editors have once again been honored by the most prestigious editorial awards program. Join us in congratulating them.

### 2017 WINNERS

ARCHITECT Best Overall Art Direction/Design	ARCHITECTURAL LIGHTING Best Commentary/Blog
---	---

### 2017 FINALISTS

AFFORDABLE HOUSING FINANCE	JOURNAL OF LIGHT CONSTRUCTION
ARCHITECT	MULTIFAMILY EXECUTIVE
ARCHITECTURAL LIGHTING	PROSALES
BUILDER	REMODELING

hanleywood

Advertiser	Page #
Koppers Performance Chemicals	PDB 34
Liberty Cedar	NE6 *
Lonza Wood Protection	PDB 17
Lumberock Premium Decking	PDB 41
MAX USA Corporation	59
Metrostudy	9 *, NE5 *
MFM Building Products Corp.	PDB 23
MoistureShield	PDB 3, PDB 5
Panasonic	45
Placid Point Lighting	PDB 31
Poly Wall Building Solutions	59
Protective Products	61
Protecto Wrap Company	PDB 8
RAM Commercial Trucks	C2-1
Remodeling Cost vs Value	NE4 *
RIKON Power Tools	30
Royal Building Products	PDB 9
Sakrete	46
Schluter-Systems	48
ShurTech Brands	C3
Simpson Strong-Tie	5, 25, PDB 15
SoftPlan	4
SplitStop Screws	PDB 22
Stabila	55
STANLEY FATMAX	47
Sure Drive USA	PDB 25
The Deck Barn	PDB 41
Tjernlund Products	61
Trex	PDB 6
Trus Joist by Weyerhaeuser	7 *
TYPAR	6
Velux	17
Westech Building Products	PDB 24
Weyerhaeuser Diamond OSB	9 *
Wild Hog Railing	PDB 33
ZipWall	47

\*Advertising appears in regional editions

## Classifieds

**FLEXJAMB**  
Eco-Friendly  
Jamb Protection,  
Heavy-Duty and  
Reusable.

**Protective Products**  
International Inc.  
Surface Protection Solutions

ProtectiveProducts.com  
(800) 789-6633

**XchangeR™ Improves Indoor Air Quality. Cures Damp-Musty Basements.**

Also great for garages, cabins, storage areas & workshops

2 reversible 90 cfm fans supply air, exhaust or provide a balanced exchange. Magnetic damper stops, dehumidistat & separate on/off switches for each fan included.

**UnderAire™ Crawl Space Ventilators**

Quickly reduces moisture helping to protect both home and occupants

Ventilates excess moisture, the cause of mold, mildew & wood rot. Helps vent radon, treated wood off-gassing & odors that might otherwise migrate into living areas.

**Tjernlund Products, Inc.**  
800-255-4208 • tjernlund.com

Would you like to place your ad in *JLC's* special advertising section?

Contact:

**Maura Jacob**

**678.451.8627**

**mjacob@hanleywood.com**



BY JIM BENNETTE

## Beware Coal Tar Pitch

**Have you ever been asked** to cut a new curb into an existing built-up roof, say on an older home or a small commercial structure? Maybe you've been asked to do a complete tear-off? If so, during the demolition, did your eyes start to burn from the demo dust permeating the air? Or worse yet, after you labored in the sun for a while demoing the roofing, did your skin turn a horrible red color? If these symptoms sound familiar, it's likely that you were handling coal-tar-pitch roofing.

**Two types of BUR.** Coal tar pitch is a by-product of converting coal into coke for steel manufacturing—and, way back when, of gasifying coal to make illuminating gas—whereas asphalt is a by-product of refining petroleum. Visually they're similar, but chemically they are much different. In general, the built-up roofing (BUR) industry has been declining since the 1970s, with the advent of reliable single-ply membranes, though asphalt BUR is still installed today. New coal-tar-pitch roof installations, however, are extremely rare.

Because of the different properties of asphalt and coal tar pitch, roofers were careful not to mix the two materials on the same project. Application tools—such as melting kettles, mops, and mop carts—needed to be dedicated to either pitch or asphalt. Also, each had its own specific felt membranes and mastic products: pitch paper and mastic for pitch roofs, and asphalt paper and mastic for asphalt roofs.

**BURs with PAHs.** Coal-tar-pitch roofing is particularly pungent and contains a slew of harmful chemical compounds (asphalt roofing is relatively benign compared with pitch).

These include carcinogens such as benzene and polycyclic aromatic hydrocarbons (PAHs). Chemical irritants in the dust are the primary cause of burning eyes and red skin—red skin being a phototoxic response to these chemicals and subsequent exposure to the sun.

Health risks aside, coal tar pitch has proven to be one of the most resilient roofing products ever. Its low melting point—lower than asphalt—allows it to “self-heal.” There are pitch roofs out there that are 50 years old or even older. As a result, we frequently run into them today. In most cases, we try to leave pitch roofing in place (if the deck's in good shape). We remove any loose gravel from its top coat, then install the new roofing over it.

**Pitch initiation.** When I started out as a union roofer in the 1980s, you weren't considered a real roofer until you ripped your first pitch roof—“getting the burn,” they called it. Seasoned roofers laughed off the pain and told you to toughen up: “Drink a beer, kid, and forget about it.” That was the attitude. A lot of fledgling roofing careers were cut short by this “pitch initiation.” I can remember jobs where we went to lunch, and some guys didn't come back. They were gone. Some didn't even come back for their paychecks.

Today, topical pitch creams and gels are available (as well as protective “pitch” hoods—pull-over hoods made from Dacron) to help combat “the burn.” Tear-off crews typically now wear respirators and safety goggles—a far cry from the old tar-and-gravel crews back in the day.

*Jim Bennette owns and operates J Bennette Roofing, in Sagamore Beach, Mass.*



There are two types of built-up roofing (BUR): asphalt and pitch. Here, a tear-off crew begins work on a circa 1950s “pitch” roof. The inset photo shows a tar-and-gravel crew installing a pitch roof. There were three main guys on an install crew: a mop man, a paper setter, and a kettle man. The mop man ran the roof and skillfully glided the mop (pitch mops were twice as heavy as asphalt mops); the paper setter followed his lead; and the kettle man arrived on site early to start the kettle and kept it full during the day. Apprentices lugged the “hot” from the kettle to the carts.

Photos: Color photo, Jim Bennette; inset, James McCawley, Roofing, Estimating, Applying, Repairing

# DUCK PRO<sup>®</sup>

BRAND DUCT TAPE



***THE BRAND YOU KNOW  
BUILT FOR THE PRO™***



***HOLD. BUNDLE. REPAIR.***



**EXCLUSIVELY AT**





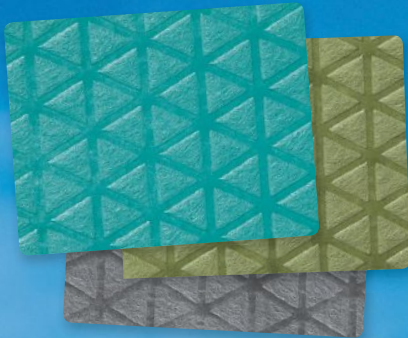
Tyvek.

# EXPERIENCE THE DIFFERENCE

Tyvek® Protec™ is a high-performance, effective, synthetic underlayment with industry-leading walkability. Deliver the performance your customers demand and the protection your crew deserves with Tyvek® Protec™.

## TRY IT FOR FREE

Get a 2 square roll of your choice\* at [tyvek.com/protec](http://tyvek.com/protec)



\* Limited-time offer. While supplies last.

Industry-leading walkability when compared to other low permeability synthetic roofing underlayments.

Copyright © 2018 DuPont. All rights reserved. The DuPont Oval Logo, DuPont®, For Greater Good®, Tyvek® and Tyvek® Protec™ are trademarks or registered trademarks of E.I. du Pont de Nemours and Company or its affiliates.



**Tyvek**  
**Protec**  
ROOFING UNDERLAYMENTS

FOR  
GREATER  
GOOD™