

**Installing High-  
Performance  
Windows**

---

**Common Siding  
Failures**

---

**Pocket Hole  
Joinery**

---





**DO IT RIGHT.**

# HIGH PERFORMANCE ISN'T JUST ON THE ROAD...IT'S ON THE HOUSE

**GRACE WEATHER PROTECTION SYSTEMS DELIVER PREMIUM PERFORMANCE**

**ROOF IT RIGHT. FLASH IT RIGHT. SEAL IT RIGHT.**

Roofing Underlayments, Weather Resistive Barriers and Flashings.  
Premium performance products installed by Pros in the Know is a  
winning combination. A solution that stands out from the crowd.

**GRACE**

Visit [graceprosintheknow.com](http://graceprosintheknow.com) | Follow us @GraceGCP

# THE POWER OF COMMUNITY

WATCH VIDEOS. READ THE LATEST BLOG POSTS. INTERACT WITH PEERS.

**JOIN TODAY**

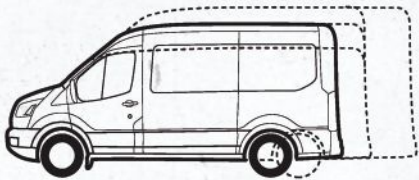


[graceprosintheknow.com](http://graceprosintheknow.com)

[facebook.com/graceprosintheknow](https://facebook.com/graceprosintheknow) | [twitter.com/GraceGCP](https://twitter.com/GraceGCP)

## INTRODUCING THE NEW FORD TRANSIT

# THE MOST VEHICLE CONFIGURATIONS IN ITS CLASS.\*



## A WIDE VARIETY OF DIMENSIONS

The Transit van and wagon are available in 2 different wheelbases, 3 different lengths and 3 different heights. That makes it easy to choose one that will fit you and your business exactly. And if that's not enough, it's also available as a chassis cab and cutaway.



THE NEW  
**2015  
TRANSIT**

## OPEN FOR BUSINESS



The Transit van is available with the best-in-class maximum rear cargo door opening height. The doors open a full 237° and the floor is as low as 28 inches.\*\* It's all about making loading and unloading easier. No matter what your business is.

## ↑↑ OVER ↑↑ 6'5" TALL\*\*



With an available cargo ceiling taller than some basketball players, the Transit van has loads of room for boxes, tools and you. That comes in handy if you want a mobile workshop that lets you stand up straight. And the advantages just keep piling up.



• THE NUMBERS DON'T LIE •

\*Based on body type, body length, and wheelbase and roof height. Class is Full-Size Vans. \*\*When properly equipped.

<sup>1</sup>Class is Full-Size Vans, when properly equipped. Excludes diesel competitive models.



The 2015 Transit can offer a best-in-class gas-powered maximum **CARGO CAPACITY OF 487.3 CUBIC FEET.<sup>1</sup>**



**Because you're not just  
constructing a deck - you're  
building your reputation.**

If you're looking for the next way to add even more lifelong value to your decking projects, rely on the brand that offers the most in outdoor living solutions. For longevity, style and performance, Make the TrexDecision™ by visiting [trex.com](http://trex.com).



Engineering What's Next  
in Outdoor Living™



## FEATURES

### 39. Common Siding Failures

Avoid errors that can cause a fiber-cement job to fail

### 47. Installing High-Performance Windows

Installation details must perform as well as the window itself

### 55. A Builder's Guide to Pocket Hole Joinery

An efficient and durable way to join wood on site



## DEPARTMENTS

### 13. Letters

Benefits of advanced framing; arc-fault requirement; heat pump water heater

### 15. Q&A

Small-shop compressed-air piping; nailing wood flooring

### 19. On the Job

Air-sealing a chimney chase; refinishing a hail-damaged home

### 27. Business

Three ways to price yourself out of business

### 33. Troubleshooting

Draining low-slope roofs

### 63. Energy

Energy codes force framing evolution

### 65. Products

Quiet dishwasher; barrier-free shower; deck railing; interior doors; digital tape measure; energy-efficient windows; wall-mount heat pump; more

### 71. Toolbox

Framing nailer; long-nose pliers; tool-to-vac hose kit

### 79. Advertising Index

### 80. Backfill

An old mansion houses a mysterious mix of trim styles



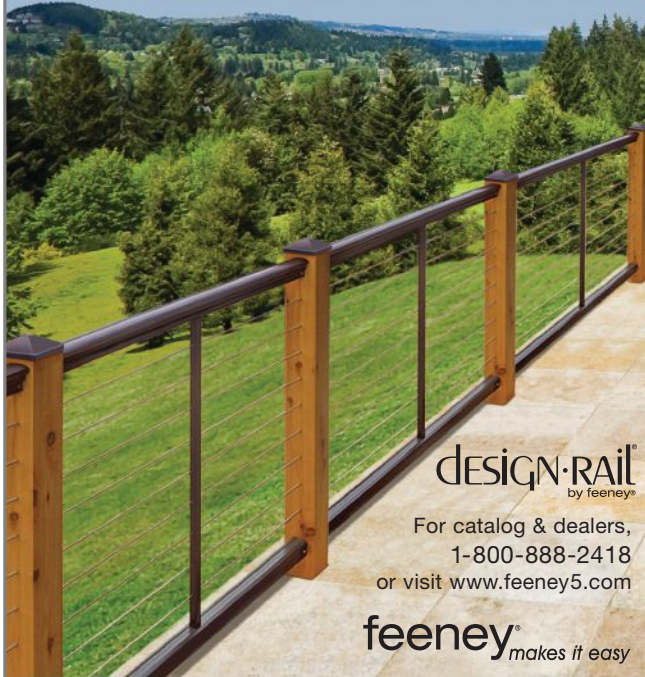
On the cover: Steve Demetrick, a builder and remodeler in Wakefield, R.I., carefully applies flashing tape to seal an opening for a high-performance window in a 12-inch-deep wall. Photo by Roe Osborn.

THE JOURNAL OF LIGHT CONSTRUCTION (ISSN 1056-828X), Volume 34, Number 1, 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 2015 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 The Journal of Light Construction, PO Box 5853, Harlan, IA 51593.



## Customer Satisfaction Made Easy

*DesignRail*® Aluminum Rail Kits offer your customers a beautiful, ultra-low maintenance, view-friendly railing option that easily mounts between wood posts. Kits include a powder-coated top rail, bottom rail and intermediate picket, pre-drilled to support 1/8" *CableRail* by Feeney cables (sold separately).



**DESIGN·RAIL**  
by feeney®

For catalog & dealers,  
1-800-888-2418  
or visit [www.feeney5.com](http://www.feeney5.com)

**feeney**®  
makes it easy

**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.

### 2015 WINNERS

REMODELING  
Best Cross-Platform Package  
ARCHITECTURAL LIGHTING  
Best Media Brand  
ARCHITECT  
Best Use of Social Media  
POOL & SPA NEWS  
Best Technical Content

### 2015 FINALISTS

MULTIFAMILY EXECUTIVE  
REMODELING  
ARCHITECT  
ARCHITECTURAL LIGHTING  
JOURNAL OF LIGHT  
CONSTRUCTION  
PROFESSIONAL DECK  
BUILDER

**hanleywood**

# JLC

JLCONLINE.COM

### Group Editorial Director, Residential Construction

John McManus, [jmcmanus@hanleywood.com](mailto:jmcmanus@hanleywood.com)

**Editor in Chief, JLC Group** Clayton DeKorne, [cdekorne@hanleywood.com](mailto:cdekorne@hanleywood.com)

**Managing Editor** Laurie Elden, [lelden@hanleywood.com](mailto:lelden@hanleywood.com)

**Chief Design Director** Aubrey Altmann, [aaltmann@hanleywood.com](mailto:aaltmann@hanleywood.com)

**Senior Editors** Ted Cushman, [tcushman@hanleywood.com](mailto:tcushman@hanleywood.com); Chris Ermides,

[cermides@hanleywood.com](mailto:cermides@hanleywood.com), Tim Healey, [thealey@hanleywood.com](mailto:thealey@hanleywood.com);

Roe Osborn, [rosborn@hanleywood.com](mailto:rosborn@hanleywood.com)

**Chief Editor—Products** Lauren Hunter, [lhunter@hanleywood.com](mailto:lhunter@hanleywood.com)

**Contributing Editors** Michael Byrne, David Frane, Dave Holbrook,

Joe Stoddard, Jon Vara, Charles Wardell, Andy Wormer

**Senior Web Developer** Braddock Bull,

[bbull@hanleywood.com](mailto:bbull@hanleywood.com)

**Digital Content Strategist** Austin Heller,

[aheller@hanleywood.com](mailto:aheller@hanleywood.com)

**Production Director** Theresa A. Emerson

**Digital Ad Manager** Annie Clark

**Ad Production Coordinator** Bernadette Couture

**Group Director, Audience Marketing & Circulation**

Christina Lustan

**Customer Service Manager** Lois Landa

**Circulation Promotions Designer** Chara Anderson

**President, Contractor Group** Rick Strachan

### HANLEY WOOD MEDIA

**President** Dave Colford

**Executive V.P., Strategic Marketing Services**

Tom Rousseau

**Senior V.P., Strategic Marketing Services &**

**Consumer Media** Jennifer Pearce

**Senior V.P., Audience Operations** Sarah Welcome

**V.P., Product Development** Rizwan Ali

**V.P., Client Operations** Mari Skelnik

**Senior Director/Print Production** Cathy Underwood

### PUBLISHED BY HANLEY WOOD

**Chief Executive Officer** Peter Goldstone

**Vice Chairman** Frank Anton

**Chief Financial Officer** Matthew Flynn

**President, Media** Dave Colford

**President, Digital** Andrew Reid

**President, Marketing** Jeanne Milbrath

**President, Metrostudy** Christopher Veator

**Senior V.P., Marketing** Sheila Harris

**Senior V.P., Corporate Sales** Paul Mattioli

**Senior V.P., Corporate Development &**

**General Counsel** Mike Bender

**V.P., Business Planning & Analysis** Ron Kraft

**V.P., Corporate Controller** Keith Rosenbloom

### Editorial & Advertising Offices:

**The Journal of Light Construction,**

186 Allen Brook Lane, Williston, VT 05495,

802.879.3335, Fax: 802.879.9384

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.

# MEET CODE. LOWER COST.



View a LedgerLOK  
installation video



LedgerLOK is the #1 structural wood screw used by professional contractors nationwide to meet code and lower costs for making deck ledger connections.

**Meet Code:** Tested and proven to meet 2012 IRC requirements for deck ledger to rim joist connections.

**Lower Cost:** Requires no predrilling, saving time and labor.

LedgerLOK is part of the FastenMaster LOK Line family of structural wood fastening products. Visit our website to learn more, download technical documentation, watch an installation video or find a dealer near you.

## DECK LEDGER TO RIM JOIST CONNECTION

Fastener	1/2" Lag Screw	LedgerLOK
Code-Compliant	✓	✓
Predrilling	✓	NONE
Installation Time	1 min, 22 sec	7 sec

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

800-518-3569

 **LedgerLOK**<sup>®</sup>  
Structural Wood Screw



## ENDURING DESIGN

### A HOME FOR LIFE

Every day more than 10,000 baby boomers turn 65. A recent survey by AARP found that while 84% of baby boomers want to stay in their current home during retirement, only 16% have taken any steps to adapt their home. REMODELING's Home for Life project demonstrates how a fresh design can enhance current space while anticipating future needs.

Take the virtual tour designed for remodeling pros. You'll find ideas and insight to help you:

- Identify the most requested aging-in-place projects
- Market more effectively to baby boomers
- Explore room-by-room projects with a multimedia home tour

**TAKE THE TOUR: HOMEFORLIFE.NET**

SPONSORED BY



## INFORMATION DIRECTORY

### CONTACT INFORMATION

**jlonline.com**; 802.879.3335

**JLC**

186 Allen Brook Lane  
Williston, VT 05495

### 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 [jlc-editorial@hanleywood.com](mailto:jlc-editorial@hanleywood.com). Keep copies of all original materials.

### SUBSCRIPTION SERVICES

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

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

**Email:** [jlc@cdsfulfillment.com](mailto:jlc@cdsfulfillment.com)

**Phone:** 877.277.2721

**Mail:** **JLC**, P.O. Box 5853, Harlan IA 51593-1353

You can subscribe online at:

[jlonline.com/subscribe](http://jlonline.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 required on subscriptions mailed to DC (5.75%), GA (4%), VT (6%).

### JLC ARCHIVE/BACK ISSUES

**JLC** subscribers have free access to every issue of **JLC** since 1986. Enable your free access at [jlonline.com/register](http://jlonline.com/register). You can also purchase a USB flash drive of all issues since 1986 at [jlonline.com](http://jlonline.com). Copies of individual back issues can be purchased for \$4.95 each, plus \$5 shipping per order. Call 877.277.2721 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 [omeda.com/jlcupdate](http://omeda.com/jlcupdate)

**For list rentals:** Statistics, Jennifer Felling, 203.456.3339, [j.felling@statistics.com](mailto:j.felling@statistics.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 877.277.2721.



HANDCRAFTED  
IN AMERICA. 

# TRUST IS A BEAUTIFUL THING.

ALMOST AS BEAUTIFUL AS OUR WINDOWS.

Our knowledgeable dealers provide personal attention and individual solutions for each of your projects, because we know that every job counts.

This level of service, combined with four generations of product innovation, and high-quality windows and doors, means peace of mind at every stage in your project. At Marvin, every detail makes a difference.

**MARVIN**   
Windows and Doors

Built around you.®

Experience the Marvin difference at [TheMarvinDifference.com](http://TheMarvinDifference.com)

2015  
**THE NEW AMERICAN HOME**



**TAKE THE VIRTUAL TOUR TODAY AT  
 NEWAMERICANHOME2015.COM**

Tour **The 2015 New American Home** showcasing cutting-edge building technology, products and materials that can be integrated into a production community. Built and designed by Blue Heron, the 2015 New American Home was created as a production floor plan to be sold and built with various structural and finish options in the Sky Terrace community. See for yourself!

**Builders: Take the tour—and register to win a \$1,000 credit from 84 Lumber's Green Edge Supply.**



**Title Sponsor**



**Founding Sponsors**



**Project Partners**



**Supporting Sponsors**

American Gas Association | DuPont Surfaces  
 JELD-WEN | Trane

**Alliance Sponsors**

Baldwin | Bayer Materials Science | Behr  
 Broan-Nutone | Progress Lighting

**Participating Sponsors**

84 Lumber | Bosch Thermotechnology  
 CertainTeed Gypsum | Clopay | Garaventa Lift  
 Gladiator Garage Works | Hart & Cooley  
 IAPMO | Kingspan Insulation | Lamps Plus  
 LiftMaster (Chamberlain)



**SALES OFFICES**

**HEADQUARTERS**

**Rick Strachan** President, Contractor Group  
 202.736.3332 Fax: 202.785.1974  
 rstrachan@hanleywood.com

**Trow Meier** Vice President, Sales, Remodeling &  
 Distribution Groups  
 773.824.2417 Fax: 773.824.2540  
 tmeier@hanleywood.com

**NORTHEAST/MID-ATLANTIC**

**Jamie Volpe** Senior Strategic Account Director  
 (Including CT, DC, DE, MA, MD, ME, NH,  
 NJ, NY, PA, RI, VA, VT, WV)  
 203.397.1231 Fax: 203.397.1168  
 jvolpe@hanleywood.com

**MIDWEST/ SOUTHEAST**

**Clare O'Dower** Strategic Account Manager  
 (Including AL, FL, GA, IL, KY, MI, NC, OH,  
 SC, TN)  
 202.372.5665 Fax: 773.824.2401  
 codower@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 Fax: 773.824.2401  
 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 Fax: 831.373.6069  
 cweinman@hanleywood.com

**NEW ENGLAND/MID-ATLANTIC  
 REGIONAL EDITIONS**

**Phil Guerra** Account Manager  
 516.586.4797 Fax: 202.452.1126  
 pguerra@hanleywood.com

**CANADA**

**John Magner** York Media Services  
 416.598.0101  
 Fax: 416.598.9191  
 jmagner@yorkmedia.net

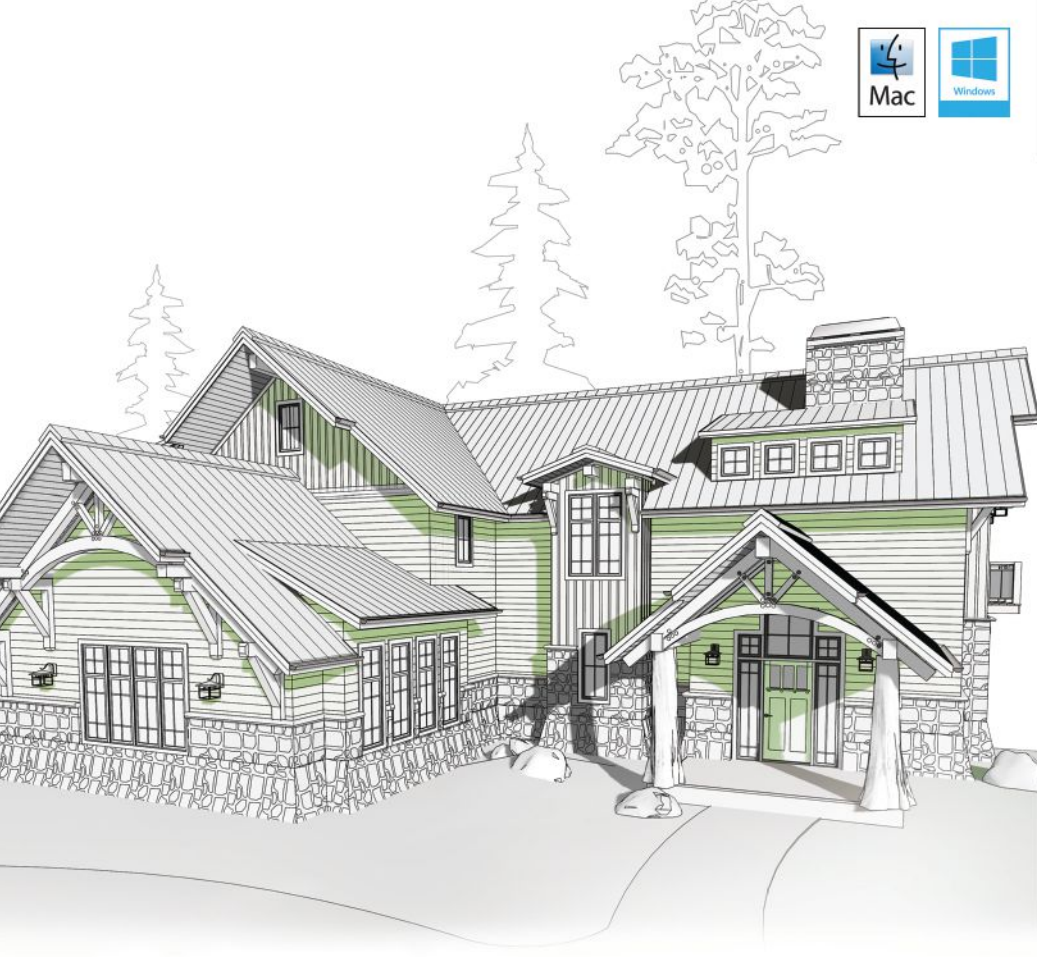
**CLASSIFIED ADVERTISING**

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



# Chief Architect®

Smarter Design Software



## Download a Free Trial Version

- Kitchen, Bath & Interior Design
- 3D Design, Floor Plans & Elevations
- Home Design & Remodeling
- Custom & Manufacturer Catalogs
- Construction Drawings
- CAD Tools & Section Details

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



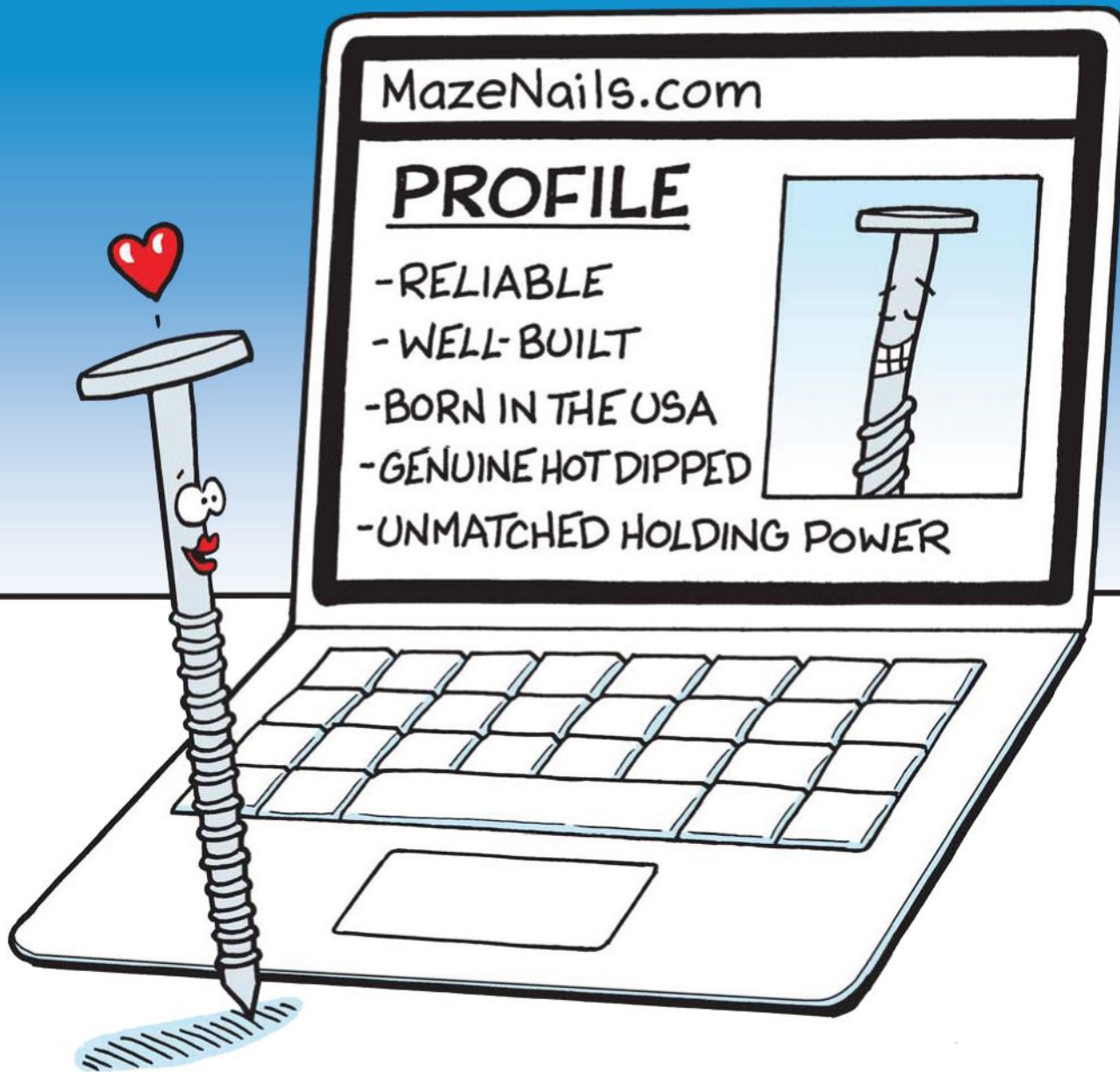
### WE'LL HANDLE THE TECH. YOU BUILD THE DECK.

Get connected at [USPconnectors.com/Decks](http://USPconnectors.com/Decks)  
or call 1-800-328-5934

At MiTek, we offer customers like you a complete line of code-approved, professionally engineered products. And our exclusive Gold Coat™ is a multi-layer system that protects the integrity of the structural connector by offering two layers of corrosion resistance. So when you finish the job, you'll breathe easy knowing you built a deck the right way and with reliable products you can trust. It's one more way we provide better technology for better building.



© 2015 MiTek, All Rights Reserved.



**CALL US FOR MORE  
INFORMATION AND  
WE'LL FIND YOU  
THE PERFECT MATCH!  
800-435-5949**

## Reader Feedback

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

JLCONLINE.COM

# Letters

### **“TOUGHER ENERGY CODES PROMPT ‘ADVANCED FRAMING’ SWITCH,” BY TED CUSHMAN (ONLINE, 9/11/15)**

**Todd Collins (online, 9/13/15):** It is unfortunate that code is the driver for advanced framing and higher energy efficiency. There are a number of reasons for improving the envelope:

- The house will be more comfortable. Cold spaces will largely go away, assuming good design and attention to detail when air-sealing is done.
- Better envelope assemblies assume better airtightness. We should be aiming for less than or equal to 1.0 ACH50.
- Better indoor air quality. Assuming the lower air infiltration, we always use an HRV or ERV with high recovery numbers. With better ventilation comes better IAQ.
- Higher energy prices are almost guaranteed, so there is a price risk that is mitigated. This is especially important for retirees or soon-to-be retirees who are or will be on a fixed income.
- Reduced cold-house risk. Better envelopes make the home more comfortable and mitigate the risk of having to make more improvements.

As an industry, residential builders need to do better; code needs to drive it overall.

**Daniel R. Jenkins (online, 9/13/15):** There are other reasons for advanced framing besides energy efficiency. While I am a general contractor, at my own home there are train tracks about 1,000 feet from the south-facing master bedroom. I built a double wall with 2x6s on 24-inch centers inside on a staggered layout with 2x4 studs on 24-inch centers outside. This design greatly reduces sound bridging as well as thermal bridging. The king studs at the window and the corners were the only areas where sound and thermal energy could travel through the wall. With a double wall, the amount of wood does increase, as does the labor, but these increases were minimal compared with the results. The next step was to install a Milgard window with sound-deadening capabilities. Standing in the room as a train passes, you can feel it, but you can't hear it.

### **“ALABAMA BUILDERS PUSH BACK ON ARC-FAULT REQUIREMENT,” BY TED CUSHMAN (ONLINE, 9/8/15)**

**Jack Rose (online, 9/8/15):** As a licensed master electrician, I am as pro-safety as they come. However, these devices [arc-fault circuit interrupters (AFCIs)]

are very expensive, and my critical-thinking skills always instruct me to follow the money. The concept of stupid-proofing life from the cradle to the grave is unattainable! Where are most of these devices manufactured? Who gets the banker's share of the profit when they are sold? Who has a vested interest in lobbying the NFPA to require them?

While I can certainly sympathize with Charlie Donaghe's accident and subsequent plight, what was the condition of the extension cord that was being used in his residence? What would his reaction have been if an AFCI had been protecting the circuit that he was using? Would he have attempted to reset the device? Or would he have used another circuit, one that was not AFCI-protected? There are many more questions than answers.

I believe that if safety were the primary objective for requiring these devices in residential applications, the cost would be closer to that of a GFCI. Rather than AFCIs being a requirement for new homes, the decision should be left to homeowners after the pros and cons are explained to them. The homeowner could then make an informed decision as to whether to have them installed or not.

### **“ULTIMATE ELECTRIC HOT WATER HEATER SETUP,” BY MATT RISINGER (ONLINE, 8/21/15)**

**Tripp Pankey (online, 8/23/15):** I like to do the same type of setup, except I install the storage tank on the other side of the house, close to the users so there's less wait: typically the HP [heat pump] close to the kitchen and the storage close to the master. This means the kitchen won't have the full capacity of both tanks, but that's OK.

In a spray-foam house, I like to put the HP tank in the encapsulated attic *if* the attic is big enough and has enough volume to support the HP. I am in a cooling-dominated climate. However, heat rises and the attic stays warm enough during the winter.

**MattRisinger (online, 8/24/15):** Very cool idea! I'm a big fan of Gary Klein's hot-water research (see “Efficient Hot Water Piping,” Mar/13), so I used a trunk-branch method to run the plumbing. The master bath is the furthest fixture, so we have a Metlund D'Mand pump (gothotwater.com) down there. Clients hit a doorbell button on the vanity to circulate the pump, which has a thermocouple and shuts off when it senses hot water. I like your idea, however, and might try to make that work in a future build.



Where entertaining is pure entertainment.

Where there is never a “last call.”

Where friends inevitably spill (their best stories and the remainder of their drink).

**THE PERFECT PAIRING:**  
QUARTZ GALILEO (Q3011)  
LAMINATE WHITE CYPRESS (7976K) & SKYLINE WALNUT (7964K)

EXPLORE NEW SURFACES | [wilsonart.com/quartz](https://wilsonart.com/quartz)

 **Wilsonart**<sup>®</sup>

**Q** I'm setting up a small woodworking shop and want to have places to plug in pneumatic tools at various places around the shop. What is the best piping to use for compressed air and do I need to worry about condensation?

**A** Greg Burnet, a window and siding contractor based in Chicago and a presenter at JLC Live, responds: There are a number of options for piping compressed air. Some of the more frequently used materials are copper, black iron (or galvanized) pipe, stainless steel, PVC, and cross-linked polyethylene, more commonly known as PEX.

Systems piped with rigid metal offer resistance against accidental impact or puncture, but they are generally the most laborious and expensive to install. Of the metals, stainless steel and copper pipe and fittings are the priciest, and they're most often used in larger commercial and industrial settings where permanence and durability are required. Special skills and equipment are required for handling these materials, so they're often installed by plumbers or pipefitters.

A more economical material for a rigid-pipe air system is either galvanized or black iron pipe. But with all the fittings, couplings, lengths of pipe, and so on, installation can be complex and lengthy. Unless you have access to a pipe threader and dies, you will probably need to have some of the pipe cut and threaded by someone else. And because there are so many joints with this material, the potential for a leak is greater.

PVC seems to be popular for small shops. It's inexpensive and fairly easy to install, and working with it doesn't require any special tools. But if you decide to go this route, it's critical to understand that not all PVC pipe and fittings are rated for use in this type of application. Most PVC pipe that's sold for plumbing (DWV) has a stamp on its side that reads "Not For Pressure." Using PVC that is not pressure-rated for compressed air lines could lead to serious injury or damage if those lines were to burst. So be sure to specify PVC pipe and fittings that are designed to be used in compressed-air systems. A good plumbing supply house shouldn't have any trouble getting you such products.

Another option is heavy rubber air hose, which comes in 100-foot rolls. It's flexible and connects with nipples and hose clamps available at most hardware stores.

My personal preference for small-shop compressed-air



In-line pressure regulators are a convenient accessory for tools that require less pressure than the compressor provides.

piping is PEX. It's lightweight and flexible, and the fittings literally snap together. It's the easiest of any of the options to reconfigure and the simplest to install. Because of its flexibility, you can often place PEX where it would be difficult to install rigid pipe, such as in finished walls and ceilings. PEX requires special fittings that may not be available at a home center or hardware store, so it's best to map out your install ahead of time and order a few extra fittings. PEX pipe and fittings can be purchased online, and several companies, such as Rapid Air and Compressed Air Systems, offer packaged kits.

As far as condensation is concerned, it's always wise to install condensation filters in a piped system, for several reasons. If you're planning to use compressed air to spray finishes, it's difficult to achieve a blemish-free finish if there is any water in the supplied air. Also, pneumatic tools work best and last longer when clean, dry air is used. Finally, moist air can contribute to rust and corrosion in both the compressor and any ferrous metal components in a piped system. Remember to drain the compressor and any in-line filters on a regular basis.

**Q** For securing oak strip flooring, how does hand-nailing compare to using a pneumatic tool? Is one method better than the other?

**A** Howard Brickman, a wood-flooring contractor and consultant in Norwell, Mass., responds: All wood flooring was installed by hand using a hammer and nails until 1946, when the Anstett brothers perfected the manual nailing machine and started the Powernail Company in Chicago. These power nailers drove L-shaped barbed cleats using a 4-pound mallet with a rubber striking face. This innovation occurred just in time to increase wood-floor installation productivity in the post-World War II housing boom. As pneumatic nailing technology was adapted to the home-building industry in the 1970s,

Bostitch (bostitch.com) developed the first practical pneumatic stapler for wood-floor installation. There are advantages and disadvantages to all the different methods of driving fasteners.

Driving individual nails with a hammer (the old-fashioned way) is a simple but time-consuming method of fastening when you're starting and finishing a floor up against a wall, where nailing machines cannot be used. Hand-driven nails are prone to bending, but that can be minimized or eliminated by either pre-drilling or using a nail spinner (made by Vermont American).

Most professional installers use pneu-

matic finish nailers to face-nail boards at the start and finish of the flooring installation. The primary disadvantage of pneumatic finish nails is their reduced strength and stiffness.

Once you are about 5 inches out from the starting wall, you can begin using the more productive nailing machines. But as you approach the end wall, you again run out of space and generally cannot use the nailing machine within 8 inches of the wall.

With manual nailing machines, you supply the force necessary to drive the nails with muscle power, by swinging a heavy hammer. Pneumatic machines require much less physical prowess; however, you must carefully adjust the compressor pressure so that fasteners are driven flush with the tongue without damaging it. Pneumatic machines also require a compressor, which needs electricity with sufficient capacity to keep up with the fast-paced installation.



**Wolmanized® Outdoor® Wood  
with BARamine® Technology  
raises the bar for  
wood protection**

**BARamine® Technology offers:**

- Brighter, cleaner look
- Protection against broader spectrum of copper-tolerant fungi
- Improved preservative penetration
- Superior mold protection
- Patent-pending advanced technology



**Home Innovation**  
NGBS GREEN CERTIFIED™  
HomeInnovation.com/Green



find it on [ecospecifier.com](http://ecospecifier.com)

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

You really can have your cake and eat it too!

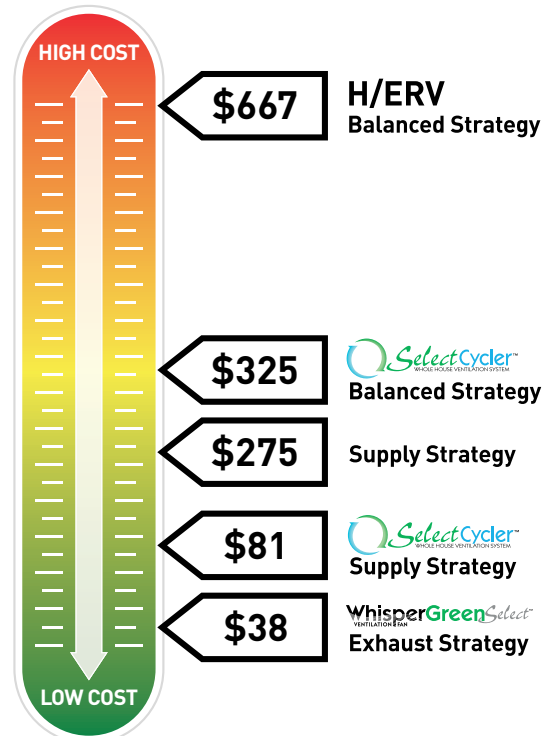
**HIGH PERFORMANCE**  
*and* **LOW COST!**



No matter what ventilation strategy you select, Panasonic has the lowest cost solution available.



**Ventilation Cost Per HERS Point Index**



Panasonic offers the most cost effective ventilation solutions for meeting code and lowering your HERS® Index score.

To learn more about Panasonic's high performance, low cost ventilation solutions visit [us.panasonic.com/ventfans](http://us.panasonic.com/ventfans)

\*Modeling conducted by EPX/NRLogic

# HAND- HOLDING WORKS WITH YOUR KID. NOT YOUR SUPPLIER.

© 2015 Pella Corporation

You run a business, not a classroom. You don't have time to school your window and door supplier. Your customers expect you to show up when you say you will, so choose a supplier who will do the same. Pella works hard to provide you on-time and accurate deliveries every day – hands down.

Isn't it time you traded up to Pella?

[Pella.com/JLC](http://Pella.com/JLC) | 877. 717.3552

**WE GOT THIS.**



BY TED CUSHMAN



## Air-Sealing a Chimney Chase

**Portland, Maine-based Upright Frameworks** is one of New England's most successful home-performance contractors. A jump-start from the federal stimulus package in 2009 helped the company get on its feet; now, a steady stream of referrals keeps the weatherizing work coming, along with major remodeling and new-construction jobs. In July, *JLC* stopped by an Upright Frameworks weatherizing job in Durham, Maine, to follow the action on site.

The job was a classic home-performance repair: The existing roof had been constructed without an effective air barrier between the occupied second floor and the roof above. Warm, moist air escaping into the unvented roof from below had made the house expensive to heat and was also damaging the roof. The low-pitched, almost flat roof structure made access to the space difficult. But in any case, the Advantech roof sheathing, although only

about 10 years old, was covered in mildew and showing signs of moisture damage. So the customer elected to remove the roof sheathing and replace it—which provided easier access for the crew to carefully air-seal the second-story ceiling and to install a combination of dense-blown and loose-fill cellulose in the roof. At the same time, the crew would install new roof vents.

With the roof off, Upright Frameworks weatherizing tech Scott Phillips took advantage of the situation to air-seal the brick chimney chase from above. Phillips started by air-sealing the joints in the existing framing, using gun foam (1). Then he measured the opening around the chimney (2) and installed metal flashing to cover the 2-inch gap.

Using a pair of Cutco metal shears, Phillips cut pieces of flashing to span the opening (3). The shears, which retail for around \$110, are Phillips' tool of choice for

Photos by Ted Cushman

metal work: “I can snip a penny in half with these,” he said.

Whether for a wood stove, a fireplace, or an oil or a gas furnace or boiler, brick chimneys are usually installed with 2 inches of clearance between the masonry and the wood framing of the ceiling or roof. In some Maine jurisdictions, authorities allow the use of rock-wool insulation in the gap around masonry chimneys. But for this job, local officials would only permit the metal air barrier.

The Upright Frameworks crews carry unpainted sheet-metal material on their trucks for this kind of work. But in this case, Phillips used coated aluminum coil flashing left over from another project. The only requirement, company owner Josh Wojcik explains, is that the material be noncombustible (in other words, metal).

After cutting flashing to the required length and width for one side of the chimney, Phillips snipped off the corners at two ends to leave space for existing TV coaxial cable that had been routed through the chimney chase into the attic from below. To avoid damaging the coax cable’s plastic insulation, he folded small scraps of flashing over the sharp edges at the cuts **(4)**.

Working his way around the chimney, Phillips maneuvered the strips of flashing into the small gaps between the wood and the masonry, operating as much by feel as by sight **(5)**. Once he was sure of a good fit, he applied high-temperature sealant to the underside of each metal piece **(6)**. When the metal was screwed down, the caulking would seal and reinforce the connection, blocking the flow of air at the joint where the metal lay on top of the ceiling framing.

To secure the metal flashing in place, Phillips screwed the pieces down onto the ceiling framing **(7)**. Finally, he sealed the joint between the metal and the chimney with high-temperature caulk **(8)**.

It was tricky work at close quarters, but, Phillips said, easier than the more common problem of sealing that juncture from inside the house. Better still, of course, would be to air-seal this obvious leakage point when you first construct the house—and at the same time, air-seal the rest of the ceiling too.

*Ted Cushman is a senior editor at JLC.*



# IMAGINE PERFORMING

## TAKEOFFS 70% FASTER



No matter how big or small the project, Bluebeam® Revu® equips you with digital takeoff tools to quickly generate professional PDF bids that stand out from the competition. Easily take length, area, perimeter, diameter, volume and radius measurements. Search for objects and automatically generate an inventory count from your results. Revu even tracks all measurements in a flexible, exportable list that supports custom columns and formulas to calculate material costs as you go. What are you waiting for?

Imagine the possibilities  
[bluebeam.com/flexible](http://bluebeam.com/flexible)





## Refinishing a Hail-Damaged Home

BY SCOTT BURT

**A year ago, I was called in** to assess damage done to a home's exterior walls during a severe thunderstorm. Large hailstones had pelted the siding on three of four walls, with the front, northwest facade taking the brunt of the storm. The existing siding and trim had been finished with Sikkens—an alkyd-based stain that, when dry, produces a hard, glossy film—and on the facade that was spared the hail, and in protected areas such as under roof overhangs, the Sikkens was undamaged and still well-bonded. (Though in a few exposed, sunny areas, the finish had begun to peel before the storm.)

On close inspection, I realized that the damage looked far worse than it was. Much like a rock hitting a windshield, the hail had essentially “shattered” the Sikkens film coating on impact, resulting in a pockmarked surface—but the compression wounds left by the hail pene-

trated only  $\frac{1}{32}$  inch, leaving the underlying red-cedar siding relatively untouched. Still, the finish was beyond repair and needed to be replaced.

### SURFACE PREPARATION

Sikkens can be removed chemically or mechanically (by sanding). Both methods are messy and time-consuming, but sanding is the better option because stripping vertical surfaces with caustic liquids is an exposure risk and can damage window cladding and gardens below. Starting at the bottom of the front facade, my business partner, Todd Pudvar, and I inspected every clapboard on the house, determining on the fly whether to remove the Sikkens down to bare wood or to scuff-sand it to induce bonding of the new finish.

Using Festool Rotex RO 125 sanders attached to

Photos by Scott Burt

# SECURITY, MEET SIMPLICITY.



LET'S DO THIS.™



## PRO

More saving. More doing.®

## Kwikset

### KWIKSET® SMARTKEY® DOOR LOCKS



RE-KEY IN 15 SECONDS  
OR LESS

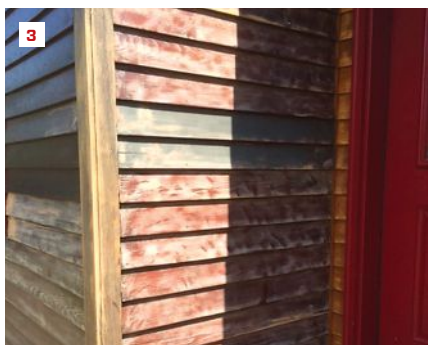


INSTALL IN MINUTES  
WITH A SCREWDRIVER



PROFESSIONAL GRADE,  
SUPERIOR BUMP/PICK  
RESISTANCE





Festool CT Midi HEPA Dust Extractors, we worked our way up toward the soffit (1), sanding off most of the finish (2). The pitting was random in intensity and location, and a small return wall adjacent to the front facade needed only to be scuff-sanded (3).

Sanding down to raw wood eliminated 95% of the pitting (4); in the few spots where bigger stones hit the siding just right, we spent a little more time sanding out the deeper dings in the wood grain. Where the clapboards met corner boards and trim, we sealed the gaps using a brown-colored acrylic latex/silicone caulk by DAP.

#### PRIMER COAT

Our clients still wanted a dark brown finish on the home but didn't want to use Sikkens or any other transparent stain. We agreed that it would be best to put some "body" in the finish and suggested using a deep-base acrylic primer, which we could tint to match a dark acrylic finish coat. The tinted primer afforded some coverage assistance, allowing us to apply just one coat of final finish.

The primer coat is the most important for longevity, because it's the layer moving with the wood. We only use Sherwin Williams'

Multi-Purpose Latex Primer/Sealer primer, a high-adhesion primer that helps hide imperfections from the surface prep (5)—in this case, the occasional sanded-down deep pockmark and swirl marks left from scuff-sanding. Working from the top down, we applied it by brush rather than spraying it; the brush mechanically puts the primer into the grain of the wood for better adhesion. We like using 2 1/2-inch Purdy XL medium/stiff angled brushes for both the primer and top coats, which we applied liberally and fast to keep them wet. This size of brush works well in clapboard reveals to spread paint in long passes while still allowing us to point and cut where needed.

#### FINISH COAT

Applying deep-colored paint with a high LRV factor is a double-edged sword. The darker it is, the more pigment it has and the more protection it offers. But dark colors also cause the wood siding to heat up and expand and contract more (they also inherently tend to fade more over time than lighter colors).


We used Sherwin Williams' Duration Satin on the trim and Sherwin Williams' Woodscapes on the siding. Woodscapes is a solid stain with a flatter finish and would help hide any cosmetic defects left over from removing the Sikkens. We applied the top coat as we did the primer, generously and continuously to keep it wet. Todd and I worked quickly to keep material flowing in the hot summer sun, applying it in sections that we could cover alone (between windows) or working together on sections where we needed to blend longer runs into each other without flashing (6).

A surface restoration project like this costs much more than a straight-up exterior repaint (about twice as much), but still costs significantly less than a siding replacement. It was the appropriate option, because despite the predominantly failed Sikkens coating, the cedar siding underneath still had a lot of life left in it. We expect the finish system that we installed to be sound for many years, with light finish maintenance in high-exposure areas recommended by the third year.

Scott Burt owns Topcoat Finishes, in Jericho, Vt.



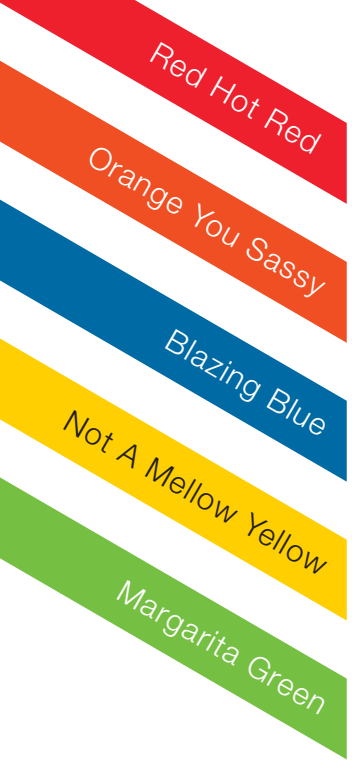
Meet new code  
in minutes.



Simplify how you attach a deck to a house with the new DTT1Z deck tension tie. It's a safe and time-saving alternative that eliminates the need to access floor joists from inside the house. Designed to meet new 2015 IRC code provisions, the DTT1Z is fastened from the outside of the house, connecting the deck joists to the home's framing. The deck tension tie installs on the joist with Strong-Drive® SD Connector screws and into the house with the new Strong-Drive® SDWH Timber-Hex HDG screw.

Learn more about the DTT1Z deck tension tie by calling (800) 999-5099 and download the product flier from [strongtie.com/dtt1z](http://strongtie.com/dtt1z).

**SIMPSON**  
**Strong-Tie**



# Express Yourself

Explore our five bold new colors for endless creative possibilities. DesignRail® aluminum railing systems are customizable and pre-engineered with 6000-series aluminum and an AAMA-2604 powder-coated finish to be ultra-durable, easy to install, and low maintenance.

To learn more, speak with your Feeney dealer or visit [www.feeney5.com](http://www.feeney5.com) or call us at **1-800-888-2418**



feeney® *makes it easy*

BY MELANIE HODGDON

## Three Ways to Price Yourself Out of Business

**As a construction industry consultant**, I'm frequently asked, "What number should I use to mark up my costs?" The simple answer is "Whatever will cover your overhead and provide the target profit you want."

### MISTAKE #1: CONFUSING MARKUP AND MARGIN

A common mistake is to look at total overhead for a given period (say 12 months) and express it as a percentage of total sales for that period. For example **(1)**, here's a company with \$800,000 in sales, less production and overhead costs. Dividing each amount by the total sales figure gives us the results shown in the right-hand column.

#### 1. Overhead as a Percentage of Total Sales

<b>Income</b>	\$800,000	100%
<b>Cost of Goods Sold</b>	\$575,000	71.88%
<b>Gross Profit</b>	\$225,000	28.13%
<b>Overhead</b>	200,000	25.00%
<b>Net Profit</b>	25,000	3.13%

#### 2. Sales Price as a Percentage of Estimated Costs

<b>Total Estimated Costs</b>	\$575,000
<b>Add 25% for Overhead</b>	\$143,750
<b>Add 3.13% for Profit</b>	\$17,998
<b>Calculated Sales Price</b>	\$736,748

Starting with the 100% figure for sales, this company is losing 71.88% (or \$.7188 on a dollar) to produce the work, and another 25% (or \$.25 on a dollar) for overhead, leaving 3.13% (or \$.0313 on a dollar) profit. Many contractors look at that and say, "OK, I need to take my costs and add 25% for overhead." If they're happy with the amount of profit they made in the past, they would probably try to perpetuate the strategy by adding another 3.13% for profit.

Let's imagine, then, that the contractor by sheer coincidence happens to sell a single big job and he estimates the costs will be exactly \$575,000 **(2)**. Let's see what happens when he adds the 25% + 3.13% to the estimated costs. He should end up with a sale price of \$800,000. What happened?

Remember that in the original Profit and Loss, all the line numbers (Cost of Goods Sold, Gross Profit, Overhead, Net Profit) were compared with *total sales*. Later, when our contractor was trying to price a new job, he added 25% and 3.13% based on the *estimated costs* of the job. Our contractor confused markup with margin. The terms are easily confused (they even sound similar), but markup always compares against costs, while margin is compared against selling price.

### MISTAKE # 2: USING MULTIPLE MARKUPS WITHOUT BLENDING COSTS

Contractors, particularly those who sell T&M work and are put in a position of explaining (or too often, justifying) their pricing to customers, frequently grapple with how to mark up different types of costs. For example, I often hear from contractors that "the subcontractor is doing all the work, so it doesn't seem fair to add much of a markup on top of that." Or, "I can justify marking up the little stuff like lumber and fasteners by 40% to 50%, but when it comes to \$50,000 worth of cabinets, how can I possibly keep the same markup?"

The truth is that no matter how you arrive at the selling price of a job (or how much you add to individual line items in a T&M invoice), if you don't sell the work for the correct markup for your company, you will not thrive and grow; you may not even survive. That said, there are many ways to arrive at that magic sales price (for a contract price job) or markup (for T&M work).

The first thing to understand is that unless you apply a uniform markup to all calculated costs consistently,

you will need to blend, or mix, costs. Take, for example, a contractor who has identified his burdened hourly cost for field labor. He is selling a contract price job by applying a 50% markup to all costs. Notice that no matter what percentage of the job cost is for labor, materials, or subs, the selling price remains the same **(3)**.

But let's say that the contractor prefers to apply variable markups to the different cost categories. Let's say that he puts a 100% markup on labor and a 25% markup on subs and materials **(4)**. (These are the markups required in order to match the \$150,000 selling price arrived at by applying a uniform markup to all costs.) How will varying percentages of these costs affect the selling

price? Depending on the type of job, the sales price changes. (Next month I'll go into greater detail about how to blend markup to make this work.)

**MISTAKE #3: MISUNDERSTANDING 'BREAK EVEN'**

I haven't yet met a contractor who didn't admit to selling a job at a price that he knew was too low. There's always a rationalization: "I had to take it to keep the guys working" or "the job was right on Main Street; it was like free advertising" or "I made a ton of money on the last job and this one had some interesting challenges."

The misunderstanding occurs when contractors assume that "break even" refers to

charging enough for the job to cover the actual costs of the job. The logic error here is to forget that the sale price must cover not just the job costs, but also overhead, with enough left over to contribute to profit.

Let's look at five identical "good" jobs, where "good" means that there was adequate gross profit to cover that job's share of company overhead and contribute to total profit.

What happens when a job "breaks even"? If you think that "break even" means that costs equal sale price, you do not break even, you're actually in the hole by \$2,500 **(5)**. That's because overhead costs keep coming in regardless of how you've priced your job.

True "break even" refers to a price that covers both the production costs and that

**3. Uniform Markup**

**Equal Distribution of Costs**

Cost Type	Est. Cost	% of Total Costs	Markup	Sale Price
Labor	\$33,333	33.33%	50%	\$50,000
Materials	\$33,333	33.33%	50%	\$50,000
Subs	\$33,333	33.33%	50%	\$50,000
Totals	\$100,000	100.00%		\$150,000

**Labor-Heavy Job**

Cost Type	Est. Cost	% of Total Costs	Markup	Sale Price
Labor	\$65,000	65.00%	50%	\$97,500
Materials	\$25,000	25.00%	50%	\$37,500
Subs	\$10,000	10.00%	50%	\$15,000
Totals	\$100,000	100.00%		\$150,000

**Material- and Sub-Heavy Job**

Cost Type	Est. Cost	% of Total Costs	Markup	Sale Price
Labor	\$10,000	10.00%	50%	\$15,000
Materials	\$45,000	45.00%	50%	\$67,500
Subs	\$45,000	45.00%	50%	\$67,500
Totals	\$100,000	100.00%		\$150,000

**4. Variable Markup**

**Equal Distribution of Costs**

Cost Type	Est. Cost	% of Total Costs	Markup	Sale Price
Labor	\$33,333	33.33%	100%	\$66,666
Materials	\$33,333	33.33%	25%	\$41,666
Subs	\$33,333	33.33%	25%	\$41,666
Totals	\$100,000	100.00%		\$150,000

**Labor-Heavy Job**

Cost Type	Est. Cost	% of Total Costs	Markup	Sale Price
Labor	\$65,000	65.00%	100%	\$130,000
Materials	\$25,000	25.00%	25%	\$31,250
Subs	\$10,000	10.00%	25%	\$12,500
Totals	\$100,000	100.00%		\$173,750

**Material- and Sub-Heavy Job**

Cost Type	Est. Cost	% of Total Costs	Markup	Sale Price
Labor	\$10,000	10.00%	100%	\$20,000
Materials	\$45,000	45.00%	25%	\$56,250
Subs	\$45,000	45.00%	25%	\$56,250
Totals	\$100,000	100.00%		\$132,500



STRONG



LIGHTWEIGHT



STABLE

## Stands Up To Even Your Toughest Customers

New-to-the-world DecKorators® Vault decking delivers the industry's best strength-to-weight ratio. The fibrous interior — made with patented Eovations™ technology — maintains stability season after season. What's inside makes the difference, and DecKorators Vault has locked up the ability to take a pounding and still look extraordinary.

Visit [DecKorators.com/GoBeyondOrdinary](https://www.DecKorators.com/GoBeyondOrdinary) to learn more.

**5. “Break Even” Is Not Income = COGS**

	One Good Job	Five Good Jobs	Add One Bad Job	Total Six Jobs
<b>Income</b>	\$50,000	\$250,000	\$50,000	\$300,000
<b>COGS</b>	\$32,500	\$162,500	\$50,000	\$212,500
<b>Gross Profit</b>	\$17,500	\$87,500	\$0	\$87,500
<b>Overhead</b>	\$15,000	\$75,000	\$15,000	\$90,000
<b>Net Profit</b>	\$2,500	\$12,500	-\$15,000	-\$2,500

job’s fair share of company overhead. There is nothing left to contribute to profit, but at least overhead is covered (6).

**CONCLUSIONS**

There are only three ways to increase your true bottom line (profit):

1. Reduce your overhead so gross profit

dollars go further and, after covering overhead, “fall into” your net profit.

2. Reduce production costs by sticking to your schedule, cutting back on waste, and improving efficiency through increased oversight, training, and accountability.

3. Raise your prices. This has zero impact on the production process or what you

**6. “Break Even” Is Income = COGS + Overhead**

	One Good Job	Five Good Jobs	Add One Bad Job	Total Six Jobs
<b>Income</b>	\$50,000	\$250,000	\$50,000	\$300,000
<b>COGS</b>	\$32,500	\$162,500	\$35,000	\$197,500
<b>Gross Profit</b>	\$17,500	\$87,500	\$15,000	\$102,500
<b>Overhead</b>	\$15,000	\$75,000	\$15,000	\$90,000
<b>Net Profit</b>	\$2,500	\$12,500	\$0	\$12,500

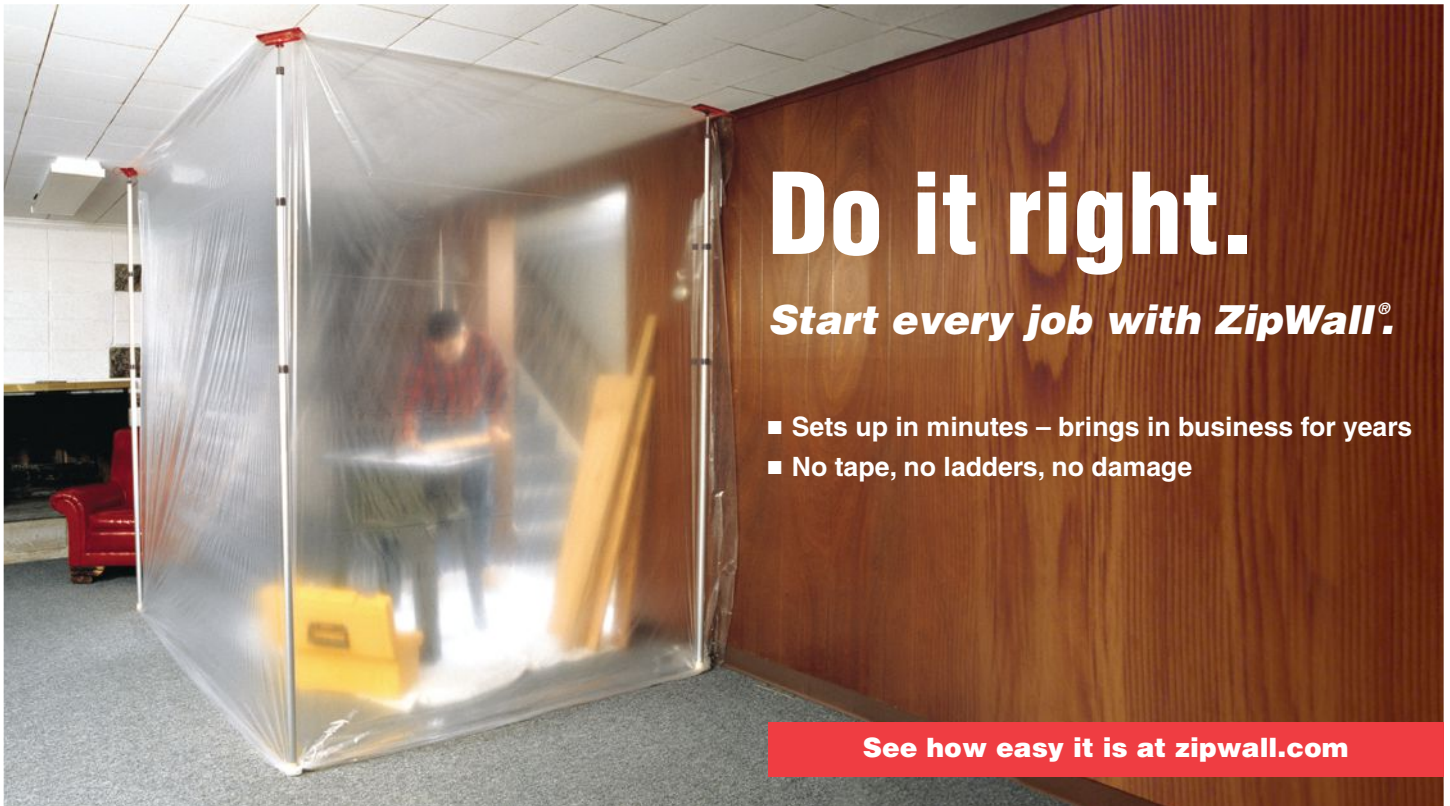
spend on overhead or production costs. Any dollars that you add to the selling price will, under most conditions, fall directly to your net profit.

*Melanie Hodgdon is owner of Business Systems Management and regularly speaks on business topics at JLC Live. melaniehodgdon.com*



**DUST BARRIER SYSTEM**

800-718-2255



**Do it right.**

**Start every job with ZipWall®.**

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

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

# THE WORK TRUCK SHOW<sup>®</sup>

2 0 1 6

We know your challenges.  
We know your business.

**GreenTruck**  
SUMMIT

*The Future of Clean Commercial Vehicles*

March 1-4, 2016  
Educational sessions  
begin March 1

Indianapolis, IN  
[worktruckshow.com](http://worktruckshow.com)



## GET YOUR ANSWERS

- Maximizing return on equipment dollars
- Strategies to enhance fleet productivity
- Controlling fuel and operating costs
- Current market and equipment trends

Brought to you by

**NTEA**  
THE ASSOCIATION FOR THE WORK TRUCK INDUSTRY



# PROBLEM:

UNSEALED EDGES ABSORB  
DIRT AND DUST.



# SOLUTION:

TRUEDGE® IS SHARPER,  
CLEANER AND MORE  
DIRT-RESISTANT.



Kleer PVC Trimboard with **TRUEDGE®**. The best sealed edge anywhere.

TruEDGE® from Kleer doesn't just look like a superior product, **it is a superior product.**

With a **truly sealed edge** that **resists staining from dust and dirt** and **cleans easier** if it does get dirty, TruEDGE is specifically formulated to **keep the edges cleaner longer.**

So your finished product looks—and performs—beyond your expectations.

See how Kleer continues to **think beyond wood** at [KleerLumber.com](http://KleerLumber.com)

**KLEER**  
TRIMBOARD  
+ PLUS

A DIVISION OF THE TAPCO GROUP

BY DOUG HORGAN



## Draining Low-Slope Roofs

**On many of the homes** we work on, at least one area of the roof is “flat.” Of course, no roof is supposed to be completely flat. By code, a roof must be sloped at least  $\frac{1}{4}$  inch per foot of run. In our remodeling work, however, we frequently run into existing roofs that are not sloped well.

In one recent case, not only were parts of the roof dead flat, but it had only tiny, 5-inch-by-5-inch scuppers through the parapet wall (1). (You can't see this parapet roof from anywhere on the property, and there was no functional or design reason to have a parapet wall there, but it was on the original plans.)

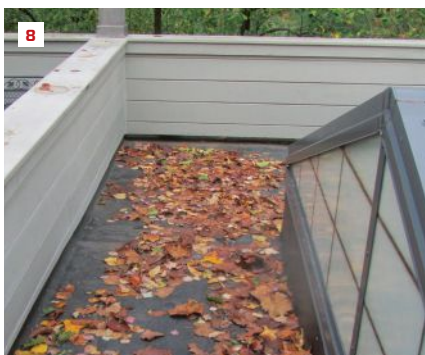
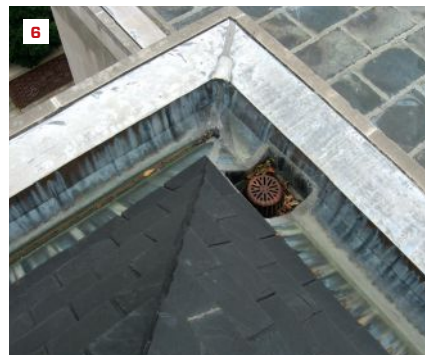
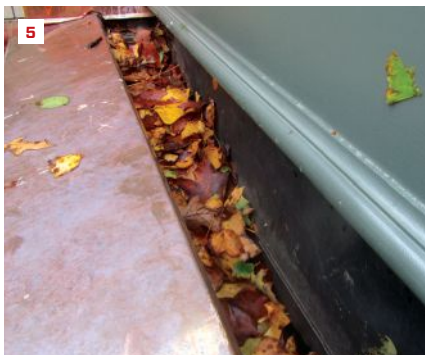
On this roof, the roofing was a single-layer modified bitumen that wasn't maintained well. Because there

wasn't enough slope, water lay on the roof and froze in winter, creating havoc for the seams. There were patches all over it. In fact, this roof was so bad, the roofer had left the bucket of asphalt cement and a trowel up there for the next time he needed to fix it.

This time, we got the call during a rainstorm, and we found about 35 bushels of leaves on the roof, along with 2 inches of water. Once those tiny scuppers filled up with leaves, it was impossible for water to drain off the roof.

### SCUPPERS

When scuppers are flashed-in correctly, they have several layers. Even if the roof is sloped, the scupper



flashing can create a dam that holds water (2). If you're the one sloping the roof, adding pitch here can help the water run off, but we often need to work with what's already there.

To allow for good workmanship and to keep leaves from building up and blocking them, scuppers need to be at least 8 inches tall and about 12 inches wide. It's also critical to mount the receptors as low as possible on the outside of the parapet (3).

When a receptor is mounted above the roof level, you end up with a dam when the receptor fills up with leaves, regardless of how big the scupper is. The receptor needs to be mounted low enough so that when it's full of leaves, water pours out over the top edge instead of backing up across the roof.

#### DRAINS

We see similar problems with drains. Even with a leaf basket over the drain, leaves still collect around its base, creating a dam that prevents water from draining (4). As a

result, a big puddle forms all the way across the roof, which is exactly what you're trying to avoid.

Often, it is not at the roof, however, where a drain fails. We were recently called back to a job when a roof drain backed up. The roof drain assembly was not sealed to the drainpipe below the roofline, which allowed the water to spill out and soak the ceiling below, causing it to collapse. It turned out that landscapers who were working 150 feet away from the house had crushed the drainage pipe.

Not uncommonly, a drainpipe becomes clogged by tree roots, or a pipe is run over, or someone covers the outlet where a pipe drains to daylight. For some reason, landscapers love to cover the end of a pipe, probably because they don't like how it looks.

Another problem is when there isn't a watertight, mechanical seal between the drain unit and the pipe it feeds into. The consequences can be severe.

The proper way to fabricate a drain is to

use a clamp ring assembly, and seal the roof to the top of the drain body. The drain body also must attach to the pipe. That way, if the pipe backs up, water overflows back out onto the roof and not into the building. You can't simply drop a drain body into a drainpipe without a positive seal.

#### BUILT-IN GUTTERS

Built-in gutters are good only at collecting leaves (5). I view them as being a worse version of a drain.

It's difficult to fit a proper drain in a gutter. It can be done, of course, but in a remodeling situation, we are usually stuck with the existing drain locations, and they often are in the wrong place for expansion joints to properly manage thermal expansion of the metal. Even with good workmanship, the metal expands and contracts, and if the movement joints aren't in the right places, the seams eventually rip open and leak.

On one of our jobs, the drain was built into the corner (6), and there was no room

# A NAME YOU TRUST. THE PRECISION YOU NEED.



LET'S DO THIS.™



## PRO

More saving. More doing.®

## THE NEW DEWALT® PNEUMATIC FINISH NAILER



TRUE SIGHT TECHNOLOGY  
FOR PRECISE  
NAIL PLACEMENT



TOOL-FREE  
JAM RELEASE



ONLY AT  
THE HOME DEPOT®



# remodeling

2015  
**COST**  
VS.  
**VALUE**

Looking for resale values on popular remodeling projects in your market?

They are FREE at [costvsvalue.com](http://costvsvalue.com)



### Featuring:

- ▶ 36 Projects in 103 Cities
- ▶ 3-D renderings on project pages
- ▶ Interactive infographics

REMODELING magazine's **Cost vs Value Report** lets you compare construction costs and resale values for 36 popular remodeling projects in 103 U.S. markets. Every national, regional and city report is available online—for **FREE**.



hanleywood

## Troubleshooting / Draining Low-Slope Roofs

for a clamp ring and no room in there to solder. And the drain was positioned exactly where an expansion joint should have been. I don't think there was any good solution for that one—other than putting in another drain, running two stories down through a finished house.

### OPEN EDGE

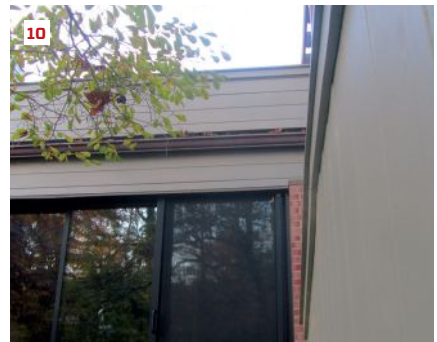
The scupper shown here (7) was an attempt to make a scupper large enough that it would not clog. This one is only about 4 inches tall, however. It took longer to clog than the tiny ones on the house shown previously. But it eventually did after the landscaper—the only one who knew to clean off the leaves from this roof area—was fired. Making it larger—this one was about 4 feet wide—was a step in the right direction, but it wasn't enough. It needed to be either higher or much, much wider.

It is possible to make a completely open edge, but still have a parapet wall. On this example (8), we installed the parapet wall on posts. The wall ends about 4 inches above the roof, providing a continuous space for drainage (9). It's easier to detail—you don't have all the complex origami that flashing in a conventional scupper requires—and it's much harder to clog. You can't really see it from outside (10), because the gutter hides the view of the opening. If you need to have a parapet wall, I think that is the way to do it.

Of course, most houses don't need a parapet wall at all. The main reason to have one is to stop wind from sucking the membrane off a large roof surface. They are often required only on large commercial roofs where high winds can create enormous uplift pressures at the edges of a large roof expanse. Parapets are rarely needed on homes in our area. The roofs are small in the neighborhoods we work in and typically there are many obstacles that slow the wind anyway.

### WHERE DOES THE WATER FLOW?

Once you have enabled a roof to shed water, one last thing you should pay attention to is where all that water is going. You need to ask what will happen if there is a torrential



downpour that sends hundreds of gallons over the roof edge. In our area, it's likely to be a summer thunderstorm that brings down enough leaves to clog the gutters, causing the bulk of that water to spill over the edge. What's below?

You don't want it to be a basement stairwell. Or the French doors leading to the master bedroom, or any door that is boxed in, making it the next low point after the drain. We had a situation like this on one job. What you see in the photo (11) was below a long edge of the roof with nothing in between. We managed to convince the owners to add a small entryway roof that made it possible to get in and out of the basement door without being rained on. More importantly, this new roof deflected any overflow away from the basement area.

*Doug Horgan is vice president of best practices at BOWA, a design/build remodeling company in McLean and Middleburg, Va.*



# CONTRACTOR CONNECTION<sup>®</sup>

## BE PART OF OUR ELITE NETWORK OF CONTRACTORS

Now is your chance to join a group of contractors held to the industry's highest standards. Contractor Connection<sup>®</sup> offers residential and commercial restoration and remodeling programs that provide qualified leads from property insurance carriers and property owners.

### Through your commitment, you can:

- Get Quality Leads
- Build Your Business
- Enhance Your Reputation
- Reach New Levels of Professionalism
- Join 4,800 Top-Notch Contractors

### GENERAL CONTRACTOR AND EMERGENCY SERVICES

Offering restoration and remodeling lead generation | Industry leader in customer service | 4,800 contractors held to the highest standards

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



**Crawford<sup>®</sup>**  
CONTRACTOR  
CONNECTION<sup>®</sup>

# CONTRACTOR REBATE PROGRAM



**CL** KITCHENS  
bath&closets  
Creative Living®

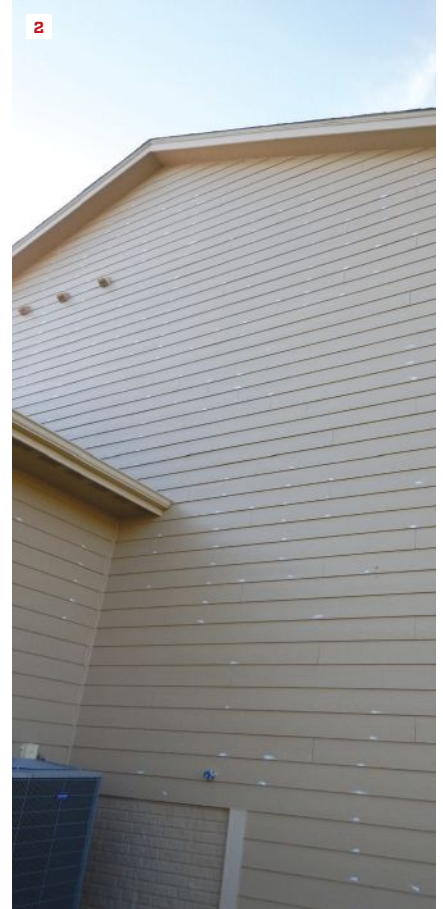


For full program and  
incentive details visit:  
[clkitchens.com/rebate](http://clkitchens.com/rebate)

**Need it Fast?**

We build and ship your order in 10 days or less!

# SIDING



## Common Siding Failures Avoid errors that will cause a fiber-cement job to fail

BY MARK PARLEE

I see a lot of failed siding jobs. The one shown in the photos in this article is typical of the fiber-cement siding jobs I am asked to look at. I could go out right now to hundreds of homes like this one that are in a similar condition. Each one, like this house, usually looks fine from a distance (1), but after examining the house up close, I see the same installation errors again and again. For some of the jobs, I am called out to investigate because they have gone to litigation. For others, it's a homeowner complaint. But almost all of them are very expensive to repair.

On this house, the siding had been so haphazardly nailed on and the fiber-cement boards so poorly attached that wind caused the

siding to vibrate. This vibration transferred through the framing, creating a loud hum when the wind blew that kept the homeowners awake at night. As it turned out, there were problems beyond the inadequate nailing—none of the detailing designed to protect the walls from water had been done correctly. If the siding didn't fall off first, leaks would eventually wreak havoc on the interior.

I didn't think the work could be salvaged, and I recommended tearing off all the siding and starting over. However, since the initial complaint was about the vibration of the loose boards, the builder thought he could fix the job by face-nailing the siding (2). His "fix," along with his attempts to correct the water detailing,

still didn't conform to the specifications of the manufacturer's instructions or those codified in the product's Evaluation Service Report (ESR).

An ESR is required by the building code as acceptance criteria for any fiber-cement siding product. It's an easy document to obtain (search online for "ESR" and the product name). It spells out in plain terms the basic installation requirements for the particular product. This document is the code for that specific material, as stated in the "Conditions of Use" section of every ESR: "The products must be manufactured, identified and installed in accordance with this report, the manufacturer's published installation instructions and the applicable code. In the event of conflict between the manufacturer's published installation instructions and this report, this report governs."

I always download copies of the ESR and the installation instructions and make sure my installers have copies too. The basic requirements for all fiber-cement products are similar, but you can't assume they are the same. There are small differences in the dimensions that define where nails can be placed and what clearances are needed above adjacent surfaces.

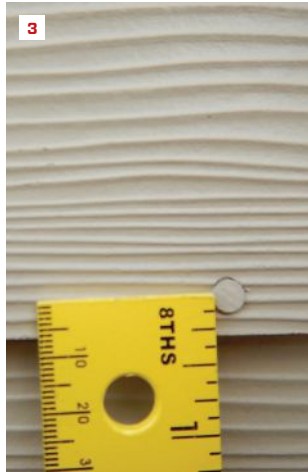
### NAILING ISSUES

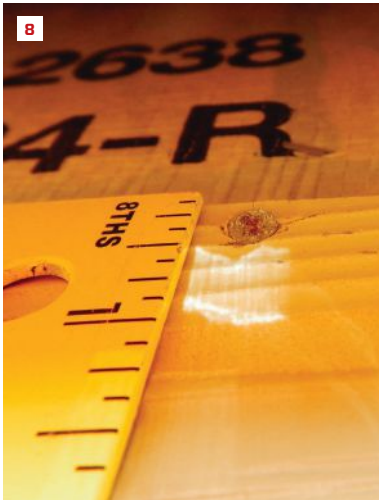
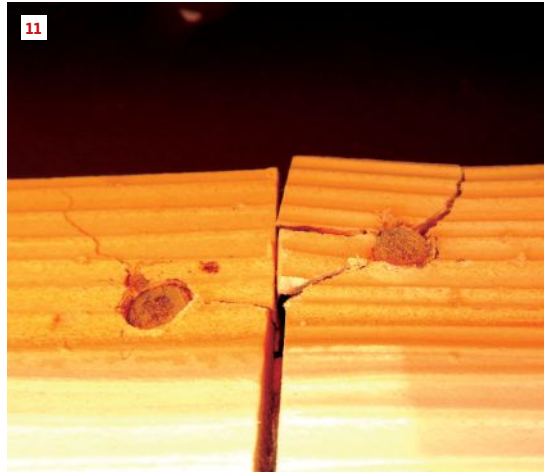
The material used here was MaxTile's MaxiPlank; and according to its ESR, exposed fasteners (face nails) must be placed at least  $\frac{3}{4}$  inch up from the bottom edge. Mostly, this job had been blind-nailed to begin with, but the installers had occasionally placed face nails to hold boards down, and these were only about  $\frac{3}{8}$  inch from the bottom edge (3). At least the nail shown here had been set more or less flush to the surface, whereas all the face nails the builder had retrofit not only were too close to the bottom edge, but also had been overdriven—and the divots had been filled with spackle (4).

In my initial report, I documented a number of other nailing problems. For starters, the ESR is clear about placement for exposed fasteners at butt joints: Butt joints must be located over studs (or a metal plate must be used for butt joints between studs, but none were in evidence on this job), and the nails placed  $\frac{3}{4}$  inch up from the bottom edge and  $\frac{3}{8}$  inch from the ends.

On this job, however, the butt joints were not located over the studs (5). The house was framed on 16-inch centers, while many of the butt joints were offset by 24 inches.

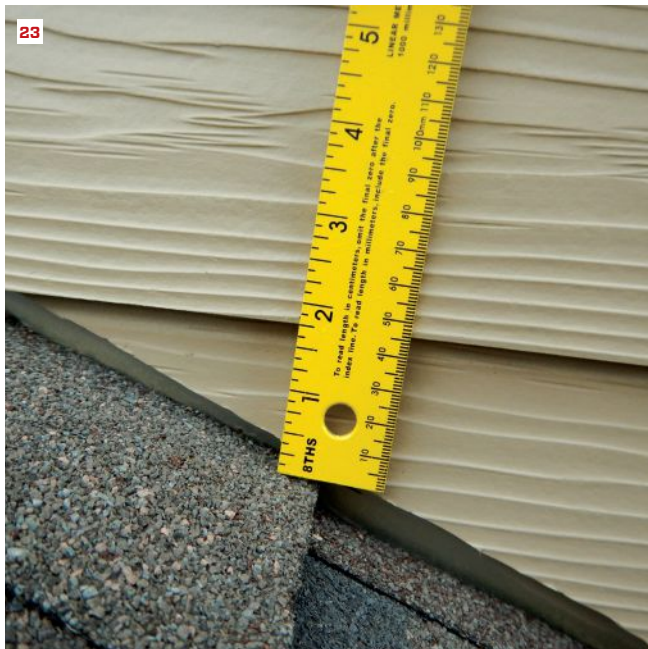
At the butt joints, the builder had initially made an attempt to hold the ends down with a single nail strategically placed to hold both ends (6)—an incorrect detail that I see all the time. I have also seen installers try to pin the ends down (7). Neither solution will provide enough holding power to secure the siding.





# COMMON SIDING FAILURES





For blind nailing, the ESR specifies that fasteners must be placed a minimum of 1 inch down from the top edge of the board, and a minimum of  $\frac{3}{8}$  inch from the ends. My inspection showed that a majority of the nails were much closer to the top edge (8) and many were overdriven (9).

The reason for requiring a minimum distance from board edges and ends is clear: When a fastener is placed too close to an edge, the material tends to break around the fastener (10, 11) when boards expand and contract with changes in temperature, or when wind forces push and pull on the material. The vibration caused by loose boards fluttering in the wind no doubt accelerated this failure and is why so many of the fasteners on this job had completely failed.

Like a lot of the homes in this part of the country, the house had been sheathed with a fiber-board sheathing, which has no nail holding strength. With this material, it is especially important to drive the siding nails into the studs. But that clearly didn't happen. An analysis of the fastener spacing (12) showed that the nailing was fairly random—likely a symptom of a zealous installer firing rapidly across each board with a pneumatic nailer.

### WATER MANAGEMENT DETAILS

There were a number of egregious water-detailing problems too. One of the worst was a siding break made directly above a dryer vent (13). Water leaking through this joint hit the vent pipe and followed it to the interior, where, not surprisingly, we found water marks. At all the other penetrations—at the gas line near the meter (14) and the hose bib (15)—the siding had simply been slotted around the pipe or vent, which not only looks bad, but also leaves the wall open to serious water and air leaks.

The correct way to detail an existing pipe or vent penetration is to use a split mounting block (16). When one of these is used, a hole saw is centered along the split, and half the block is slid over, and the other half under, the pipe or vent. The split, which is beveled so it drains downward, is tightly sealed with caulk.

**Butt joints.** Fiber cement won't rot, but it is not completely impervious to water. It can absorb water at ends and edges, and swell. This not only looks bad initially, but the movement of swelling and drying and freezing and thawing will gradually cause the material to deteriorate at vulnerable edges.

It's critical that board ends butting against window and door openings, or against corner boards, be cut at least  $\frac{1}{8}$  inch short to accommodate expansion. On this job, the boards were frequently butted hard against the trim (17). This left no room for the material to expand,



and it also created an inferior caulk fillet that failed quickly and allowed water to seep into the joint when the siding boards contracted.

**Cut edges.** The installers on this job also failed to prime the cut ends of siding and trim boards, as specified in the manufacturer's instructions to protect the material from water (18). This is particularly important for exposed edges at the base of the wall (19). Water running down the face of the wall can turn under that lower edge, and splash-back will further wet this area.

**Clearances.** All fiber-cement manufacturers specify minimum clearances where siding hits a horizontal surface. This can include horizontal trim, such as above the head trim on an opening, above the mounting block for exterior penetrations, or where the siding lands on the top edge of water table. At least ¼ inch is required, and this gap must be caulked. However, the installers on this job left only about ⅛ inch above and left it uncaulked (20).

The clearance between the siding and a deck, porch, or hardscape surface, or along the rake of a roof, is much greater. For MaxiPlank, this clearance is supposed to be at least 1 inch to 2 inches. (But Hardie, for example, requires at least 2 inches in our climate zone. Don't

assume all fiber-cement details are the same.) On this job, the installers brought the siding right down to the porch floor (21) and to the sidewalks (22).

**Sidewalls.** The installers also brought the siding down onto the roof surface where sidewalls intersected a roof (23). And they left out any kind of kick-out flashing where the bottom edge intersected with the wall (24). When this was called out on my initial report, they cut back the siding and smeared a lot of caulk into the corner in lieu of a kick-out flashing (25).

A true kick-out flashing, as shown in this photo of one of my siding jobs (26), is a large flashing that gathers water and directs it into the gutter. Note, too, how I detail the rake: I run a trim board along the rake, keeping this the required distance above the roof surface, and bring my siding board down to the trim, maintaining a ¼-inch gap that gets caulked. Details like this let me stay profitable and allow me to sleep at night.

*Mark Parlee, a building-envelope consultant (thebuildingconsultant.com) and builder (parleebuilders.com) in Urbandale, Iowa, specializes in exterior renovations and building envelope solutions.*

# Experience The Difference

# **Deck-Drive™**

PREMIUM FASTENERS

**DSV WOOD Screw**  
Preservative-Treated Decking and  
Exterior Wood-to-Wood Applications

**DWP WOOD SS Screw**  
Decking, Docks, and Boardwalks;  
Finishing, Millwork and Trim

**DHPD HARDWOOD Screw**  
Hardwood Decking, Docks  
and Boardwalks

**DCU COMPOSITE Screw**  
All Types of Composite Decking

**DCSD COMPOSITE-TO-STEEL Screw**  
Composite Decking  
to Steel Deck Framing

Experience Simpson Strong-Tie® Deck-Drive™ screws. Each screw is specifically designed for its application. Whether working with wood decking, premium composite or exotic hardwood, we have a fastener to fit the project – and it drives faster and easier than competitors.

Once you try one of our Deck-Drive fasteners, you'll want to experience them all. Contact your local rep for samples and a demo at (800) 999-5099 and learn more at [strongtie.com/deckdrive](http://strongtie.com/deckdrive).

**SIMPSON**

**Strong-Tie**

®

THE NEW 2015  
RAM PROMASTER  
RUN THE TOWN



ON THE  
JOB

BUSINESS LINK  
The best here for small business.

1) Based on large commercial vans when properly equipped. See dealer for details.  
Ram and Ram ProMaster are registered trademarks of FCA US LLC.

WALKS TALL,  
CARRIES  
**BIG STICKS**

BEST-IN-CLASS  
TURNING RADIUS  
36.3 FT\*

CLASS-EXCLUSIVE  
FRONT-WHEEL  
DRIVE

EXCEPTIONAL  
PAYLOAD  
4,420 LB

BLUEPRINT

RAMTRUCKS.COM/COMMERCIAL



# WINDOWS



## Installing High-Performance Windows Installation details must perform as well as the window itself

BY STEVE BACZEK AND STEVE DEMETRICK

As home construction has evolved and buildings have become more and more efficient, we have been turning to high-performance windows that keep pace with our wall systems. Recently we built a certified-passive new home in Rhode Island, and despite being on a tight budget, we opted for triple-glazed vinyl windows produced in Europe. The trick was installing them properly as an integral part of our complex wall system.

### INNIE, OUTIE, OR MIDI?

The walls in this home were 12 inches deep, and the first question we faced was where within that wall thickness the windows

would be placed. One consideration was aesthetics, of course. In addition, there were construction details that would need to be worked out. Locating the windows inward would require exterior extension jambs; locating them midway would require extension jambs on both sides of the windows, which would involve more work and more expense than a single, deeper extension jamb on just one side. In addition, any exterior materials would need to be detailed properly for water management.

We also considered durability of the wall system, occupant comfort, and thermal performance with the window at various positions. Putting a window in the inner third of an opening exposes a

# INSTALLING HIGH-PERFORMANCE WINDOWS



wall assembly to a greater risk of water damage, especially at the sill.

Installing a window in the outer third of a wall system, on the other hand, puts the window on the colder side of the opening and risks creating a micro-climate in the window opening, especially with smaller windows. This micro-climate could get cold enough for moisture to condense on the inside of the glass (a good case for triple glazing). Also, the colder the glass surface, the colder we feel when standing next to the window opening, because our warm bodies tend to radiate heat toward cold surfaces.

As far as thermal performance is concerned, the optimal position for a window is in the center third of an opening (4 inches to 8 inches from either side). This effectively places the window in the middle of the R-value of the wall.

For this house, we opted to set the exterior face of the window 5 inches in from the exterior surface of the sheathing.

## BUILDING THE OPENINGS

The windows we chose for this project were from Shuco and were framed in uPVC (unplasticized polyvinyl chloride, a more rigid and durable form of PVC). These triple-glazed windows have an overall U-value of .13, which translates to an R-value of 7.6. Each of the window units had either fixed glazing, a tilt-and-turn window, or a combination of the two, depending on its location in the house.

Delivery took about 12 weeks from the order date. With the windows sourced in Europe, we paid extra attention to the window schedule and to the accuracy of the order before placing it. The windows were delivered on schedule, in the correct sizes, and in good condition.

The wall system for this house consisted of a 2x6 exterior wall, a 2x4 interior wall, and a 3-inch space between the two walls, for an overall wall-frame depth of 12 inches. We oversized the width of the framed rough openings by 2 inches—1 inch for the OSB sheathing that lined the opening and 1 inch for the rough-opening width of the window. For the rough-opening height, we added 3 inches—1 inch for the OSB sheathing top and bottom, 1 inch for the sill dam, and 1 inch for the unit rough opening.

Because of the double-wall construction, we used ½-inch OSB Zip Wall sheathing to make the structural connection (bridging) between the interior and exterior framing at each of the openings. The sheathing in the openings was also a simple way to maintain the continuity of our external weather barrier, with the exterior sheathing essentially folding into each opening.

To prep for the “bridging” installation and to main-

tain continuity in our exterior air barrier, we applied a bead of acoustical sealant to the face of the 2x6 outer frame (1). We then bedded pieces of sheathing into the sealant around the perimeter of the opening (2).

At this point, we removed the exterior sheathing from the opening, using a flush-trim bit on a router (3). We had initially sheathed over the window openings to keep out the winter weather and, more importantly, to test the integrity of the Zip Wall as a continuous exterior air barrier. When we performed a blower-door test, the walls performed extremely well, as expected, at 38CFM@50pa.

## PREPPING THE SILLS

The router made quick work of cutting the openings, but left a bit of a mess, so we vacuumed and wiped down the openings. A clean surface was imperative for applying the various layers of tape during the preparation of the opening and the installation of the window.

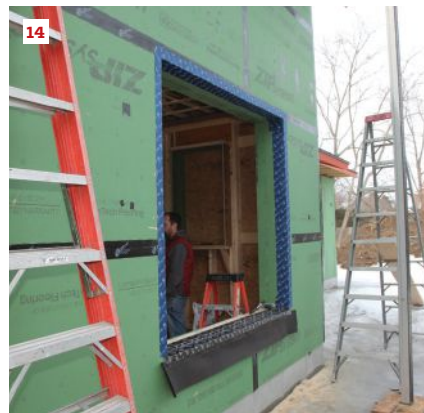
We began by sealing the sill-to-jamb intersection on both sides of the opening, using 3-M All Weather tape (4). Each piece of tape was carefully pressed into place and then rolled for maximum adhesion.

Next, we installed a 5/4-by-6-inch dam—which would eventually support the window—across the entire length of the sill (5). Because the dam was set inward in the rough opening to accommodate the placement of the window, we needed to provide a sloped drainage plane to direct any water to the outside. We ripped pieces of beveled siding to extend to the edge of the opening and nailed them into place across the full length of the sill (6).

Flashing tape is pretty flexible and to make sure it stays straight as it goes in, we always draw lines for positioning the edge of the tape. To keep the flashing tape even side-to-side, we marked the centerline of the dam. We cut the length of the flashing tape to the width of the opening plus 8 inches so it extended up the jambs 4 inches on both sides. Then we simply folded the tape in half lengthwise and lined up the fold with the centerline before peeling the back from the tape (7). We installed the flashing tape along our guideline about 2 inches from the edge of the dam (8). We folded the tape down the face of the dam and over the bevel siding, with the ends of the tape extending 4 inches up the jambs (9).

Below the opening, we stapled a 10-inch-wide strip of felt paper that would integrate with the felt-paper WRB that would be installed over the walls. Properly lapped, the felt paper will help to shed moisture under our exterior finish (10). We then folded down and adhered the remaining 2 inches of the flashing tape over the building paper. We neatly stretched and tucked the

## INSTALLING HIGH-PERFORMANCE WINDOWS



tape out over both corners and carefully rolled every surface of the flashing to complete the sill flashing (11).

### FLASH THE REST OF THE OPENING

Next we applied flashing tape shingle-fashion to both jambs, with the lower portion of the jamb flashing lapped over the up-turned portion of the sill flashing (12). We placed the guidelines for the jamb flashing so the inside edge would be near the middle of the dam and inside the exterior face of the window when it was installed.

The final piece of flashing sealed the head of the opening. The head flashing extended down over the jamb flashing, and we had to do a bit of origami, cutting and folding the corner and then adding a small piece of flashing material to seal the intersection of the three planes (13). With the flashing for the opening installed and neatly rolled out, we were finally ready for the window (14).

### BRING ON THE WINDOW

We put scraps of OSB sheathing on top of the 5/4 dam (15) to provide points for shimming the window if needed. These shims also

provided space for the expanding foam sealant that would be used when the house was insulated.

The windows do not have an integral flange for attaching them in the openings. Instead, metal installation brackets snap into grooves around the perimeter of the window unit. We installed them roughly 24 inches apart, starting about 6 inches in from the corners (16).

We removed the operable sash of the unit to help reduce the unit's weight (triple-glazed windows can be pretty heavy). With the help of suction cups and three strong backs, we maneuvered the window into place (17). While one person steadied the window in the opening, we screwed temporary 2-by blocks in the opening to hold the window at roughly its finished inside-to-outside location (18).

We used a Winbag inflatable bladder to tweak the window side-to-side in the opening and to adjust the unit for plumb (19). After double-checking the placement, we screwed the brackets to the opening to secure the window in its final position (20). The free side of the opening for the operable portion of the window is attached with screws driven through the frame (21).



# INSTALLING HIGH-PERFORMANCE WINDOWS





## SEAL THE WINDOW TO THE OPENING

The final step was sealing the window to the opening to incorporate it into the exterior weather barrier, moisture-management system, and exterior air barrier of the house. We began by flashing the window to the sill of the opening. We made a light pencil mark along the bottom frame of the window about ½ inch up to guide the placement of the flashing, ensuring that the longitudinal weep holes in the window frame weren't compromised **(22)**.

The flashing tape we chose for sealing the window to the opening was different from the flashing tape we'd used to seal the opening itself. We used a “vapor open” tape—a Proclima product called Contega Solido Exo—which both repels water from precipitation and allows vapor to pass through it. This means that any moisture from the interior of the home that might get into the area around the window can dry to the outside before it causes damage.

We peeled the backing from the top inch of the tape and then worked across the window, adhering the tape a few inches at a time. An extra set of hands helps to keep the tape extended while you're sticking it in place **(23)**. Once the tape was attached to the entire length of the window frame, we peeled off the rest of the backing and smoothed the tape down the face of the dam and onto the sill flashing tape **(24)**.

As on the sill, we adhered the jamb flashing to the window frame first and then extended it over to the previously installed jamb flashing for the rough opening **(25)**. We used the butt edge of a cedar shingle to press the flashing tape into the 90-degree corner **(26)**. The bottom ends of the jamb flashing tape extend down to lap over the sill flashing. We repeated the same steps to install the head flashing for the window **(27)**, with the ends of the head flashing lapping onto the tops of the jamb flashing to complete the window install.

With all the windows installed, we tested them for leaks by spraying water directly onto each one for about 10 minutes total. Our installation strategies proved successful, as our testing revealed no leaks. We also did a final blower door test: The results were 36CFM@50 pa. for .16ACH50—well within the range for Passive House certification. With our earlier test for comparison, we can gauge the airtightness that was lost by the window install to guide us in future projects.

*Steve Baczek, of Reading, Mass., is an architect specializing in energy-efficient design and certified passive homes. [stevenbaczekarchitect.com](http://stevenbaczekarchitect.com)*

*Steve Demetrick is a residential builder and remodeling contractor in Wakefield, R.I.*





DURABLE  
INDUCTION-HARDENED  
CUTTING EDGES

**2X**  
CUTTING  
POWER\*

**NEW**



**1/2**  
EFFORT



FEATURES  
INNOVATIVE  
POWERSLOT  
TECHNOLOGY  
FOR MAXIMUM  
LEVERAGE

THREE-ZONE  
COMFORT GRIPS  
FOR OPTIMUM  
CUSHION  
AND CONTROL

2

1

3

DO MORE  
ON THE  
JOB



irwin.com

**IRWIN VISE-GRIP  
CUTTING PLIERS WITH POWERSLOT**

The compound action of the three-piece PowerSlot design provides maximum leverage and easier cutting on even the most abusive jobsite materials.

Backed by the IRWIN VISE-GRIP Lifetime Guarantee.  
Experience the cutting difference for yourself at your local tools retailer or distributor.

**IRWIN®**  
**VISE-GRIP®**

\*Average cutting performance of PowerSlot pliers in 14/2 Romex vs. standard IRWIN Pliers of same variety. ©2015 IRWIN Industrial Tools. All Rights Reserved.

# FINISH CARPENTRY



## A Builder's Guide to Pocket Hole Joinery An efficient and durable way to join wood on site

BY GARY STRIEGLER

Since I first started working as a carpenter (more than 40 years ago), I have enjoyed the challenge of a client showing me a picture from a book or magazine and asking, “Can you do that?” These projects have ranged from elaborate mantels, staircases, and built-ins to wainscot, custom doors, and out-of-the-ordinary trim details. As my career progressed, I realized that most of these demanding projects required a way to join wood other than nailing pieces together.

At first I used dowels, and then I switched to a biscuit joiner, but things really changed for me when I saw the Kreg pocket-hole jig for the first time, at a trade show. What jumped out for me was that

pocket-hole joints are very forgiving—I would need to machine only one side of the joint, and on large projects, I would be able to work on only one joint at a time (with dowels or biscuits, the whole project needs to go together at one time).

The next thing that grabbed my attention was the speed of pocket-hole joinery: It took only a couple of seconds to drill the holes and a few more seconds to drive the screws to create a finished joint. Additionally, I could simply clamp the joint together while I drove the screws, and I wouldn't need to spend time waiting for glue to dry. I was hooked and couldn't get my credit card out of my wallet fast enough.

Photos by Gary Striegler

### BEFORE YOU BRING OUT THE JIG

A pocket-hole joint starts with holes drilled at a very steep (15-degree) angle, with a jig. A specialty bit creates a flat-bottom hole, and a stop collar sets the bit at the correct depth for the material you are joining. You then drive pan-head screws to join the two sides.

Since buying my first pocket-hole joinery kit more than 15 years ago, I have developed a checklist for making the best joints possible. Though this list is for pocket-hole work, some of these rules can apply to any type of joinery:

- Always work with clean, square edges. I run lumber through a jointer or on-edge through a planer to eliminate saw-blade marks and any unevenness along the edges that will be joined.
- Set your saw to cut perfectly square, and use a good, sharp blade in your saw for clean cuts.
- Eliminate variations in thickness with a thickness planer.
- Plan your joints so that the screws will be driven into the edge of the wood—never into the end grain.

### HELPFUL POCKET-SCREW CLAMPS

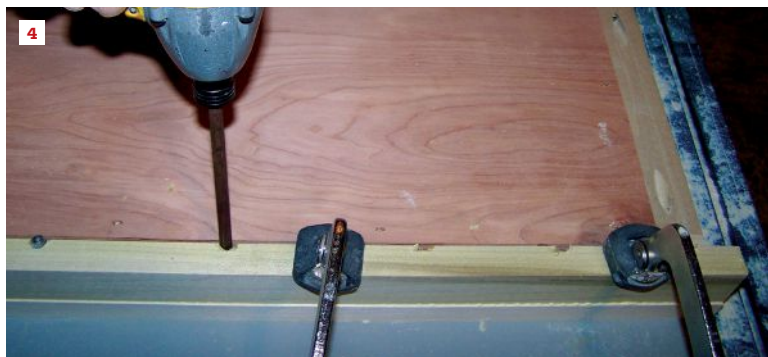
Quick-release clamps are essential for working efficiently with pocket-hole joinery. The most common are face clamps that are basically locking pliers with giant jaws. The ends of the jaws have wide, flat “washers” or pads that span the two pieces you are screwing together, to hold the faces flush (1). The pliers action lets you tighten and release the clamps quickly when moving from one screw position to the next. These clamps come in a variety of “reaches” to accommodate different depths that you need to clamp.

Another useful tool is a right-angle clamp. Instead of both jaws being flat, one jaw has a rounded taper, which slips into the pocket-screw hole to hold two pieces at right angles to each other (2).

I frequently use my workbench with a couple of different bench clamps that are a huge help. Plate clamps have a metal plate that you mount flush with the workbench top (3). The plate has a key way into which you insert the clamp. The entire bench top then becomes the other “jaw” of the clamp.

I also have a Kreg clamp table that has special metal track along two edges. The key way in this track accepts the same clamps as the plate system, and you can use more than one clamp to hold work on the bench as you drive the pocket screws (4). You can buy lengths of track to attach to your own workbench, too. Bench-top clamps stabilize the work better than face clamps do.

*Gary Striegler is the president of Craftsman Builders, in Fayetteville, Ark. [craftsmanbuildersnwa.com](http://craftsmanbuildersnwa.com)*





## FRAME AND PANEL: POCKET HOLE 101

The first projects I used pocket hole joinery for were frame-and-panel trim details on wainscot, over-mantels, and the like. For those, I pocket-screw a frame together, attach plywood to the back of the frame, and then fit panel molding inside the frame.

I still use pocket-screw joinery for frame-and-panel

trim details more than anything else (5). Most of the time, I staple the plywood to the back of the frame or, if I use 1/4-inch plywood for the panel, I rabbet the back of the frame to accept the panel (6). For wainscot, I often cut the panel to fit inside the frame.

For many projects, such as mantel pilasters, the frame-and-panel details need to be thicker than the

3/4-inch frame. Rather than using thicker wood, I can build a corner return, pocket-screwing a narrow piece of 1-by to a 3/4-inch frame to simulate a thicker, richer-looking mantel pilaster (7).

I start by making sure that the ripped piece has a clean edge that is free of saw marks, and I drill pocket-screw holes every 4 inches along the edge. To get a great joint, I squeeze

out a bead of glue along the edge of the ripping and attach it about 1/16 inch in from the edge of the frame. As soon as the last screw is driven, I wipe off the excess glue and rout the edge with a flush trim bit (8). With a little sanding, the joint becomes almost invisible, and the pilaster looks like a single, thick board. This trick also works great for adding depth to fluted pieces.



### EDGE BANDING FOR SHELVES AND COUNTERTOPS

In the houses we build, we install a lot of plywood mantels, shelves, and countertops. It's much faster and cheaper than edge-gluing solid lumber, and the plywood stays pretty straight and flat. The only drawback is you must cover the veneer edge with a strip of lumber or molding. To get a really good joint, I used to clamp the edge strip to the plywood about every 5 inches and then leave the clamps in place for at least a half-hour until the glue dried.

Now I just use a pocket screw every 5 inches or so, and I can skip all the clamps as well as the time waiting for the glue to dry (9). Pocket screws go in at an angle and can pull pieces out of alignment, so I make sure that the edge strip or molding is flush with or slightly proud of the veneer surface after the screws are driven. I use a plate clamp at each screw location to hold the edge piece flush with the plywood while I drive the screw. To leave the edge strip slightly above the plywood for a bit of final sanding, I sometimes add a couple of thicknesses of masking tape to the part of the plate that will be in contact with the plywood (10). I have also added edge banding to MDF in the same manner (11). The MDF is much more forgiving, because you don't need to worry about sanding through the veneer.



### EDGE-GLUING BOARDS

When I need to edge-glue solid lumber for things like custom stair treads (12), I often just pocket-screw the boards together one strip at a time. The biggest advantages are that I don't need to use a lot of clamps and I don't need to wait for the glue to dry. For curved-stair work, I glue up the angled pieces for the stair treads using pipe clamps, but then I attach the bullnose edging to the tread with pocket screws (13).



### CABINETS AND BUILT-INS

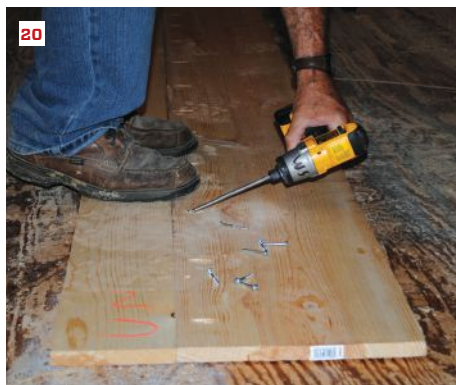
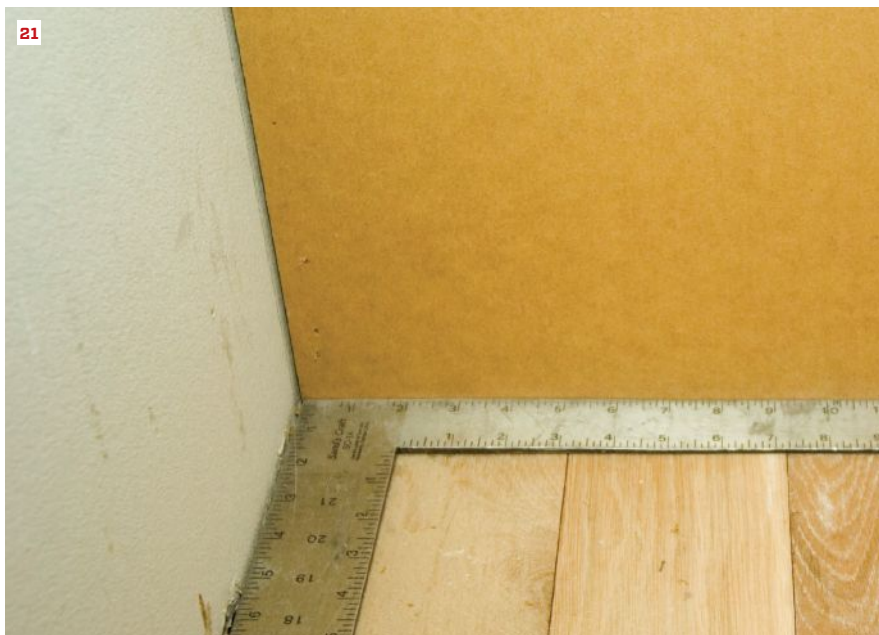
On every project, there always seem to be a few cabinets that I build on site. Window seats and closet built-ins are great examples. I build these cabinets using pocket screws for many of the joints. To attach the tops and bottoms, I use a shallow dado just deep enough to hide the joint. Then 1-inch pocket screws (along with glue) give strength to the joint and pull it together (14). At the top back of each cabinet, I pocket-screw a stretcher rail for attaching the plywood back and for screwing the cabinet to the wall (15). The pocket screws are stronger than nails, and I don't have nail holes to fill. I also use pocket screws to join the plywood cabinet carcass to the face frame (16) and to build strong drawer boxes that have no visible fasteners (17).

For simple doors, I pocket-screw a frame together with butt joints, and rout a panel in from the back, with molding around the opening in the front. Changing the width of the frame and the molding profile gives me dozens of door styles. Another option is building the doors with mitered corners (18). For this type of cabinet door, I make the frames from 2<sup>3</sup>/<sub>4</sub>-inch-wide material, which is wide enough for drilling two holes at each joint using the Kreg Micro jig.

## BOX BEAMS

We install a lot of box beams made from 1x12 pine (the nicest finish lumber available in this area). For most jobs, I rip a 1x12 in half for the bottom and then pocket-screw 1x12 sides to it (19). Pocket screws give me tight joints that will look good for the long haul.

If we stagger the butt joints of the pieces, we can easily build beams 16 feet or longer. If we need to make beams with sides wider than 12 inches, we pocket-screw the wide boards instead of using clamps. This works best as a two-person job: one person to drive the screws and one to stand on the boards to keep the faces lined up (20). We still glue the joint and sand the wide boards, but the joints are nearly invisible when we are finished.





## POCKET SCREWS INSTEAD OF TOENAILS

As a carpenter, I use toenails to hold boards in place on just about every one of our projects. A long pocket screw can function like a toenail on steroids. A pocket screw will always be stronger than a nail, and it can be backed out if you change your mind.

The first time I used a pocket screw instead of a toenail was to attach the vertical element of a closet system to the floor (21).

That worked so well that I began to use long pocket screws to anchor box newel posts to staircases (22), and to attach cabinets to floors, bar tops to cabinets, and display shelves to walls (note, however, that for any structural application of screws as anchors, you should always get approval from the local building official).

Using a hand-held jig, I've even used pocket screws to remedy squeaky stairs and floors from the bottom side. I also figured out that I could pocket-screw treads to risers to create a much stronger stairway (23).



## TEMPORARY CONNECTIONS

I've shown many examples of how pocket screws can make strong and permanent joints. But pocket screws are also incredibly useful for making strong temporary joints. Cabinetmakers use pocket screws all the time for temporary support at places such as dishwasher openings.

I often assemble cased openings on the workbench, with a spacer pocket-screwed to both sides at the bottom. After installing the unit, I back out the screws and remove the spacer. Pocket screws are handy if I have a curved-top opening—I use a temporary spreader to hold the arch at the proper width and then attach the jamb legs with pocket screws (24).

At trade shows, using pocket screws speeds up building and breaking down our booth, and I use pocket screws to secure the booth parts in my trailer. I even use pocket screws to make the workbenches that I use for pocket-screwing (25).





## Cable Railing Simplified



### Easy To...

**Understand**

**Quote**

**Install**

- 1st Vertical Railing Panel System in the Cable Railing Industry
- Pre-assembled for ease of installation
- 316 Marine Grade Stainless Steel Cable and Components
- Works with Wood, Composite, Vinyl and Metal Posts
- Quick and Easy Installation

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

## Energy Codes Force Framing Evolution

**In a world where the bleeding edge** gets a lot of press, it's worth pausing occasionally to remember that big production builders still account for a third or more of single-family housing starts in the United States. And if you're not a big production builder (or working for one), you may well be competing against builders in your market who are using mass-production techniques to bang out mass-market homes at a mass-market price. That competition doesn't leave you much wiggle room for experimenting. It's fun to build an ultra-efficient house, but it's hard. Even harder is selling that house at a profit in a competitive market.

Energy efficiency is one way for a small builder to compete effectively with the big guys. But the big guys are competitive too. When it comes to energy efficiency, production builders are also pushing their limits—but they're doing that under the discipline of rigorous cost control. That's why the Department of Energy's Building

America program, whose goal is to change mainstream building practices, focuses on evolving incremental improvements that can boost a home's energy performance without adding too much to the cost—or better yet, improve the energy equation while actually saving money on construction.

One good example of this approach is the research into “advanced framing” that's going on at the Home Innovation Research Labs (formerly known as NAHB Research). Engineer Vladimir Kochkin has been looking into the structural capabilities of advanced framing methods. Kochkin has studied four changes that production builders could make to improve the thermal performance and airtightness of their building shells, without spending a whole lot on the upgrade: two-foot on-center framing for walls; raised-heel trusses for increased attic insulation; continuous drywall where partitions intersect exterior walls; and headers integrated into the rim joist. The point is to boost insulation, improve airtightness, and reduce thermal bridging—all with framing changes that production framers can easily wrap their heads around.

“Advanced framing” has been around a long time. Introduced as “optimum value engineering,” or OVE, by the Department of Housing and Urban Development (HUD) in the 1960s, the concept is simple: Use less wood in the wall so you can use more insulation. For decades, the idea has hung around without really catching on. But in recent years, as government policy has driven a rapid toughening of the energy code, advanced framing has started to emerge as an important strategy for meeting code without pricing your product out of the market.

For builders in milder climate zones, the purest and simplest form of the advanced-framing concept is to switch from walls framed with 2x4s at 16 inches on-center to walls framed with 2x6s at 24 inches on-center. The two versions use roughly the same amount of wood and have roughly the same bearing capacity, but the 2x6 wall has about 30% less thermal bridging. The 2x6 wall's greater stiffness against lateral wind loads on the face of the wall is a freebie, and the reduction in construction labor—fewer pieces to handle, fewer nails to drive—offers a net savings. Other wood-reduction tricks, such as two-stud corners, cut thermal bridging further.

But more-complicated changes, such as rim-joist



Integrating bearing headers into the rim joist—or, in the case of non-load-bearing walls, omitting the header entirely—can reduce thermal bridging and improve wall performance while reducing framing costs.

headers and “energy heel” trusses, raise engineering questions. Can a header integrated into the band joist really carry the required load? Will raised-heel trusses topple if a wind load pushes the roof sideways? As engineers take a closer look at the structural issues involved in meeting the energy code, framing solutions that work are finding their way out of the engineering lab and into the building code.

A January 2013 report from Home Innovation Research Labs, “High-R Walls for New Construction Structural Performance: Integrated Rim Header Testing,” lays out the results of load testing for band-joint headers that need to carry floor loads as well as wall loads. That study helped the officials revising the International Residential Code (IRC) create prescriptive standards for load-bearing rim headers, which have now been written into the 2015 edition of the code.

Another Home Innovation Research Labs investigation, into structural bracing for raised-heel trusses, hasn’t found its way into the code yet. But the observations from that study indicate that raised-heel trusses, which allow for deep insulation levels over the wall plate in a pitched roof, can be effectively braced against toppling just by extending wall sheathing up onto the vertical heel portion of the truss, rather than with complicated solid blocking between trusses. The IRC method is limited to low-wind-speed zones and relatively low truss-heel heights. But builders can push those limits with the help of an engineer.

“In the last few code cycles, more and more of this is showing up in the IRC,” says Randy Melvin. Melvin, who is now an independent building industry consultant, worked until recently as the director of research and standards for Winchester Homes in Virginia and Maryland, and he spearheaded Winchester’s involvement in a field trial of advanced framing methods in cooperation with Home Innovation Research Labs.

“You need to check with your code official,” says Melvin. “There are parts of the country that are still back on the 2000 code. But most jurisdictions—if you reference a section of newer code, even though that jurisdiction is on the older code—will permit you to use the newer section of code.”



Raised-heel trusses allow for deep insulation above exterior wall plates, but complicated blocking between trusses can add labor cost. However, research shows that properly installed sheathing provides sufficient bracing in many cases.

For Winchester Homes, using advanced framing was the most practical approach to meeting the toughening Maryland and Virginia codes—and it positioned the company well for future code advances. At the International Builders’ Show in Las Vegas, Melvin, who was still on Winchester’s payroll at the time, told a seminar group: “We looked at different systems, and we determined that advanced framing made the most sense because of cost and flexibility, and because it’s a limited departure from what we were already doing. It’s not a big change for the trade base, and that’s really critical—because if it doesn’t work with the trade base, it’s not going to work.” After proving the concept in a model home, Winchester moved the methods into production and applied them to all its house plans.

With the advanced framing advantage, Melvin says, builders can reach performance equivalent to R-20 using an R-19 batt,

because of the reduced thermal bridging factor. Switching to R-21 batts instead would have resulted in a marginal improvement at a serious up-charge in price; sticking with R-19 batts and improving the framing system saved more energy while also reducing framing labor. And the method future-proofs builders against the next code change: With Owens Corning ProPink L-77 blown-in fiberglass insulation, a 2x6 wall framed at 24 inches on-center can achieve R-24 with no change in framing.

“So we are good to R-24 right away, no problem,” Melvin told his Builders’ Show audience. “But if it goes up beyond that, maybe we could add a couple of inches of high-density closed-cell polyurethane inside, and then eventually, maybe some additional insulation outside. So this is a very expandable system.”

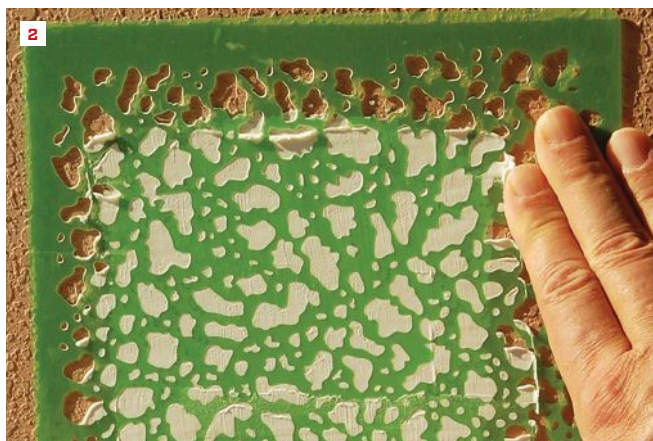
*Ted Cushman is a senior editor at JLC.*

BY LAUREN HUNTER



### 1. Quiet Clean

Available starting at about \$600, Bosch's new Ascenta dishwashers operate as quietly as 46 dBA, which is quieter than previous models and most household conversations. Multiple levels on the adjustable top rack accommodate tall glasses or large pots; flip tines fold down to customize the space; and a knife rack makes cleaning sharp utensils safer. Cycle options include one that cleans and dries in 60 minutes and another with a hotter final rinse and longer drying phase. Choose from black, white, or stainless steel. [bosch-home.com](http://bosch-home.com)



### 2. Opportunity Knocks

Simplify the messy and time-consuming repair of drywall knockdown treatment with Template LLC's Drywall Repair Tool. The flexible plastic template has a random design that helps users replicate a wall's knockdown texture after a drywall repair has been made. Requiring only spackle and a putty knife, the process is cleaner than using a spray application. Three designs help ensure a match to common patterns. Templates are available online for \$18 each or in a 3-pack for \$36. [drywallrepairtool.com](http://drywallrepairtool.com)



### 3. Got Your Back

Designed by a contractor, the Back Butter Buddy (BBB) is a "Lazy Susan" for tile installers. Capable of spinning 360 degrees and of supporting up to 200 pounds of stacked tiles, the BBB rests on a 3-gallon or 5-gallon bucket and allows users to apply a coat of setting material onto the tile with a quick spin. See the BBB in action on the company's website. It's priced at around \$24. [primo-tools.com](http://primo-tools.com)

### 4. Barrier-free

Laticrete's Hydro Ban Barrier Free Shower System combines a variety of Laticrete products to create a waterproof assembly for a barrier-free shower. Grate height adjusts for a number of tile or stone thicknesses. The system is suitable for showers with either bonding-flange drains or linear drains; both drain types can be installed with Laticrete's 3701 fortified mortar to form a gentle slope into the shower. A linear drain and pre-sloped shower pan combination is also available for installation over existing or recessed substrates. [laticrete.com](http://laticrete.com)

## Products

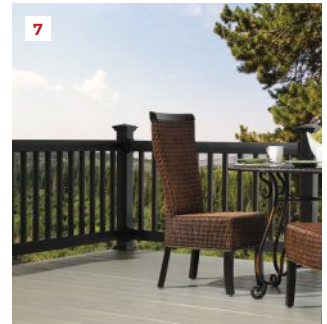
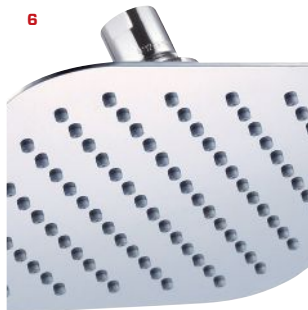
### 5. A Star is Born

The Stella freestanding bath brings a combination of distinct lines, soft curves, and asymmetry for a stylish modern design. The tub's chrome linear overflow drain is integral to the bathtub and is conveniently pre-installed and included in the \$2,750 retail price. Stella comes in a white high-gloss acrylic for easy cleaning. The tub offers generous dimensions—67 inches long, 31 inches wide, and 28 1/4 inches deep. Although Jacuzzi is known for its jetted tubs, Stella is part of the soaker-tub product line. [jacuzzi.com](http://jacuzzi.com)



### 6. We're All Wet

With a name like Drench, Danze's newest showerhead promises a good soaking. The sleek, square design comes in chrome and brushed-nickel finishes in 8- and 10-inch versions that offer a downpour spray through easy-to-clean rubber jets at a flow rate of 2.5 gallons per minute. A brass ball joint makes it easy to change the showerhead position. Prices range from \$200 to \$375. [danze.com](http://danze.com)



### 7. Boxing Day

Ply Gem has packaged into a kit all the components needed to build a railing. Express Boxed PVC Railing is available in two styles—T-Rail and Standard Railing—in colors including khaki, white, black, and brown. Standard Railing, which the company describes as contemporary, comes in 36- and 42-inch heights and in widths of 6, 8, and 10 feet. Pickets come in a variety of sizes. T-Rail, a “classic” design, also is available in 36- and 42-inch heights, in a width of 8 feet. Like Standard Railing, it incorporates a 4x4 post. Check with your dealer for pricing. [outdoor.plygem.com](http://outdoor.plygem.com)



### 8. Classic Entrance

The Heritage Series of molded interior doors look at home in both traditional and modern houses. A recessed panel with the classic lines of a wood Shaker door complements a variety of styles and also marks an engineering advancement for Masonite, which re-engineered the door's core and adhesion process to achieve the recessed look without sacrificing structural integrity. Heritage doors are designed to complement the maker's VistaGrande exterior doors. Upgrades include a solid core to reduce noise transmission and to add heft, and a low-formaldehyde/VOC emissions option. Pricing was unavailable. [masonite.com](http://masonite.com)

# 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)

# STRONG-POINT®

Get the Point. Strong-Point.

## Strong-Point® Decking Screws

For corrosion resistance, we've got you covered!

**STRONG-POINT Outdoor™**

500 hrs. Salt Spray Resistance

1,000 hrs. Salt Spray Resistance

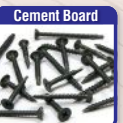
**STRONG-POINT Stainless™**



**Dacrotized®**

**WAR™**  
Corrosion Protection - ACQ Compatible

**305 Stainless Steel**



**INTERCORP** [www.strong-point.net](http://www.strong-point.net)

Los Angeles  
800.762.2004

Chicago  
800.533.9669

Atlanta  
800.822.9690

Dallas  
800.558.7222

Portland  
800.434.5606

Houston  
800.558.7222

Cleveland  
800.533.9669

Miami  
800.822.9690

## Products

### 9. Measuring Up

New eTape16 tape measures use a traditional blade with standard or metric markings (or both) and a digital readout accurate to  $\frac{1}{16}$  inch (1mm). A push of a button shows a measurement in inches, feet, fractions, and decimals, and converts to metric. Another touch of the button shows the outside measurement of the blade length or toggles to add the 3-inch case width. Other features include memory to retain a measurement after the blade is retracted, and memory that holds two readings after the tape shuts off. The eTape16 can calculate the center point of a measurement or measure the distance from a previously measured point without the blade being retracted. It costs \$30. [etape16.com](http://etape16.com)



### 10. Enduring the Elements

The Endure window series from ProVia has high-performance features that are third-party tested to meet energy-efficiency standards. Available with standard ProVia ComforTech Warm Edge Glazing System, the high-tech glass package is designed to improve thermal performance and can be specified up to R-9. The vinyl frames resist discoloration, warping, rotting, corrosion, denting, and rust, according to the maker, while other elements work to prevent air and moisture infiltration. Ask your dealer for pricing. [proviaproducts.com](http://proviaproducts.com)



### 11. Power On

With its steel frame protecting a Tier IV-compliant, industrial-grade diesel engine, the XD5000E generator can power tools, lights, and other equipment on the jobsite. The unit has single-touch electric start-up, and a 12-gallon fuel tank and fuel gauge, with a runtime of up to 32 hours at 50% load. Generac says electricity is generated with a low total harmonic distortion, for clean operation of electronics. Other features include four 120V 20A GFCI outlets and two twist-lock outlets, an integrated lifting eye, and an hour meter that tracks maintenance intervals. Priced at \$3,700. [generac.com](http://generac.com)



### 12. Home Comfort, Revisited

The energy-efficient Exteriores line from Panasonic rethinks the zone-conditioning aspect of mini-split systems. The ductless air-handler pulls in and conditions air from outside, then uses vent fans and minimal ducting to send conditioned air throughout the home. Occupancy-sensor-style technology adjusts the temperature setting when people are in the room. Both Exteriores models can be remotely controlled via Wi-Fi. [us.panasonic.com](http://us.panasonic.com)



# HOW MUCH ARE YOUR DOORS COSTING YOU?

[HINT: YOUR COSTS DON'T STOP AT THE DOOR.]



Are you settling for up-front savings over real world performance? If so, you may not be covered for even the most basic problems, costing you down the line. Stop settling for subpar sill performance and start saving with the next generation **Z-Articulating Cap Sill™**.



CALCULATE YOUR Z-AC SAVINGS NOW AT [ZACSAVES.COM](http://ZACSAVES.COM)



Whatever your job needs,  
there's a BLUE BEAR product for you.



**300SERIES**  
**300RE** Asphalt Remover  
**340TL** Asphalt Adhesion Preventer  
**360AR** Asphalt Release



**500SERIES**  
**500MR** Mastic Remover  
**540PM** Polyurethane Adhesive Remover



**600SERIES**  
**600GL** Coatings Remover  
**610SP** Sprayable Coatings Remover  
**690PB** Lead Paint Remover



**700SERIES**  
**700DG** Degreaser Concentrate  
**705CL** Ready-to-Use Degreaser



**800SERIES**  
**810ST** Steel Form Release  
**820US** Urethane/Silicone Form Release

For more products and information  
 Call: 800.538.5069 or visit [www.franmar.com](http://www.franmar.com)



Made in  
 the USA



# Transform your Drill into a Metal-Cutting Shear!



• Heavy Duty Attachment quickly fits 1/4 - 1/2 in. drills including 1/4 in. quick release chucks on impact drivers!

- Use it to make precise straight cuts, tight circles, or squares in 18-ga. (1.22 mm) sheet metal fast and easy.
- 360° Rotating Head secures in any position for optimum tool clearance and material flow

## Universal Fit!

Min 14.4 V-DC • Max 7 A-AC



**Malco**<sup>®</sup>

Work. Perform. Outlast.



**METALCON** Live Demos! Booth #401

Oct. 14-16, 2015 • Tampa Convention Center • Tampa Bay, Florida

Malco Products, Inc. | Annandale, Minnesota, U.S.A. | www.malcotools.com | © 2015

## TOOLS OF THE TRADE



Toolsofthetrade.net provides the most up-to-date information on the latest tools, accessories and equipment available to residential construction pros. It is the online source for tool information and readers rely on us for honest, thorough and up-to-date news on the latest products.

hanleywood

## 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)



BY TIM UHLER



## Paslode's New 21-Degree Framing Nailer

**Paslode recently released the F350-P 21-degree** plastic-collated framing nailer. This is interesting because until now, the company's framing guns drove 30-degree paper-tape fasteners—which typically have clipped heads but are also available with offset round heads.

There is a lot to like about this gun; it's well-balanced and feels solidly made. The magazine is solid too, which should translate to fewer jams over the long run.

The tool comes from the factory set to sequential fire, but can be converted to bump fire by removing a pin, lowering the trigger, and then reinstalling the pin. It took me about five minutes to make the conversion—most of it spent trying to get the tiny rubber O-ring back onto the pin.

Features include tool-less depth of drive, a heavily rubberized grip, and a nail lock-out mechanism to prevent dry firing. The over-size trigger is a plus, as it allows me to change my grip to nail at odd angles and still

be able to reach it for firing. The F350-P comes with a belt hook, though you have to remove a screw to switch sides.

I like that the air inlet is angled slightly to the right, because it prevents the magazine from getting in the way of connecting the hose. One of the few things the gun doesn't have is an adjustable exhaust port; on this model it's fixed.

### RESIN-COLLATED NAILS

When Paslode introduced the F350-P, it also introduced 21-degree resin-collated fasteners to go with it. These are a departure from the 30-degree paper-tape nails the company is known for—and from the plastic-collated nails our crew is accustomed to using.

When you frame with plastic-collated fasteners, you are bombarded by small bits of plastic—reason enough to wear eye protection, assuming you weren't already worried about getting hit by a nail. Paslode

collates its 21-degree nails with resin—and less of it than is usually the case with plastic-collated nails. As a result, there is less of it to fly around or “pile up” on the jobsite.

According to Paslode, the resin is more rugged than plastic and the 21-degree strips are less likely to break. That was not my experience; I found they broke more frequently than the TrueSpec strips we normally use. For me, breaking is less a matter of dropping strips than bashing them with the hook of the nail gun when hanging it from the pouch of my tool bags. I solved the problem by carrying spare strips in the pouch on the opposite side from where I hook the gun.

I like the new nails but am not sure I'd be willing to pay their premium price. At about \$0.02 per nail, they cost 25% more than the TrueSpec fasteners we normally use. The cost disparity is even greater if you compare Paslode nails with some of the cheap brands that can be found at many lumberyards.



**THE BOTTOM LINE**

The F350-P is a good gun. It would not be my first choice, though, if I were buying a stick nailer. We use Max high-pressure coil guns for most of our framing, though we do use stick guns for hot-dipped galvanized fasteners—which we prefer not to buy in coils. The stick nailers we currently use are a Max SN883RH2 and a Bostitch LFP-21PL—which were among the models we reviewed in 2013. We prefer these guns to the F350-P because they're each about a half-pound lighter. The Paslode does feel slightly more powerful than the Max, but it's also bulkier, and the line of sight along the right is obstructed by the depth-of-drive mechanism—which makes toenailing more difficult.

**F350-P SPECS**

- Collation:** 21 degrees; resin/plastic
- Nails:** full round head; 2 to 3 1/2 inches
- Magazine:** top-load
- Weight:** 8.1 pounds
- Height:** 13 inches
- Warranty:** 5 years
- Price:** \$280

*Tim Uhler is lead framer for Pioneer Builders, in Port Orchard, Wash.*



Irwin's ErgoMulti Long Nose pliers are larger than most long-nose pliers.

Photos by David Frane

## Angle-Head Pliers

BY DAVID FRANE

**I recently bought** a pair of Irwin Vise-Grip ErgoMulti Long Nose Pliers, which had been on my radar since their unveiling at last year's STAFDA convention. The design intrigued me and had me wondering if the angled head would make the tool easier to use. The answer is yes; with these pliers, you can work longer and harder with less fatigue to your wrist and hand.

The 62-degree angled head provides a neutral grip position, akin to the position you use when holding a drill or impact driver. Your wrist remains straight so there's less strain on your wrist and hand. And I think the "kink" of the handles in relation to the head provides additional leverage when twisting.

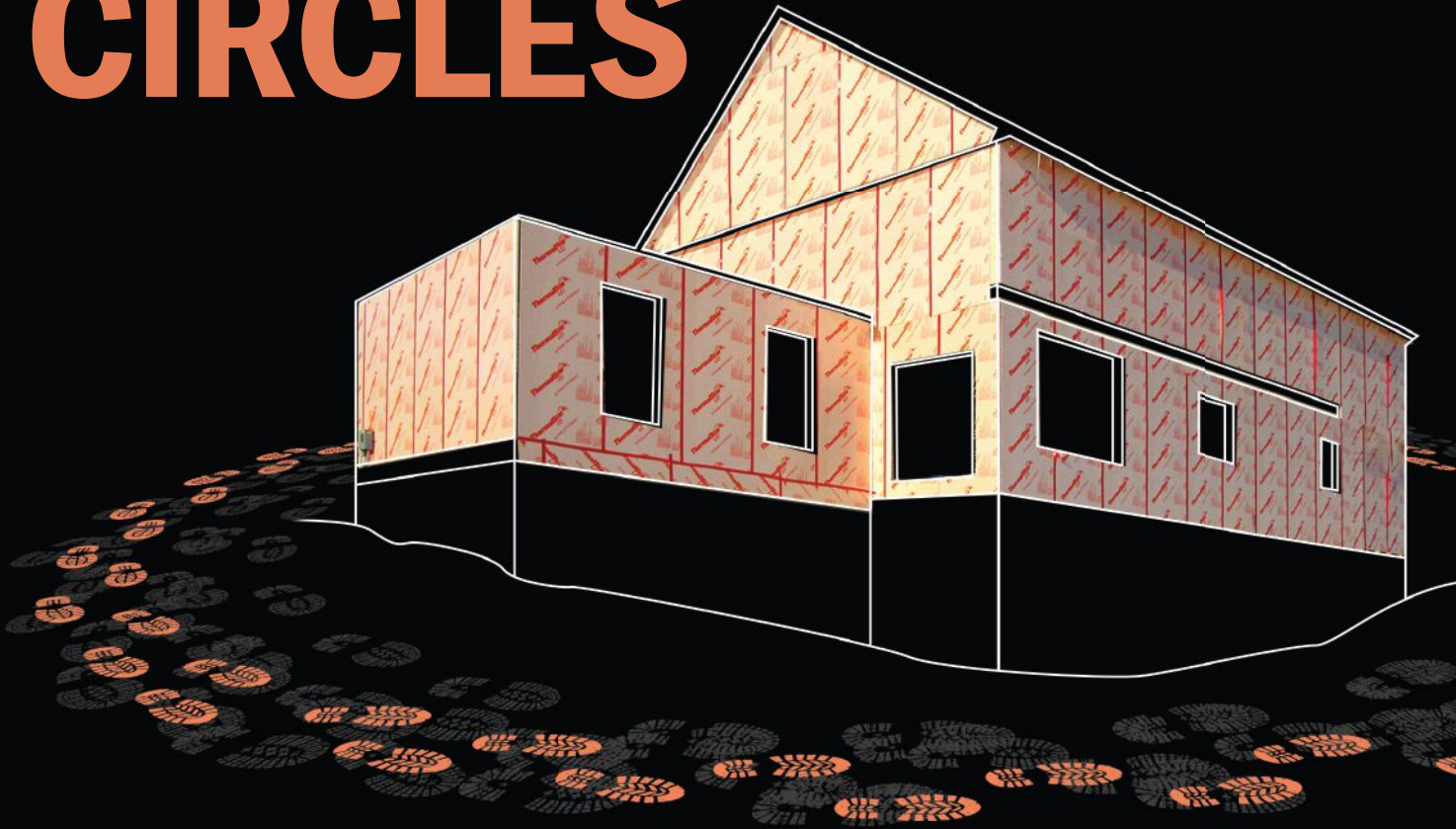
The size of the tool helps too. These are 8-inch pliers, which, as long-nose pliers go, is very large. The longer-than-"normal" handles make for greater leverage when you're cutting wire, nails, and screws. The overmolded handles are hard on the back and soft where you grip, so you can squeeze

really hard without hurting your hand.

The jaws are spring-loaded and automatically open when you release the grips—a feature I love because it makes the pliers faster and easier to use. A thumb-activated catch can be used to lock the jaws shut for ease of transport and storage. The lock is tucked away in a protected spot—which is good, because it's plastic and might break if it gets bashed. But its location is such that I don't think that's likely to happen. The jaws are equipped with a straight cutter, a small crimper, strippers for 12- and 14-gauge solid and 14- and 16-gauge stranded wire, and something you don't often see—a built-in "spanner" for turning nuts and bolts. The spanner is shaped like the surface of a box wrench; it's not something I use very often but is handy to have when I need to turn a nut or bolt and there aren't any wrenches or slip-joint pliers nearby.

If the design of these pliers looks familiar, it's because they are made for Irwin by NWS, a high-end German tool company that

# STOP going around in CIRCLES



## Once around is enough.

Build homes faster and stronger with lower moisture risk, higher overall R-value and reduced air infiltration—all in a single trip around the house. ThermalStar® LCI-SS™ offers unmatched performance in all types of climates for dramatically less cost to homeowners. And best of all, it's technology you can afford. Have it all and do it all in one step with ThermalStar LCI-SS.

R5 shown. R3 and R7.5 available.

[www.atlaseps.com/thermalstar](http://www.atlaseps.com/thermalstar)  
570-447-6556

**ThermalStar**®   
LCi-SS™

**Exclusive distribution by the Companies of Universal Forest Products**

ThermalStar and the Pale Creamy Color are registered trademarks of Atlas Roofing Corporation and used with permission.

© 2015 Universal Forest Products, Inc.





sells a nearly identical model under its own label. With only limited distribution in the U.S., it makes sense NWS would manufacture tools for a large company like Irwin. Most Irwin hand tools are made in Asia, but the 11 tools currently in Irwin's Vise-Grip Cutting Pliers line are made in Germany.

The ErgoMulti Long Nose Pliers aren't cheap; I bought them for \$30 online. I enjoy using them, and they should last the rest of my life—provided I don't lose them or lend them to someone who likes them as much as I do.

*David Frane is a former editor of Tools of the Trade.*

## Universal Dust Collection

BY DOUG MAHONEY

**It's great that so many tools** are equipped with dust-collection ports these days, but unless you are committed to a single brand, it can be difficult to connect the vacuum you have to the ports on various tools. Individual adapters are available, but many carpenters I know solve the problem by placing the big vac hose around the little tool dust port and wrapping the connection with a lot of blue tape. It's a solution, but not a very efficient one. Rockler's new Dust Right Universal Small Port Hose Kit is designed to bridge this gap by offering a wide range of tool-to-vac compatibility.

The kit consists of a high-quality hose with a 2¼-inch OD port on one end that attaches to the vac. This is compatible with vacs from Festool, Shop Vac, Craftsman, and others (but not Ridgid, which requires a larger port). The Rockler kit also comes with two flexible rubber dust ports, (1 and 1½-inch ID) that connect to the tool-end of the hose. These ports are rubbery and easily pliable, so they can also fit over a wide range of rectangular dust ports. They fit most of my power tools, but not all of them. The tiny

port on my Makita orbital sander, for example, was not compatible. On the other hand, the 1¼-inch port wrapped around my old Makita belt sander with a solid, though not perfect, fit. The dust bag of this tool is long gone and I had actually stopped using it because of that.

The ports each have a slight angle to them, which helps with managing the hose when the tool is being used. While connected to the hose, the two ports (and the port on the vac end) can spin freely to stop the hose from coiling while in use.

The hose is a high point: It's only about 3 feet long, but it can stretch to more than 13 feet. It stretches with light resistance, which takes a little getting used to. Also, the hose is heavier than other vac hoses. It's



very durable and didn't kink when it was accidentally stepped on a few times.

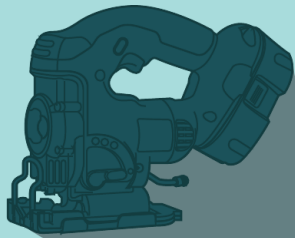
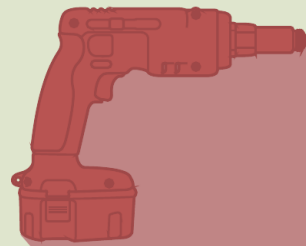
Unfortunately, the kit doesn't come with a carrying bag, which is not surprising considering that Rockler caters to the woodworking crowd and not the carpentry crowd. I'm planning on picking up a small duffel to hold the pieces.

At first I thought the \$40 price tag for this kit was high. But once I realized how nice the hose is and how well the system works, it seemed reasonable. Every element of this kit is thought out, from the durability of the hose to the free and easy swivel of the connections. It's going to solve a lot of problems on a jobsite (and save a lot of blue tape).

*Doug Mahoney is a carpenter in Harvard, Mass.*

# JLCLIVE

RESIDENTIAL CONSTRUCTION SHOW

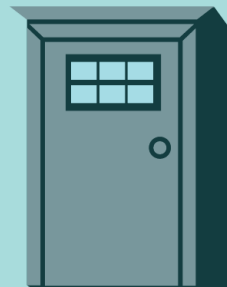
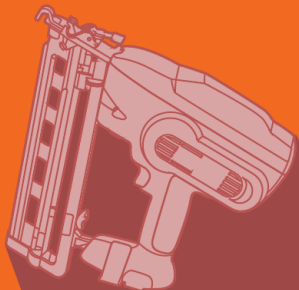


## CELEBRATING

# 20



# YEARS



### JOIN US IN PORTLAND!

Celebrate 20 years of JLC LIVE events at the premier trade show for residential builders and remodelers.

Register online at [www.JLCLIVE.com](http://www.JLCLIVE.com) for FREE when you use **PROMO CODE AD11**.

## NORTHWEST 2015

**EXHIBIT HALL** December 3 – 4

**CONFERENCE** December 2 – 4

Oregon Convention Center | Portland, Oregon

**STAY CONNECTED!** [www.JLCLIVE.com](http://www.JLCLIVE.com)



**Habitat**  
for Humanity®

Home Builders  
Blitz 2016

Be a part of Home Builders Blitz 2016!

Habitat's Home Builders Blitz is a partnership between Habitat affiliates and the local building community to make sure more families have the chance to live in a simple, decent home.

Our goal for June 6-10, 2016, is to build, renovate or repair 300 homes across the nation.

**Join us!**

**#HomeBuildersBlitz • [habitat.org/homebuildersblitz](http://habitat.org/homebuildersblitz)**



The American  
Institute  
of Architects



I  
AM  
AIA

“Architects design more than buildings—we design processes and we provide the facilitation, coordination and guidance that make projects successful, from concept through completion.”

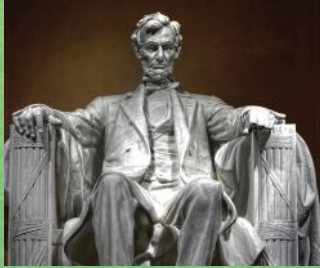
Jessyca Henderson, AIA Member since 2000

**Join me.**  
[aia.org/join](http://aia.org/join)

Join today and get free registration to AIA Convention 2016!\*

\*Some restrictions apply. Review terms and conditions at [aia.org/join](http://aia.org/join).

# WHAT DO ALL OF THESE HAVE IN COMMON?



# THEY ARE ALL MONUMENTAL

OUR BUILDINGS—HOMES, HOSPITALS, AND HIGH RISES - ARE MODERN MONUMENTS TO WHAT WE DEEM IMPORTANT

Green buildings rise up from our communities like beacons of innovation and thoughtfulness. Every facade tells a story, every foundation leaves a lasting impression—no marble inscription needed. Green building is uniting people, changing lives, revolutionizing business, and addressing our world's most pressing problems. And that's monumental.

Join us for the largest sustainable building event in the US and experience the contagious buzz first hand with over 20,000 industry professionals, world class expo hall, over 200 educational sessions and the world's leaders in the green movement.



## MONUMENTAL GREEN

WASHINGTON CONVENTION CENTER | WASHINGTON, D.C.  
EXPO: NOV 18-19 | CONFERENCE: NOV. 18-20



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



Get social [greenbuildexpo.com/GetSocial](http://greenbuildexpo.com/GetSocial)  
Questions? Contact us at [info@greenbuildexpo.com](mailto:info@greenbuildexpo.com)

informa  
exhibitions




Owned and operated by Informa Exhibitions. Presented by the U.S. Green Building Council.


# October Advertising Index

Advertiser	Page	Website
American Institute of Architects, The	77	aia.org/join
Bluebeam Software, Inc.	21	bluebeam.com/flexible
Chief Architect	11	chiefarchitect.com/FreeTrial
CL Kitchens, Bath & Closets	38	clkitchens.com/rebate
Crawford Contractor Connection	37	contractorconnection.com
Deckorators	29	Deckorators.com/GoBeyondOrdinary
Diablo	OBC	TheGameChanger.com
Dryer Wall Vent	67	Dryerbox.com
Endura Products, Inc.	69	zacsaves.com
FastenMaster	7	FastenMaster.com
Feeney, Inc.	6, 26	feeney5.com
Ford Motor Company	2-3	
Fortress Railing Products	62	fortressrailing.com
Franmar	69	franmar.com
Grace Construction Products	IFC-1	graceprosintheknow.com
Greenbuild	78	greenbuildexpo.com
Habitat for Humanity	76	habitat.org/homebuildersblitz
Home Depot, The	23, 35	
Intercorp/Strong-Point	67	strong-point.net
IRWIN Tools	54	irwin.com
JLC LIVE Northwest	75	JLCLIVE.com
Malco Products	70	malcotools.com
Marvin Windows and Doors	9	TheMarvinDifference.com
Maze Nails	12	MazeNails.com
MiTek Builder Products	11	USPconnectors.com/Decks
Panasonic Home & Environment	17	us.panasonic.com/ventfans
Pella Corporation	18	Pella.com/JLC
Protective Products	79	ProtectiveProducts.com
ProWood	IBC	ProWoodLumber.com
RAM Commercial Trucks	46	ramtrucks.com/commercial
Simpson Strong-Tie	25	strongtie.com/dttlz
Simpson Strong-Tie	45	strongtie.com/deckdrive
The Tapco Group/Kleer	32	KleerLumber.com
ThermalStar LCI-SS	73	atlaseps.com/thermalstar
Tjernlund Products, Inc.	79	tjernlund.com
Trex	4	trex.com
Wilsonart	14	wilsonart.com/quartz
Wolmanized Wood	16	wolmanizedwood.com
Work Truck Show, The	31	worktruckshow.com
ZipWall	30	zipwall.com

# Classifieds

## ZIPWALL® SYSTEMS





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

Take advantage of our extensive in-stock inventory and product knowledge to help you build your ultimate dust-control solution.

Call **1.800.789.6633** or visit [ProtectiveProducts.com](http://ProtectiveProducts.com)

## Dryer Duct Booster®

dramatically reduces drying times, lint build-up & saves energy



**Boosts long or restrictive dryer duct runs**

- ▶ Reduce drying times up to 60%
- ▶ Plug-in, automatic operation
- ▶ 5 year warranty



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

FOR INFORMATION

on how to be a part of the next

# JLC

special advertising section,

contact Maura Jacob at

678-451-8627



BY ROE OSBORN



## The Carpenter, With the Hammer in the Hall

**Last July I visited the Crosby Mansion** in the sleepy little rural town of Brewster, Mass., on Cape Cod. I'd been fascinated by the place since I moved to the Cape, and I jumped at the chance to take a tour. Coincidentally I'd just finished editing Gary Katz's article on classical trim ("A Look at Traditional Trim Designs," Aug/15), so I was primed to take an especially close look at the trim in this grand old home. The visit did not disappoint: The home displayed a virtual smorgasbord of styles and details, which I blogged about on the *JLC* website.

I found the strangest mix of door and window trim in the servants' quarters on the third floor of the mansion, which had recently been opened to the public after a huge restoration effort by the Crosby volunteers. This mix included a quirky wrapped-rosette **(1)** (a detail I'd also seen in the second-floor bedrooms) and, nearby, plain square-edge stock with a head casing that projected slightly past the jambs. In another example **(2)**, a window with plain trim was adjacent to a window with a more elaborate trim that sported a thicker, heavier profile with rounded back band and curved transitions between the

decorative elements. The flat head casing on this heavier trim, also found around a doorway in the hallway **(3)**, had to be quite thick to project over the heavy casing and looked too large and cumbersome, even with the cornice detail that wrapped around the top of the head casing. It was the only place in the mansion where the molding felt out of proportion—and was out of character with the level of detail in the rest of the home. (In his article, Katz had stressed proportion as being critical to details that pleased the eye.)

I longed to go back in time to find out how these odd details had come about. Did the owners run short of funds and change the detailing for the servants to something more affordable? Was that odd profile just something that was readily available from local suppliers? Did the carpenters resort to simpler details just to finish the place? Perhaps one of the volunteers knows—or maybe the answers are known only to the ghosts that folks have seen roaming the halls of the Crosby Mansion.

*Roe Osborn is a senior editor at JLC.*

Photos by Roe Osborn

COLOR-TREATED

## LUMBER THAT GOES THE DISTANCE.

**ProWood Dura Color**<sup>®</sup> employs the latest in treating technology. With ProWood Dura Color, colorant is driven deep into the wood fiber, creating beauty that's guaranteed to stand up to the elements for years. And because you don't have to spend time staining the lumber, you can spend more time mastering those difficult woods.

Visit [ProWoodLumber.com](http://ProWoodLumber.com)





# INTRODUCING THE GAME CHANGER

## THE FIRST CARBIDE TIPPED RECIP BLADE FOR METAL CUTTING!



The new Diablo Steel Demon carbide-tipped reciprocating blades are the first carbide-tipped blades designed for extreme metal cutting; including high strength alloys, cast iron, and stainless steel. These high performance carbide-tipped blades deliver unmatched 20 times longer cutting life than standard bi-metal blades in extreme thick metal cutting applications between 3/16" to 1/2".



Item#  
DS0608CF



**WATCH DEMO NOW!**  
SCAN WITH A SMART PHONE

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

Extreme metal cutting carbide-tipped recip blades are available in four lengths: 4" (DS0408CF), 6" (DS0608CF), 9" (DS0908CF), & 12" (DS1208CF)

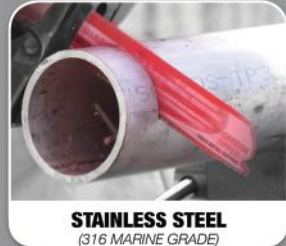
### FOR EXTREME THICK METAL CUTTING INCLUDING:



**CAST IRON**



**METALS & ALLOYS**



**STAINLESS STEEL**  
(316 MARINE GRADE)



**THICK METAL**  
(3/16" TO 1/2")



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



[www.Facebook.com/DiabloTools](http://www.Facebook.com/DiabloTools)



[www.Twitter.com/DiabloTools](http://www.Twitter.com/DiabloTools)



[www.YouTube.com/DiabloTools](http://www.YouTube.com/DiabloTools)