

Slate Roof Restoration

Wave-Patterned Shingles

Air-Sealing Update

Bonus Inside

PROFESSIONAL
DECK BUILDER



REBAR DEMON™

NEW! 4 Cutter

**FULL CARBIDE HEAD
HAMMER DRILL BITS**

TAKES
the **HEAT!**

UP TO
7X
LONGER LIFE
IN CONCRETE &
REINFORCED CONCRETE

TakesTheHeat.com

REBAR DEMON™

NEW! **4Cutter** FULL CARBIDE HEAD HAMMER DRILL BITS

**The Industry's Most Durable,
Fastest & Coolest Full Range
of SDS-Max® & SDS-Plus®**

Hammer Drill Bits

**Available in 75 Sizes
Ranging From 5/32"-2"**

facebook.com/**DiabloTools** | twitter.com/**DiabloTools**
instagram.com/**Diablo_Tools** | youtube.com/**DiabloTools**
tiktok.com/@**Diablo_Tools**

**Impact Resistant 4-Cutter
Full Carbide Head Design**

4Cutter full carbide head extracts smaller bites of rebar for controlled, consistent carbide wear and reduced vibration, delivering **FAST, PRECISE HOLES AND LONGER LIFE**

**DIABLO
MADE**

**DURA
CARBIDE™**

Up to **2x MORE**
DURA-CARBIDE*
withstands up to 1800°F
of intense heat to combat rebar
hits versus standard bits that
fail at 800°F

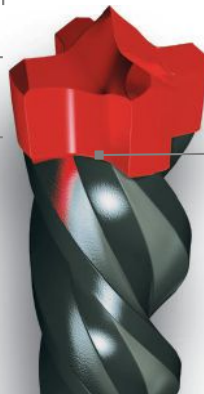


**DIABLO
REBAR DEMON™**

vs



**STD. 2-CUTTER
BRAZED**



**Tri-Metal
Fusion
Welding**

Up to **3x**
STRONGER WELD*
keeps full carbide head
intact during extreme
impact such as rebar

*vs. standard 2-cutter
brazed hammer bits

©2021 Freud America, Inc. All rights reserved.
All specifications subject to change without prior notice.

Learn More at TakesTheHeat.com

Chief Architect®

Smarter Design Software



Chief Architect 30 second rendering.
See more of this model online.

Download a Free Trial Version

Residential Design

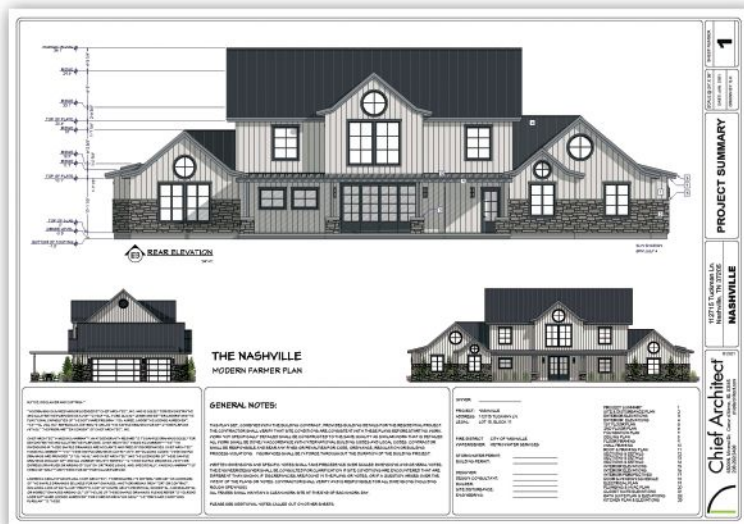
Remodeling & Cost Estimating

Kitchen, Bath, & Interior Design

3D Design, Floor Plans, Elevations

Construction Drawings

CAD Tools & Section Details



208.292.3400 • chiefarchitect.com/FreeTrial





On the cover: Micah Sanguedolce (at top) and Michael Dillon (cutting slate), of Stewardship Slate, restore a 100-year-old slate roof in Burlington, Vt. Photo by Sam Simon Imaging (samsimonimaging.com). See the story on page 33.

FEATURES

33. Slate Roof Restoration

As a long-term solution, slate proved more cost effective than an asphalt reroof

41. Gables of Waves

A custom wave pattern in cedar shingles complements the gable ends of seaside homes

DEPARTMENTS

5. Training the Trades

Caulking basics

11. Q&A

Pre-piping for radon; keeping critters out of heat pump condenser units

15. Code's Eye View

Air-sealing code update

21. Business

Facing down remodeling stigmas

25. Energy

How to size an ERV or HRV

29. Troubleshooting

Managing asbestos during a remodel

51. Products

Tile backer; fluid-applied membrane for masonry veneer; pull-down LED lighting; bidet; concrete repair FRP; structural panels; aluminum fencing; more

55. Tools of the Trade

Drill/driver kit; single-bevel sliding compound miter saw; green laser measure; hand-held cabinet jack

59. Advertising Index

60. Backfill

Fancy foyer floor

THE JOURNAL OF LIGHT CONSTRUCTION (ISSN 1056-828X), Volume 39, Number 9, is published 10 times per year (January, February, March, April, May, June, July/August, September, October, November/December) by Zonda Media, 1152 15th St. NW, Suite 750, Washington, DC 20005. Annual subscription rate for qualified readers in the construction trades: \$39.95; nonqualified annual subscription rate: \$59.95. Frequency of all magazines subject to change without notice. Double issues may be published, which count as 2 issues. Publisher reserves the right to determine recipient qualification. Copyright 2021 by Zonda Media. All rights reserved. Canada Post Registration #40612608/G.S.T. number: R-120931738. Canadian return address: IMEX, PO Box 25542, London, ON N6C 6B2. Periodicals postage paid at Washington, DC, and at additional mailing offices. POSTMASTER: Send address changes to JLC, Box 3530 Northbrook IL 60065-3530.



JLCONLINE.COM

Chief Editor, JLC Group Clayton DeKorne, cdekorne@zondahome.com
Executive Editor, JLC Group Andrew Wormer, awormer@zondahome.com
Managing Editor Laurie Elden, lelden@zondahome.com
Senior Editor Tim Healey, thealey@zondahome.com
Associate Editor, Products Vincent Salandro, vsalandro@zondahome.com

Senior Design Director Tina Tabibi, ttabibi@zondahome.com
Freelance Designer Melissa Krochmal, mkrochmal@zondahome.com

Contributing Editors Mark Clement, Ted Cushman, Dave Holbrook, Tom Meehan, Roe Osborn, Matt Risinger, Emanuel Silva, Gary Striegler, Tim Uhler

Senior Director, Print Production Cathy Underwood
Senior Director, Print Production Margaret M. Coulter
Ad Production Coordinator Bernadette Couture
Production Manager, Inside Sales Stephanie Fischer
Group Director, Audience Marketing & Circulation Christina Lustan

PUBLISHED BY ZONDA MEDIA

Chief Executive Officer Jeff Meyers
Chief Financial Officer Melissa Billiter
Chief Operating Officer Andrew Reid
Executive V.P., Chief Content Officer Jennifer Pearce
V.P., Digital Strategy and Operations Bridget Forbes
V.P., Audience Development and Analytics Jennifer Malkasian
V.P., Marketing Lillian Spio
Group V.P., Talent Strategy Kurt Nelson
Executive V.P., National Sales Amy Dudley
Senior Managing Principal, Advisory Group Tim Sullivan

Editorial & Advertising Offices:
The Journal of Light Construction,
Zonda Media
1152 15th St. NW, Suite 750
Washington, DC 20005
202.452.0800

JLC will occasionally write about companies in which its parent organization, Zonda Media, 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.

INFORMATION DIRECTORY

CONTACT INFORMATION

jlconline.com
JLC
Zonda Media
1152 15th St. NW, Suite 750
Washington, DC 20005

EDITORIAL

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

SUBSCRIPTION SERVICES

For help with your JLC subscription, contact us:

Online: jlconline.com/cs
Email: jlconline@zondahome.com
Phone: 888.269.8410
Mail: JLC, PO Box 3530, Northbrook IL 60065-3530

You can subscribe online at:
jlconline.com/subscribe

Subscription rates for qualified readers:

1 year/ \$39.95; 2 years/ \$64.95.
Canada, International: add \$15/ year for surface delivery.
Sales tax will be added to total due if required by your state law.
Frequency of all magazines subject to change without notice. Double issues may be published, which count as 2 issues.

JLC BACK ISSUES

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

ARTICLE REPRINTS

For custom reprints of JLC articles, call Wright's Media, 877.652.5295; zonda@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 jlupdate.jlconline.com.

For list rentals: The Information Refinery, Brian Clotworthy, 800.529.9020, brian@info refinery.com

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

ADVERTISING SALES OFFICES

Paul Tourbaf

Executive Vice President
847.778.9863
ptourbaf@zondahome.com

Kay Ross-Baker

Vice President
630.707.0811
krossbaker@zondahome.com

John Tatusko

Vice President
617.359.8619
jtatusko@zondahome.com

Deb Capone

Strategic Account Director
646.455.8589
dcapone@zondahome.com

Mark Rosenbaum

Strategic Account Director
312.802.7002
mrosenbaum@zondahome.com

Carol Weinman

Strategic Account Director
847.778.9861
cweinman@zondahome.com

Brandy Weiss

Strategic Account Director
310.591.7770
bweiss@zondahome.com

Patrick Zazzara

Strategic Account Director
571.488.5324
pzazzara@zondahome.com

Rita Hicks

Strategic Account Manager
484.467.1187
rhicks@zondahome.com

CANADA

John Magner

York Media Services
416.598.0101
jmagner@yorkmedia.net

JLC

Content Licensing for Every Marketing Strategy



Marketing solutions fit for:

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

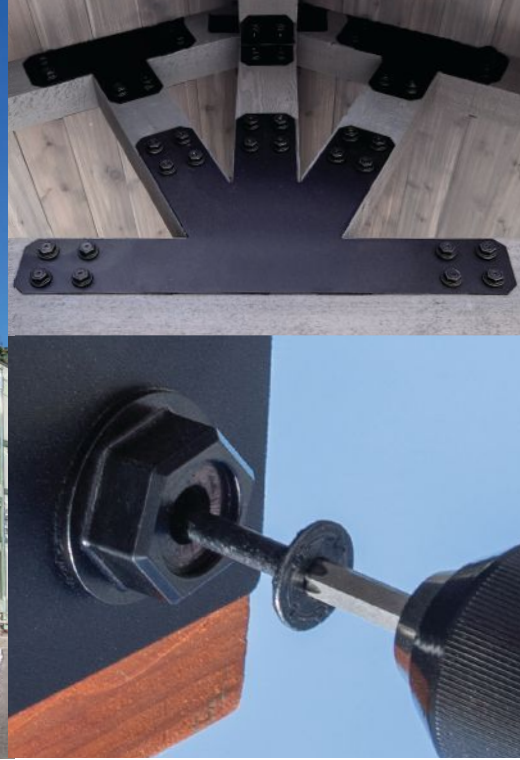
Leverage branded content from JLC to create a more powerful and sophisticated statement about your product, service, or company in your next marketing campaign. Contact Wright's Media to find out more about how we can customize your acknowledgements and recognitions to enhance your marketing strategies.

Call Wright's Media at:

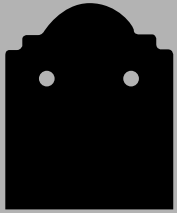
877.652.5295

Web: info.wrightsmedia.com/zonda-licensing-permissions

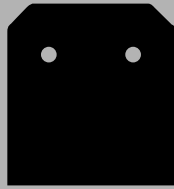
Email: zonda@wrightsmedia.com



Outdoor Accents



Mission Collection®



Avant Collection™

An outdoor style for every customer



No matter what type of outdoor structure you're building, Simpson Strong-Tie® Outdoor Accents decorative hardware provides both design elegance and structural strength. Our Mission and Avant collections offer a choice of styles, from ornate and traditional to clean and simple. Both feature an innovative hex-head washer and fastener combo with the look of a bolted connection that installs as easily as driving a screw. And whichever collection you choose, all Outdoor Accents connectors and fasteners are rigorously tested for performance — so your structure will be strong, safe and beautiful.

To see all of our Outdoor Accents decorative hardware and choose the style that's right for your client, visit go.strongtie.com/outdooraccents or call (800) 999-5099.

SIMPSON
Strong-Tie

BY BILL ROBINSON

Caulking Basics

Caulking is a fundamental part of sealing a building against water and air leaks. For a lot of folks starting out in the trades, it might be one of the first jobs they are asked to do, because it's not always a favorite task for seasoned carpenters; as a result, the right way to caulk often gets ignored. In fact, a fair share of seasoned carpenters aren't very good at it. But caulking correctly is essential, so let's embrace it and dive in.

SELECT THE RIGHT CAULK

Caulking the right way starts with using the right material. That might sound simple, but in the world of caulks, it's more important than ever. Advanced chemistry has come to construction, and we have an array of new caulks and sealants on the market today that we didn't have a decade ago (see "Selecting Caulk," Sep/20). In general, I prefer caulks with a high solids content that won't shrink as much as a caulk with more solvent. High-solids caulks tend to be more viscous (meaning they are stiffer and require more pressure to squeeze out of a caulk gun).

I encourage everyone to find a few caulks that work for the applications they are likely to do. That means reading the product literature and understanding how those few caulks behave. What temperatures can you apply them at? How quickly do they skin over?

How soon can you paint over them? What is the solvent, and how do you clean up? How runny or thick is each one, and do you have the right gun with which to apply that caulk easily? Those are some of the questions covered in the "Selecting Caulk" article cited above, and we'll touch on some of those points again here, but it's on you to do the homework and become familiar with the material. It will make your task easier and ensure a better result.

TOOLS FOR CAULKING

Two things are key: Tools don't make the craftsman, but using the right tool sure makes it easier to do a good job; and once you have the right tools, keep them clean. This is generally true for all tools, but it's particularly important for tools that come in contact with messy materials like caulk (or mastic or joint compounds and the like). The less build-up of old caulk and dirt you have on the gun and other caulking tools, the easier it will be to lay down a smooth, tightly bedded bead of caulk.

Caulk guns. Don't skimp here; buy a good caulk gun. If you are using the cheapest gun available from a big box retailer, you can still lay down a good bead, but it will be an awful lot harder and will take longer.

Your choice in gun format will largely depend on the type of



11-ounce guns (1): While basic "half-barrel" (orange) and "skeleton" guns (second from top) work, they're harder to use than professional-grade tools, which have a higher thrust ratio. The Irion-America gun (third from top) lets you switch between 12:1 and 25:1; the green Albion has a 26:1 ratio. The higher the ratio, the easier it is to apply more-viscous caulks.

20-ounce guns (2): All three "sausage" guns above are designed to hold sausage packs of sealant and have a 12:1 thrust ratio.

Photos by Bill Robinson; illustrations by Tim Healey



Tooling a caulk joint ensures it beds well against backer rod (Butt Joint illustration, top right) or against a substrate (Fillet Joint, bottom right). Almost anything with a smooth, curved edge will work. The author likes the blue plastic flashing tool shown in the photo (3). Also shown (center and right in photo) are a single spatula and spatula set, from Albion.

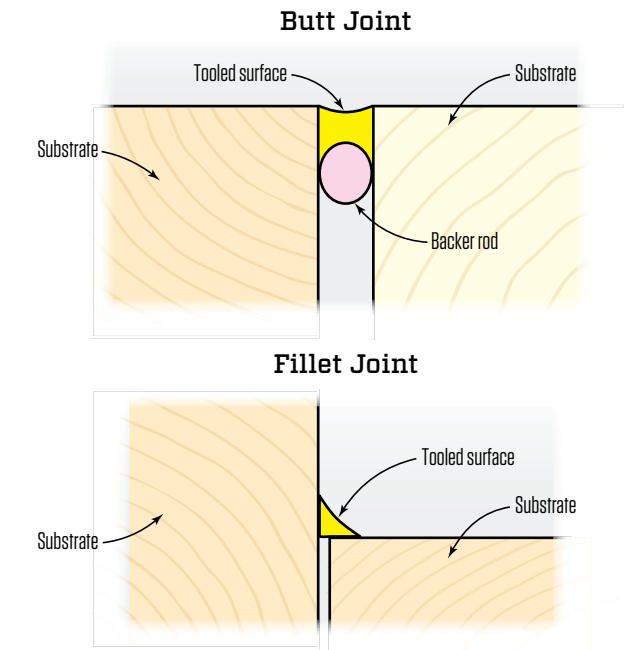
caulk you use. Most caulks for residential uses come in 11-ounce plastic or cardboard tubes, for which you can use a standard “half-barrel” gun or a “skeleton” gun. The least expensive, most ordinary guns have a half-barrel of steel to hold the caulk tube. A small step up is a skeleton gun, which has only a spare frame around the caulk tube. Also called simply “frame guns,” they tend to be lighter and easier to clean.

High-quality caulks, sealants, and liquid-applied flashing compounds often come in 20-ounce sausage packs—foil or plastic sleeves that are a bit like a package of Jimmy Dean sausage, albeit thinner and longer. To apply this type of caulk, you need a gun with an aluminum or plastic tube to hold the sausage pack. In commercial and industrial work, we also see bulk-load guns that have a canister you fill from a 5-gallon bucket of sealant, but I have never seen those on a residential job.

Thrust ratio. One of the most obvious characteristics of different types of caulks is their viscosity. Latex and silicone caulks are relatively “loose,” or thin, and tend to be easier to squeeze out. Stiffer caulks include polyurethanes and butyl. The stiffer the material, the harder it usually is to squeeze out. If you are using a thicker caulk, a gun with a higher thrust ratio will make it easier to apply. A higher-ratio gun is also good for working in colder temperatures, in which even some high-solvent caulks will be stiff.

Ordinary ratchet-style guns have a thrust ratio somewhere around 4:1 to 6:1. This means for every pound of force with which you squeeze the trigger, 4 to 6 pounds of force will be delivered at the plunger. You get some mechanical advantage, but not a lot.

As they improve in quality, guns have higher thrust ratios. Albion, Irion-America, and Newborn all offer professional-grade



guns, and most of these start at a 12:1 thrust ratio. Higher ratios—on the order of 18:1 and 26:1—are common from pro-grade makers.

Keep in mind that a higher ratio does not necessarily mean better. Most guns for applying high-quality caulks sold in sausage packs will have a 12:1 ratio. In warm temperatures, most of the liquid flashings and other sealants that come in sausage packs tend to be fairly “loose,” and a 12:1 tool works well to apply them. Using a higher ratio tool, while good for a stiff caulk, makes it harder to control the flow of thinner materials. Irion-America makes a switchable tool that goes from 12:1 to 25:1. It’s an excellent tool, and great if you are using a variety of caulks, but it’s pricey (it runs about \$85; a tool of comparable quality at either 12:1 or 26:1 will cost from \$35 to \$50).

Tools for tooling. I recommend tooling caulk joints with a tool, not your finger. But such a “tool” can be as simple as a plastic spoon (if you use a spoon, be sure to knock off any fringe of plastic on the edges that might create drag lines; you want a nice, smooth edge). The purpose of tooling is simply to press the caulk into the substrate. The goal is not necessarily to make the bead look nice (though it can do that, too); it’s to ensure the caulk is fully bedded in the joint. This gives the caulk the best chance of staying adhered to the substrate.

I prefer to use a steel spatula, like those shown in the photo above, for tooling joints. Having a set with a variety of sizes is convenient if you are doing a lot of different types of caulking with a variety of gap sizes. For example, control and isolation joints in masonry and concrete tend to be much wider than the gaps in exterior siding and trim materials. Air-sealing also presents a wide variety of joint sizes.



#1 SANDING PERFORMANCE

FOR WHEN ENDURANCE MATTERS.

This is for those who refuse to quit before the job is finished. 3M™ PRO GRADE PRECISION™ Faster Sanding Sheets resist clogging and sand faster. Fold once and the NO-SLIP GRIP™ durable backing grips together to prevent slipping, so you can sand longer with less hand fatigue. Superior cut durability — from start to finish.

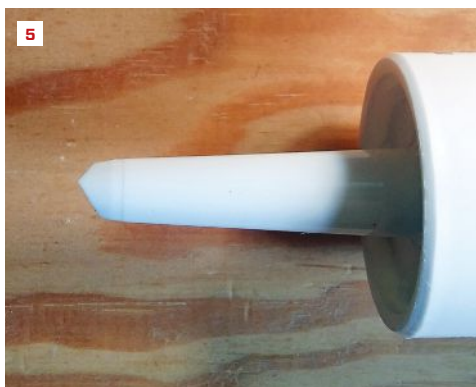
BUILT TO PERFORM

3M

© 3M 2021. All rights reserved.
3M, PRO GRADE PRECISION and
NO-SLIP GRIP are trademarks of 3M.

Find it at The Home Depot, Sherwin-Williams
or your local paint store.





Two ways to cut the tip: a square cut (4) and opposing angle cuts (5). Note that on the angled cuts, one cut is deeper than the other; they are not symmetrical. The author prefers to push the gun (6), keeping a small, raised puddle of caulk in front of the tip while he lays down an even, well-bedded bead.

GOOD CAULK JOINTS

The industry typically talks about two basic types of caulk joints—butt joints and fillets. But caulking isn't only used to fill a visible gap; it's also used in assemblies to join materials and create a watertight or airtight seal. I call this third type of joint a "smush joint."

Butt joints. The ideal butt joint has an hourglass shape with two sides that are the same size (see Butt Joint, page 6). Sealant needs to be able to stretch and shrink as the substrates expand and contract. If the caulk adheres to three sides, it will tear itself apart as the substrate materials move at differential rates.

To get that hourglass shape, we need to install backer rod that allows us to control the depth of the caulk joint (saving on caulk material) and prevent three-sided adhesion. Backer rod comes in different sizes, ranging from 1/4 inch to several inches in diameter (the larger sizes are seldom used in residential work). It also comes in different flavors—open cell, closed cell, and a hybrid that has closed or coated cells on the exterior of an open-cell core. The 100% open-cell version is the easiest to compress into a gap and the least expensive, but it can hold moisture, so I avoid it altogether and go with a closed-cell product. When installing backer rod, insert it into the gap at an even depth that is roughly half the width of the gap. Consistency is key, and having the right size backer rod (just slightly wider than the gap) makes it easy to install at an even depth. Don't push too far. I like to push it in by hand, flush with the faces of the substrates, and then use a ripped board that is narrower than the gap and has a smoothly rounded tip to push the rod in gently to the proper depth.

Fillets—caulk seals in corners between two substrates—are a different animal. In commercial work, it's common to use bond breaker tape in the very corner. When covered with caulk, the tape creates two areas of adhesion that are diametrically opposed and better able to stretch evenly when the substrates move. While good in theory, this tape isn't used in residential work, largely because no one wants to see so much sealant in corners. This means fillets tend to fail sooner and need to be applied more often.

Smush joints. A bead of caulk that will get smushed between two pieces of wood is a perfectly valid joint. However, since the caulk squeezes out when the boards are pushed together, there is a tendency to go too lean and smear the caulk on the edge. This risks gaps that will defeat the intended purpose of creating a watertight or airtight seal. I find it works best to cut a very small hole in the tip and apply a narrow but full bead, not a smear, on the edge. (With a small hole in the tip, you will need a thin wire to puncture the tube seal; I find a piece of Romex ground wire works well.) There will be squeeze-out. Fasten the boards, and then use a sharp drywall knife to scrape off the squeeze-out.

PRACTICE MAKES PERFECT

Applying caulk with no breaks and at a consistent bead size takes practice. For me, getting a consistent, well-bedded bead requires a combination of holding the tip at the right angle, having the right tip, and squeezing gradually so I get an even flow of caulk, all while pulling or pushing the gun at a steady speed. I usually need two hands to do this, and I find it works better to push the tip forward, rather than "drawing" a bead out by pulling the gun backward. But many folks can draw a bead skillfully and can do it one-handed with surprisingly consistent results. The "right" way is always the way that works best for you.

The cut on the tip of the caulk tube can make a big difference. The plastic tip on most tubes shows angled cut lines at different distances from the end, and I see most people cut open the tip along these lines. Instead, I cut the tip at two opposing angles or square to the end (see photos, above). Both methods give me a better visual on the amount of caulk coming out the end, and by holding the gun at an angle, I am able to keep a small puddle of caulk in front of the tip that I push through to create a smooth, bedded bead.

Bill Robinson is a contractor based in New Orleans, where he focuses on solving building envelope and hot/humid-climate performance issues.



FOR WHEN STRENGTH MATTERS.

3M™ HIGH STRENGTH LARGE HOLE REPAIR

Fix it, paint it and get on with the job. Makes repairs fast with no shrinking, cracking or sagging on holes up to 5". Fiber reinforced to be two times stronger*, so it holds up to your high standards. Because your work demands our best.

BUILT TO PERFORM

3M

*Compared to other vinyl spackle.

© 3M 2021. All rights reserved. 3M is a trademark of 3M.

[3M.com/WallRepair](https://www.3M.com/WallRepair)



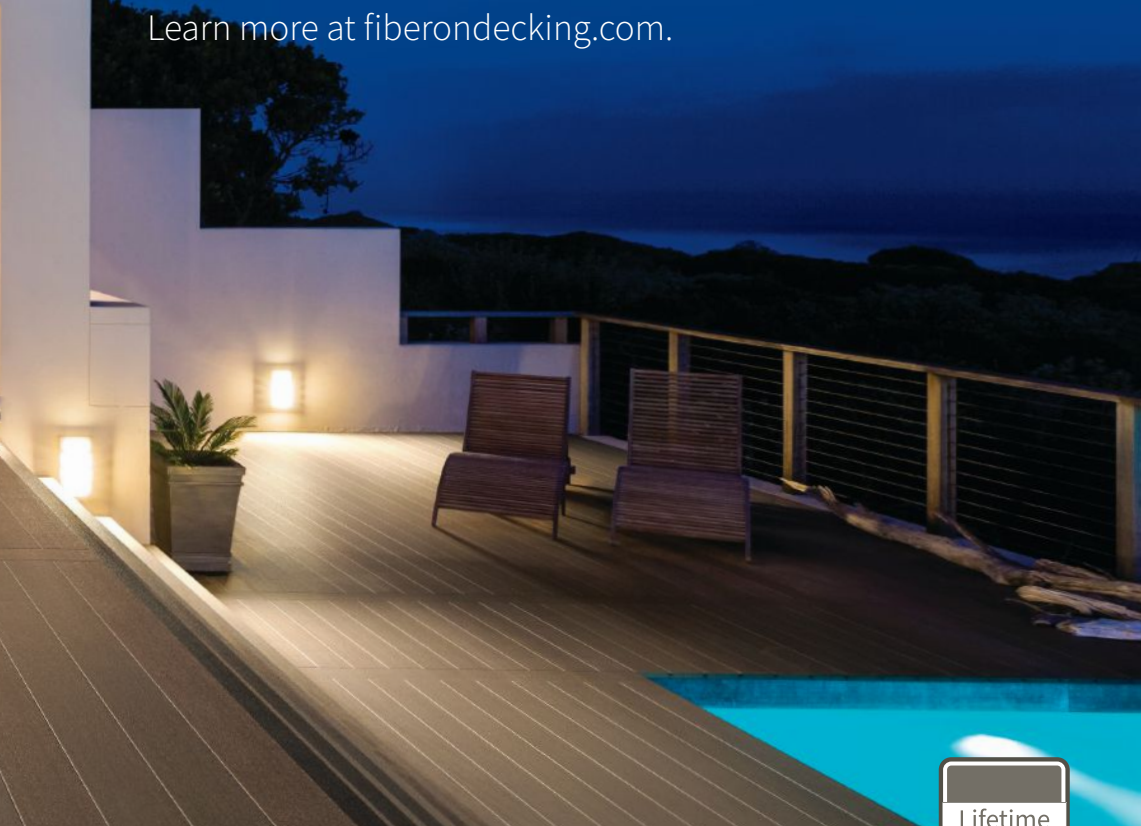


The *Art* of outdoor living.

When looks and durability are everything, why settle for anything less? With industry-leading warranties and quality beyond comparison, we've made it easier for you to offer your customers more.

Decking designed for pros, decking built by pros.

Learn more at fiberondecking.com.



Fiberon Discovery AR App



Note: See your Fiberon seller or visit www.fiberondecking.com for details on limited warranties and exclusions. Actual board colors may vary from photography.

©2020 Fiberon. All rights reserved. FIBERON and the Fiberon logo are trademarks of Fiber Composites, LLC. Registered trademarks are registered in the U.S. and may be registered internationally. Apple and the Apple logo are trademarks of Apple Inc., registered in the U.S. and other countries. App Store is a service mark of Apple Inc. Google Play and the Google Play logo are trademarks of Google, Inc.

Q When you're mitigating radon gas, is there a way to prep a house to avoid running an ugly pipe up the exterior façade?

A Josh Girard, who owns and operates North Country Construction, in Jericho, Vt., responds: In retrofit situations, it's sometimes hard to avoid using an exterior pipe, but with new construction, it's fairly easy and inexpensive to do.

I build in northwestern Vermont in Radon Zone 2 where radon levels can vary widely, even from one lot to another within the same development. The predicted average indoor radon screening levels can range from 2 to 4 picocuries per liter (pCi/L)—meaning houses have a “moderate potential” for the presence of radon gas, according to the EPA. So as a matter of course with all new construction, I rough in a dedicated radon stack in every house I build in case a house tests positive for radon.

I tie the radon stack into the under-slab drainage system from the get-go. This beats a future retrofit situation of having to core through the concrete floor and install a single pipe down into the sub-slab gravel—that approach will mitigate radon gas, but it will be far less effective than tying the stack into the drainage system.

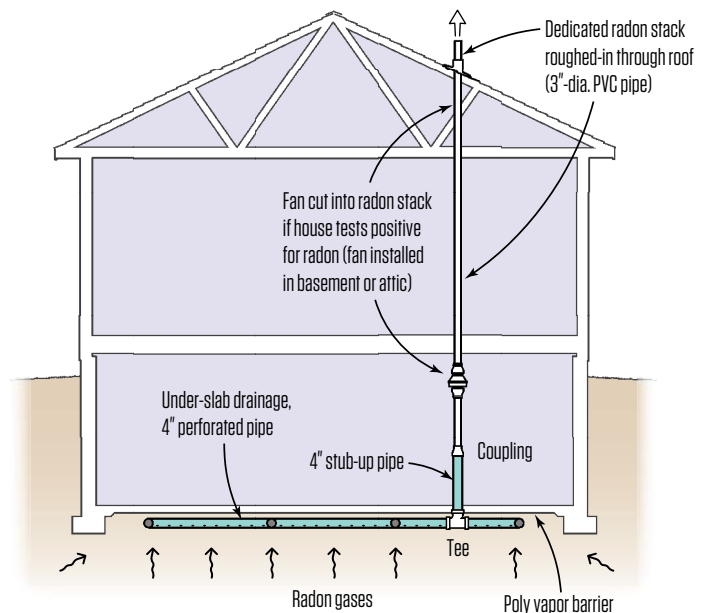
From the perforated sub-slab piping, I stub up a 4-inch piece of pipe into the basement (the poly vapor barrier is taped to the pipe and the slab is poured around it). The plumbers take it from there and reduce the pipe down to a 3-inch PVC schedule 40 vent pipe. The pipe is then typically run through the exterior wall into the attic space. From there, it's run through the roof and flashed with a standard roof vent boot.

A radon fan can be easily cut into the stack, if needed; I typically install the fans in the basement.

Although it's another roof penetration I have to account for, a dedicated stack is cheap radon-mitigation insurance. A ready-to-go remedy beats an ugly pipe run up the exterior façade every time.



Radon Stack Tied Into Under-Slab Drainage



Crew members “tee” off the under-slab drainage piping (top left) and stub-up a 4-inch pipe into the basement (top right). A 3-inch pipe is run from the basement into attic and through the roof. A radon fan is cut in, if needed (illustration).

I have a client who is concerned about the possibility of rodent damage on a newly installed mini-split system. How can you critter-proof a heat pump condenser unit?

through pretty much everything. If a customer complains about a rodent problem, we seal gaps with a combination of steel wool mixed with silicone to thwart mice; they chew into the silicone a little bit, then hit the steel wool and quickly find a different place to go.

One last note: If you have cold-climate heat pump, it should be mounted off the ground on a stand because of snow. A side benefit to a stand is it reduces the likelihood of mice intrusion.

Eric Hartman, owner of Harvestar, a home performance contractor in Lincoln, Vt., responds: In winter, when the mini-split system is in heating mode, mice have a tendency to hang out in gaps between the round insulated refrigerant lines (which are warm) and the rectangular line cover concealing them. So, it's important to close off the ends of the protective line cover.

We install Fortress line set covers to protect the refrigeration lines between the house and the outside condenser. Their end fittings are tapered and fit tightly to the refrigerant line's insulation. But mice can squeeze

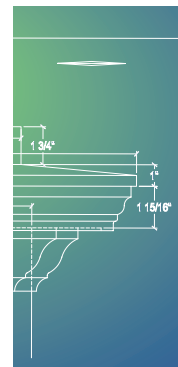


Heat pump stands, commonly installed today for cold-climate heat pumps, also reduce the likelihood of rodent damage; mice have difficulty climbing the thin factory-finished legs.

Photo: Tim Healey



- Outdoor Structures, Railings, Fences, and More
- Unmatched AZEK Expertise
- In-House Engineering
- Proprietary Seamless Profiles



BUILD OUTSIDE EXPECTATIONS

Learn more about how Walpole Outdoors can enhance and execute your work with total collaboration from concept to completion at pro.walpoleoutdoors.com | 866-461-4490

Walpole Outdoors™

NEW

TSC 55 K

Precise. Fast. Durable.



FESTOOL

The best cordless track saw now with added protection.

The world's leading Track Saw now features faster-cutting blades and electronic KickbackStop all while delivering precise, clean, finish-quality cuts.

Scan & Watch
KickbackStop



The unique kickback helps to protect your workpiece but also minimizes the risk of injury to your hands.



The combination of a brushless EC-TEC motor and dual battery system makes it impressively powerful.



New saw blade design enhances performance with up to 2x faster cuts without compromising cut quality.



Warranty all-inclusive.

3-Year Comprehensive Warranty Coverage for your Tool, Battery and Charger - including wear and tear!

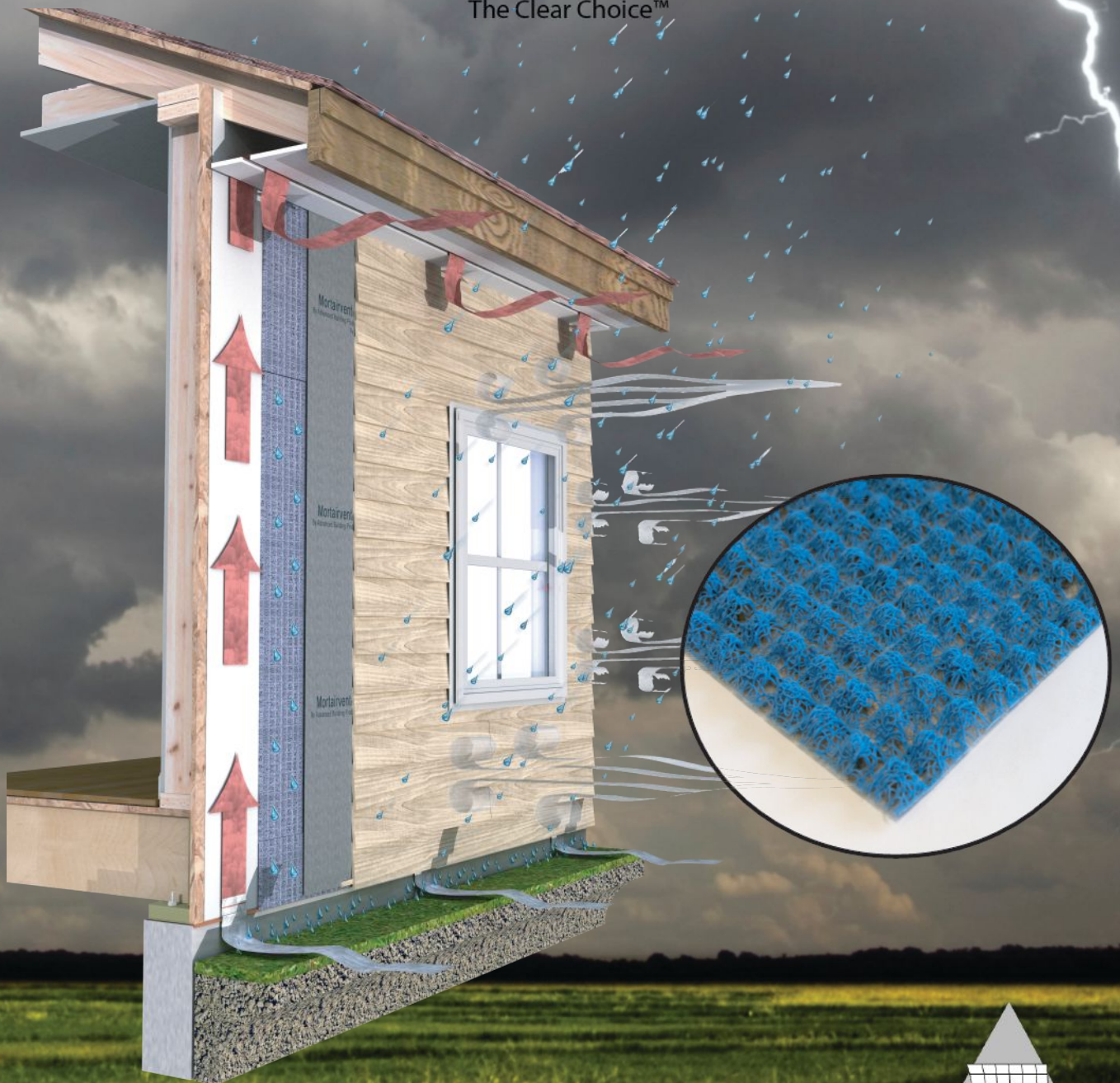
festoolusa.com



mortairvent®

Advanced Rainscreen Solutions

The Clear Choice™



**ALLOWING MOISTURE TO DRAIN,
NOT REMAIN™**
Visit www.mortairvent.com to learn more!



Air-Sealing Code Update

Early this year, in keeping with its three-year update cycle, the International Code Council published the 2021 International Energy Conservation Code (IECC), which serves as the foundation of Part 4, Chapter 11 of the International Residential Code (IRC). The new model energy code is being hailed as the most significant change in building energy-efficiency requirements since the 2012 code. (It has also been dubbed the most stringent or most progressive energy code ever, depending on your slant.) Some of the overarching provisions that caught *JLC*'s eye include:

Reflecting a warming world climate, the climate zone map has changed. Approximately 10% of U.S. counties have shifted to a warmer climate zone. The map also adds a new zone, climate zone 0, representing the hottest climates worldwide (no U.S. cities are included in this zone).

The terms “Prescriptive” and “Mandatory” have been eliminated from the section titles throughout the pages covering thermal envelope, duct installation, mechanical ventilation, and lighting measures. In addition, the word “Compliance” is replaced by “Application.” These changes, while largely semantic, follow a

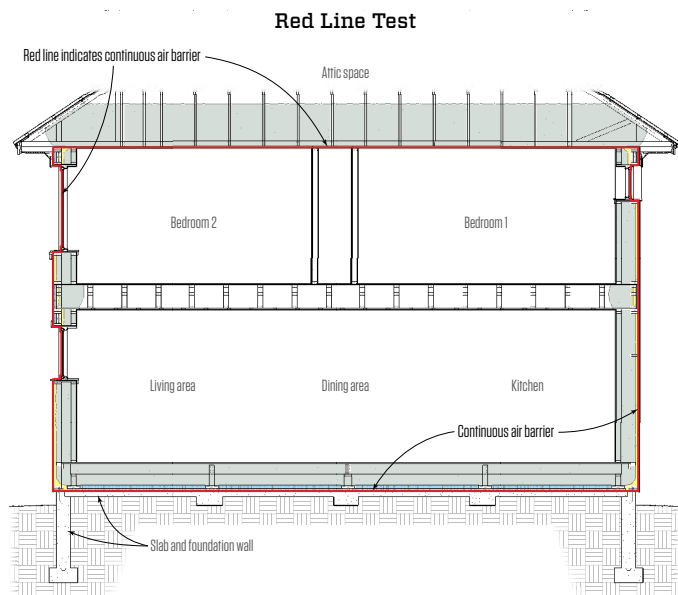
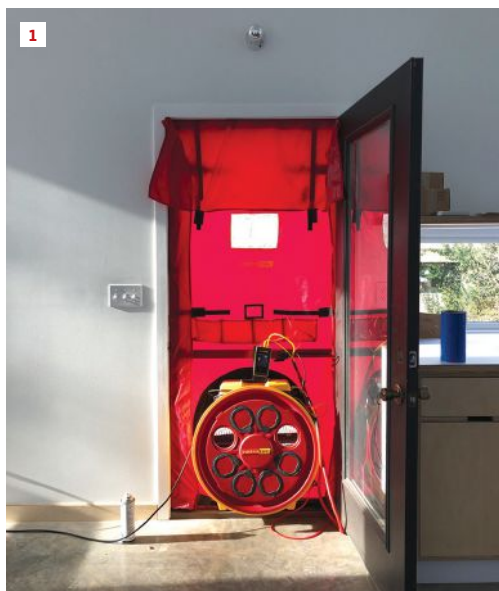
general shift toward simplifying the code's language and emphasizing that the code offers “options” that we are being guided to “apply,” rather than “mandates” we must “comply” with. (Still, the code is a collection of requirements—and the word “mandatory” has been removed only from the section titles.)

Added measures. Arguably the most radical change is that measures dubbed “additional efficiency package options” have been added on top of the base provisions, regardless of the compliance path used. Even when following the prescriptive path, you now have to add at least one package of predefined measures that upgrade insulation and glazing, heating and cooling, water heating, ducts, or air-sealing and ventilation. (We will be revisiting this change in future articles as we learn more about how it will be implemented.)

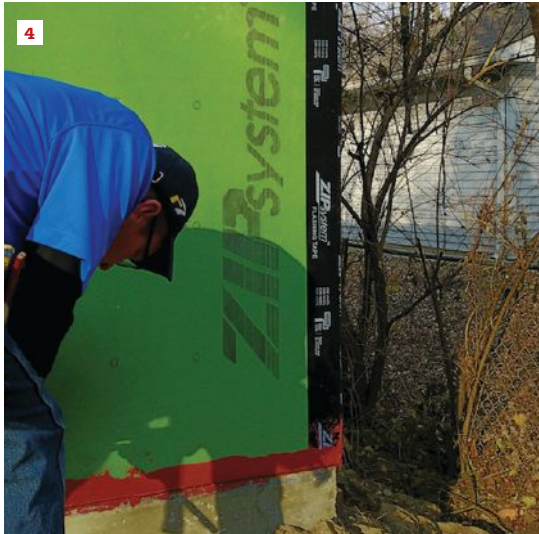
In addition to these high-level changes, a number of insulation measures also stood out as especially significant:

Insulation in the lid. In the prescriptive path, ceiling insulation levels have increased to R-49 (up from R-38) in climate zones 2 and 3 and to R-60 (up from R-49) in climate zones 4 through 8.

Continuous insulation (ci) has been added as an insulation



The 2021 IECC still requires blower door testing (1), but when a builder follows a performance option, the building can be leakier in climate zones 3-8. The new code improves the description of the air barrier, recognizing that it is not one thing, but composed of many materials—a point architect Steve Baczek makes when urging builders to define the air barrier on plans with a “red line test” (above, right) to establish continuity and show where the transition points are that will need the most attention.



Inadequate sealing at the top and bottom of the wall continues to be a major source of building leakage in many new homes. The code doesn't specify how to air-seal the top plates, allowing builders to innovate. The method employed by Steve Baczek and builder Jake Bruton is to apply a peel-and-stick to the top of the taped exterior sheathing (2), pulling it across the top plates. The inside edge (3) is picked up by the ceiling drywall, which serves as the air barrier on the lid. At the base of the wall, liquid flashing (4) or a flashing membrane (5) works to seal the bottom edge of the sheathing to the foundation. New language on sealing rim joists specifies that the air barrier must seal to the sill and to the subfloor. In this soon-to-be finished basement (6), spray foam proved an effective seal that would meet these requirements.

Photos: 2-4, Jake Bruton; 5, Matt Rinsinger; 6, Steve Eastley



The new code provides added detail on how to seal mechanical penetrations in “shafts” (or chases), with an emphasis on creating a seal that will allow for expansion and contraction as well as vibration. Fire-rated caulk around flues (7), or fire-rated foam (as this doubles as a fire stop) around insulated ducts (8) should meet the new requirements.

option in all climate zones, and fat wall insulation without continuous insulation (R-30) has been added as an option in climate zones 6 through 8, where previously only continuous insulation options were available.

Slab insulation. The new code requires R-10 (now specified as continuous insulation) to a depth of 2 feet in climate zone 3 and to a depth of 4 feet in climate zones 4 and 5. Previously, slab R-value requirements had not been increased in any climate zone since 2006.

To be clear, no state has yet adopted the 2021 version, but all the states that have adopted the IECC are actively considering it, and some municipalities are also taking up the discussion of adopting the new provisions this summer. To get out in front of any pending action, *JLC* wanted to begin exploring the changes before they hit the street, focusing first on air-sealing.

AIR-SEALING LIMITS

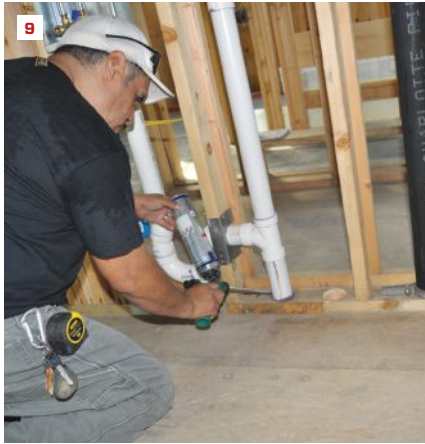
This exploration began while I was participating in an UnBuildIt podcast with Jake Bruton, owner of Aarow Building in Columbia, Mo., and architect Steve Baczek, who is based in the Boston area. Bruton had learned about the pending regulations from a summary of the code changes sent to him by HERS-rater Blake McClallen of Econsultants, based in Columbia, Mo. What caught Bruton’s eye was the air-sealing limits, which are no longer labeled “mandatory” and, most surprisingly, seem to have been downgraded. Previous limits set in the 2012 version of the IECC and continued in the 2015 and 2018 editions required 3 ACH in climate zones 3 through 8, and 5 ACH in climate zones 1 and 2. The 2021 energy code now states, “The maximum air leakage rate for any building or dwelling unit under *any compliance path* shall not exceed 5.0 air changes per hour” It was “under any compliance path” that tripped us up on a first reading. It’s not clear why that is included, as further on, the code clarifies that when complying with Section N1101.13.1

(the prescriptive option), the previous limits of 3 ACH for climate zones 3 to 8 still apply. But even with the prescriptive requirements remaining, a significant number of homes will be built leakier.

According to McClallen, in central Missouri and throughout the entire Midwestern region where Econsultants does business, fewer and fewer builders are following a prescriptive path. The majority are following the total building performance path, and a few others the Energy Rating Index (ERI) performance option, because these give them the most freedom in how they build. This is especially true with lumber prices exceedingly high and many builders seeking to show compliance with 2x4 walls.

Econsultants certifies compliance with property standards set by a number of state and local affordable housing or low-income tax credit programs, as well as certification for Energy Star, National Green Building Standards, and building code compliance. The majority of builders it is working with are *not* selling high-performance buildings. Instead, many are seeking to shave costs wherever they can to keep the building as affordable as possible. The performance path allows them to make trade-offs, usually identifying these by modeling home performance in a program like the Department of Energy’s REM/Rate that has the IECC provisions programmed in. So, for example, as you reduce wall thickness (and with it, insulation values), you need to increase other measures, like duct sealing (one of the easiest measures because it involves a limited area and it’s straightforward and inexpensive to apply mastic), or increase HVAC or water-heating efficiencies or lighting controls, or decrease window U-factors. None of these last measures, however, involves products that are much cheaper or easier to source right now.

In the end, McClallen says, it’s often easier to stick with a 2x6 wall or switch to a taped sheathing product like Zip System, which he argues is one of the easiest ways to improve airtightness, though it’s not a particularly low-cost item now either. But if by using that



Plumbing penetrations to the exterior, such as drainpipes leading into an unsealed crawlspace (9) or through slabs must now be air-sealed. All electrical penetrations to the exterior must also be sealed (10). Note that an air-seal at fireblocking height doubles as a fire stop and requires a fire-rated sealant. Electrical boxes in exterior walls must also be air-sealed. In this garage wall (11), foam is used to seal up the boxes facing the garage; note the flanged OS-4 box (center, in photo) for the kitchen-facing wall.

approach, a builder is able to go with 2x4s and less-expensive windows, tightening to a lower limit than required may still be a viable option. “We’ll see how things go,” says McClallen, who has yet to be able to play with REM/Rate with the new 2021 programming, though he’s expecting it to come out any day now.

IMPROVED BUILDING STANDARDS

If the lower airtightness limits are a small step backward, the IECC takes two steps forward with improvements to Table R402.4.1.1 (Table N1102.4.1.1 in the IRC). In particular, added to the general requirements is the statement: “Breaks or joints in the air barrier shall be sealed.” This is key, notes Steve Baczek, because it nods to the fact that the air barrier isn’t one material—a point that trips up many in the trades. Steve always urges builders to do a “red line test” by drawing a continuous red line on building sections in the plans to define the air barrier (see “Red Line Test,” page 15). This immediately shows that the air barrier can cross sheathing, framing, glass, drywall, and concrete and helps builders focus on the transitions between those materials.

Other air-sealing amendments to the table include:

Rim joists. The air-barrier installation requirements now specifically address sealing “the junctions of the rim board to the sill plate and the rim board to the subfloor.” Note that this language is specific to rim joists for first-floor wood framing over the foundation, not rim joists between floors, and not first-floor walls on slabs. Coverage of the latter is addressed in the table section on sealing walls, which continues to be worded: “The junction of the foundation and sill plate shall be sealed.” That wording remains a point of controversy because most builders frame walls on the deck and stand them up with the sheathing hanging below the bottom plate to catch the sill. To save steps, even the best builders air-seal the

foundation to the sheathing, not to the sill plate.

Shafts and penetrations includes new language for sealing utility penetrations that run through a shaft or chase. The new code specifies that these now need to be “caulked, gasketed or otherwise sealed” to allow for “expansion and contraction of materials and mechanical vibration.” This new language seems to favor flexible boots (made of fire-rated silicone if it’s a flue), though it does also allow caulk or foam. It clearly disallows unsealed metal escutcheons.

Plumbing and electrical penetrations. Previous versions of Table R402.4.1.1 had a blank cell in the air-barrier column for plumbing and electrical. The new code specifies that all holes created by “plumbing, wiring or other *obstructions* through the air barrier shall be air sealed.” The use of the word “obstructions” instead of “penetrations” is confusing. You want the air barrier to be an obstruction to airflow. What is a plumbing pipe or wire obstructing?

In addition to the updates to Table R402.4.1.1, the 2021 IECC adds a new section titled “Air-Sealed Electrical Boxes,” which requires sealing electrical and communication boxes in walls “between conditioned and unconditioned spaces.” This section specifies the air leakage limit for these boxes and names NEMA OS 4-rated (gasketed and grommeted) boxes as an alternative. Here again, there remains some gray area: If an official takes a strict interpretation of “unconditioned space,” that can draw a sharp focus on separation walls between attached garages, sheds, and other parts of the building. Or the code official could take a broad interpretation that includes the outside as “unconditioned space,” and require you to air-seal every box in an exterior wall. If so, there could be friction if your exterior-wall air barrier is at the sheathing, and you don’t want to spend the money on OS-4 boxes or the painstaking work of caulking around every box. You may need to be able to convince the official there is already an air barrier behind the electrical box. We shall see.

Photos: 9, 11, Matt Risinger; 10, Roe Osborn

INTERIOR PAINT THAT'S TOO TOUGH TO SCUFF.



BEHR ULTRA® SCUFF DEFENSE™ Interior Paint sets a new standard for paint durability. SCUFF DEFENSE features an innovative paint formula that delivers advanced burnish, scuff and mar resistance for high-traffic areas.

Available in Flat, Eggshell, Satin, and Semi-Gloss finishes.

For more information, visit [behrpro.com/scuffdefense](https://www.behrpro.com/scuffdefense)

Contact a BEHR PRO® Representative by visiting [behr.com/rep](https://www.behr.com/rep)



Exclusively at



ENGINEERED TO SHED THE EXCESS H₂O.



TYPAR

DRAINABLE WRAP

BRING ON THE ELEMENTS



MADE WITH PRIDE
IN OLD HICKORY TN.

TYPAR® Drainable Wrap™ is built on our superior, rugged, optimally breathable, weather-protecting material. Plus, it boosts your wall's ability to shed bulk water faster.

TYPARTOUGH.COM

Made in the USA. TYPAR® is a trademark of Berry Global, Inc. or one of its affiliates.



Facing Down Remodeling Stigmas

Last fall, a CNBC article authored by Sam Dogen caught my eye. The title, “Expect your home remodeling to ‘cost 50% more and take 50% longer,’ says finance expert,” intrigued me and, yes, also got under my skin.

At first glance, the title alone seemed ridiculous—why would a financial expert be casting such a dark shadow on an entire industry, one made up of many companies that are truly honest and trying to help homeowners? It’s not an accurate characterization of the whole industry, and many professional remodelers reading this right now would be happy to share any and all of their client references to prove it.

There’s no denying that remodeling and construction trades have been commoditized for decades. While choosing between a better, faster, or cheaper focus leaves most businesses crafting a “better” differentiator, many construction trades and general contractors continue to try to be either cheaper or faster, often believing that being both is the best way to secure work to feed their families. This leaves them in the position of being the lowest bidder. Low dollars get the job, and then they try to cover the potential losses by either cutting corners or adding charges.

The construction industry and buyers have perpetuated a market in which the lowest bidder sets the standard for what a job should cost, creating a misperception of what projects actually cost. This does a huge disservice to both our clientele and our industry.

That, however, is a recipe for a customer-service disaster and also a “business 101” failure; businesses that choose this strategy are why the remodeling industry is often considered the dregs of professional construction, and why articles like Sam Dogen’s get written. The construction industry and buyers have perpetuated a market in which the lowest bidder sets the standard for what a job should cost, creating a misperception of what projects actually cost. This does a huge disservice to both our clientele and our industry.

So how do we fix this? Homeowners should not simply assume that any home improvement project will cost 50% more and take

50% longer ... and good remodeling companies should be able to articulate the value they bring beyond being the cheapest. The project will always be a function of labor, materials, and what it takes to create a final product that meets a client’s expectations. That’s it. This will vary—labor that shows up when they say they will, for example, generally costs more than the lowest bidder subcontractor. A good GC will take that into consideration and communicate the value of the time and communication saved.

To shine a little more light on the value of a professional remodeler, especially in a design/build contractor scenario, below are my responses to Sam Dogen’s assertions.

IT WILL COST MORE THAN EXPECTED

Most important here is the word “expected.” Any pro remodeler should be working diligently to align expectations between the owner, designer, and builder. These should be defined early in the design process, not once a family’s home is torn apart and there is no turning back. My company’s feasibility design process is set up to define just that—the expectations of the design, costs, and timing. This happens on paper, which is much less expensive than making decisions while a project is under construction, and usually occurs within the first month of design and planning. Clarity of expectations across all parties is a process issue and should be clearly defined in the design phase.

Solution: Explain what your company does before construction begins to define the cost expectations of a project. This is a deep and process-oriented explanation that also answers the “are your projects typically over-budget” question.

IT WILL TAKE LONGER THAN EXPECTED

As with costs, clearly define the timeline with your client during the design process. We usually ask our clients if they have a date by which they would like to have the project completed and we work backward from there to show them the incredible number of things that need to be produced, decided, and executed to make that happen—if it is even possible. More often than not, an extended duration is a function of a poorly defined scope of work on the builder or designer side, which results in changes to the design, indecision, and misaligned expectations.

Dogen argues that builders bring up two classic lines that could be solved with contract language for liquidated damages. “This project is costing me money,” and “I’m practically working for free.” This is a process and communication issue on the builder side. A clearly

defined process should require approvals by certain dates by the client to keep a project on time. So many pieces of a project have extensive lead times that are out of the control of the builder if approved, changed, or added during construction. Project delays are a two-way street—we tell every client that our goals are aligned, and we too want to have a quality project completed as quickly as possible, but we need to work together with a mutual understanding of what is involved and required from the client to make that happen.

Solution: Explain your change-order process as it relates to construction, regarding both budget and timing. Our company explains that we do all that we can on the paper end of design so that everything is as clearly defined as possible and our clients are ecstatic about what is planned. We advise them that as the space is being built and they see it in real-time, they may have other ideas and we will try to be flexible, but we also warn them that changes to the original design may result in construction delays and increased costs. We offer to help guide them through the value judgments and decision-making process, should this come up.

DON'T LET EMOTIONS GET IN THE WAY

This piece of advice from Dogen gets under my skin. You, your staff, and your subcontractors are going to be working inside a client's house for months. This is a family's home—it's not a car or handbag. They are raising their children there, retiring there, or maybe starting a new life there, so how can it not be emotional? Dogen tells homeowners that they shouldn't act like they love where they live, because a contractor will be more likely to rip them off. This is clearly an issue of trust. A pro remodeler does not base business decisions on client emotions. A pro remodeler is a client advocate and consultant. A pro remodeler is helping their client understand the costs of their project and the value their company brings in realizing their goals from day one.

Solution: Explain to prospects how they can feel confident in you. Years ago, we had a client who said that they had been burned before and were nervous about trusting us. Understanding the huge financial investment they were about to make with a company they found on the internet, they were not so sure. We put photos of all of our projects on our website, so I always offer clients to find a project that aligns with theirs, and I am happy to connect them with the owners. I don't give a hand-picked reference list; I let them choose. They can pick any client we have ever worked for, and I am happy for them to talk, because I know we worked hard to earn every client's trust. For this client, I even offered up my mother's phone number, so that if at any point they felt I was being dishonest or not trustworthy, they could call her directly, and she would give me an earful on their behalf. (They never had to call her.)

SPEND WITHIN THE SCOPE OF YOUR PROPERTY VALUE

I often wonder why people can so quickly buy some expensive things knowing they will end up in the garbage or donation bin, or simply be worthless in 10 years—a \$60,000 car is worth thousands of dollars less as soon as you drive it off the lot—while with a house, they somehow assume that whatever money they put into

it, they should be able to immediately get back, plus some. Homes should be considered more than a financial investment, though; they are a quality-of-life investment. This is true now more than ever as we have had stay-at-home orders and expansive working from home during the pandemic. Home improvement is unique in that it does provide equity, but don't let a prospect's desire for an immediate return on dollars cloud the value you provide in an improved quality of life.

Remodeling is expensive, messy, exhausting, and nothing like what is seen on TV. But, it can also be a truly special and human experience. ... Few things in life can be custom crafted around an individual's needs, but remodeling is one of them.

Solution: Understand the relative property values of your prospects' neighborhoods and explain construction costs with third-party data or previous project experience. Work to understand their pain points and determine if you think it is possible to solve them within their budget, and if not, let them know. We frequently offer the Cost vs. Value report [from Zonda Media, which also owns JLC] that shows average costs of remodeling projects in our area and the average recoup value of the improvement. We also have a network of local real estate agents we can connect clients with if they need more data points to guide their improvement project.

ALWAYS THINK IN PERCENTAGES

Dogen argues that a project should be based on a percentage value of the property, and that it makes no sense to spend above what the property will be worth on the resale market. This ignores that there are other types of value besides resale value and has nothing to do with the specific context of a home and a client's needs. See above for more detail.

BWARE OF PRICING DISCRIMINATION BY NEIGHBORHOOD

In a more expensive neighborhood, levels of design and specifications are typically higher. Property values, at least in the Chicago suburbs that my company serves, also dictate a standard for finishes. For example, when designing in a lower-priced neighborhood, we would not plan a budget to include a Subzero appliance package, but there are certain neighborhoods where that is the standard. With that specification level also often come more plan modifications. Simply put, a pro remodeler doesn't change the pricing structure for specific neighborhoods but will likely increase the specification level to be comparable to the market. In higher-end neighborhoods, there are often more municipal requirements, additional bonds, tree-protection, fencing,

and portable-toilet screening, to name a few, that can also drive neighborhood costs up.

Solution: Talk to prospects about how you define a specification level for their market and see if it aligns with their expectations. If you have done other work in their neighborhood, share projects from your website and be prepared to talk about their budgets and specification levels for reference. At our company, we try to align early design and budgeting specifications with the relative local market, and we are happy to talk about similar projects and budgets.

LOWER YOUR EXPECTATIONS

This assertion makes me so sad. Dogen wrote, “Unfortunately, no matter how optimistic you are about home remodeling, you’ll likely have a miserable experience.” I wish that he had called my company before embarking on the first of his four miserable remodeling experiences.

Solution: Ask your prospects what their expectations are for the process, budget, and overall experience, and cross-reference those with your company’s standards and core values. A pro remodeler should be honest about what expectations the company can fulfill, but also leave prospects inspired by what their home can be if they’re up for it. No pain, no gain.

WHAT REMODELING REALLY IS

Remodeling is expensive, messy, exhausting, and nothing like what is seen on TV. But it can also be a truly special and human experience. It is an opportunity that a family may have only once or twice to collectively work with a team to tailor their home to them and their family. Few things in life can be custom crafted around an individual’s needs, but remodeling is one of them—and don’t forget it also affects where these individuals live—so I think that’s worth it. Expect prospects to do their due diligence and be prepared to demonstrate your value as a pro remodeler.

For prospects searching for the fastest or the cheapest, explain that the project probably won’t be either fast or cheap no matter whom they hire. If you are the best, demonstrate your value as such, and ask the questions that reinforce that your process supports the best end product and customer experience. That’s how to make remodeling vs. buying a flip worth someone’s while and improve their life. No two remodeling companies are created equal, but there are many more really good ones than worst-case media stories would lead homeowners to believe.

David Pollard, AIA, is an architect, builder, and co-founder of Liv Companies (LivCo), a full-service design-build firm serving the Greater Chicago area.

ZIPWALL®

DUST BARRIER SYSTEM

800-718-2255

Do it right.

Start every job with ZipWall®.

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

See how easy it is at zipwall.com.



WHAT CHALLENGES ARE YOU FACING TODAY?



INCREASING
CYCLE TIMES



SOFT
BUILD TIME



LOT-SPECIFIC
PLANS



ERODING MARGIN



CANCELLATIONS



MUNICIPALITIES

Let's tackle them together.

MiTek® exists to transform building. We're developing integrated, holistic building solutions for more attainable, resilient, and sustainable homes. MiTek Solutions™ save time and money, prevent costly errors before they're made, and help you and your customers deliver more jobs done right.



Learn more by visiting: [MiTek-US.com](https://www.mitek-us.com)

MiTek®

How to Size an ERV or HRV

When it comes to sizing an air conditioner, you've no doubt heard that it's a bad idea to install a system that has more capacity than the house needs. That's not true, however, when it comes to sizing an energy recovery ventilator (ERV) or heat recovery ventilator (HRV). Oversizing, in fact, can be a good thing. But we can't talk about oversizing an ERV (from here on out, I'm going to use "ERV" but it applies to HRVs, as well) without first having a reference point, a size above which the ERV might be considered oversized.

And before that, we have to talk about what "sizing" means in the context of ERVs. An ERV is one of many devices that ventilates by bringing outdoor air into a house. Because it has balanced supply and exhaust airflows and because it recovers heat (ERV and HRV) and moisture (ERV), it also happens to be the most efficient type of ventilation system for homes. When we talk about sizing any type of ventilation system, the relevant quantity is the airflow rate. That's it. How much air are you going to move through the system?

The two steps to sizing an ERV are deciding what you want the continuous ventilation rate to be and then deciding what size ERV you're going to get to provide that amount of ventilation.

VENTILATION RATES REQUIRED BY CODES AND STANDARDS

First, let's get units out of the way. In the U.S., we use cubic feet per minute (cfm) to specify airflow rates, but we can convert that into a number more meaningful for the size of the house being ventilated. When a ventilator moves an amount of air equal to the volume of the house, we say it has accomplished one air change. By factoring in the volume of the house, we can convert cubic feet per minute to air changes per hour (ACH).

The International Residential Code (IRC) ventilation requirements and the ASHRAE 62.2 residential ventilation standard are the two most common methods for setting ventilation rates in U.S. homes. Both use formulas based on the conditioned floor area of the house and the number of bedrooms. The IRC says you need 1 cfm for each 100 square feet of conditioned floor area plus 7.5 cfm per person, with the number of people defined as the number of bedrooms plus one. The current version of ASHRAE 62.2 uses the same format with one change: It uses 3 cfm per 100 square feet of floor area. ASHRAE 62.2 lets you take credit for infiltration and use a lower ventilation rate if the house gets a blower door test, but let's ignore that for this discussion. In tight houses, the ventilation credit is small, and I'm going to recommend going higher anyway.

PUTTING VENTILATION RATES INTO CONTEXT

Using those two formulas, we can calculate that a 3,000-square-foot house with three bedrooms would need 60 cfm under the IRC

rule and 120 cfm using ASHRAE 62.2. Another way to look at the ventilation rate would be in terms of airflow per person. With the four hypothetical people in this house, the IRC calls for 15 cfm per person; ASHRAE 62.2 for 30 cfm per person. For reference, recommended ventilation rates have historically ranged from a low of 4 cfm to as much as 60 cfm per person.

A third way to characterize the ventilation rate is with air



Unlike a heating and cooling system, oversizing an ERV is not a problem, and even preferred. More ventilation is often better as long as it is balanced and recovers some heat and moisture.

changes per hour. For a 3,000-square-foot, three-bedroom house that would need 60 cfm (IRC) or 120 cfm (ASHRAE 62.2), we can find the equivalent rates in air changes per hour. Assuming a 9-foot ceiling height, those ventilation rates would be 0.13 ACH (IRC) and 0.27 ACH (ASHRAE 62.2).

For our example house, we can find that the historical range of recommended ventilation rates is 0.04 ACH (4 cfm per person) to 0.53 ACH (60 cfm per person). The rate of 0.35 ACH is often mentioned in ventilation discussions as a minimum, and some ventilation designers use that as their go-to rate for continuous ventilation. On the high end, 0.5 ACH is about the limit of what's practical. These rates are summarized in the table below.

CHOOSE A VENTILATION RATE BASED ON COMMON SENSE

For most new homes, you need to follow local code or program certification requirements. Most of these requirements are considered minimums, so you can install more capacity. If you're putting an ERV into an existing home and aren't bound by any codes or program requirements, you can size it however you see fit. It makes sense, however, to size it so that it will be big enough to make a difference but not so big that you lose control of the indoor temperature and humidity. So, what's a reasonable rate to use?

The largest residential ERVs are rated at about 300 cfm or a bit more. As you can see from the table, a ventilation rate of 0.35 ACH would be 158 cfm for our example house. (I'm going to call that 160 cfm because trying to commission an ERV to ±1 cfm only leads to frustration.) It's higher than required by ASHRAE 62.2 and about half the capacity of a large ERV, two good reasons to go with this rate. (Of course, the size of the largest ERV isn't the limit. You can always install more than one unit.)

TWO REASONS TO OVERSIZE AN ERV

By looking at minimum requirements in codes and standards and

EXAMPLE VENTILATION RATES

METHOD	CFM	CFM/PERSON	ACH
IRC	60	15	0.13
ASHRAE 62.2	120	30	0.27
60 cfm/person ¹	240	60	0.53
0.35 ACH ²	158	39	0.35
0.5 ACH	225	56	0.5

1. At the high end of historical range, this rate was recommended in 1895 to reduce the spread of disease in buildings.
 2. Limit established by the ASHRAE 62-1989 committee, which established 0.35 ACH but no less than 15 cfm/person as the appropriate minimum ventilation rate for dwellings.

This table shows a range of recommended ventilation rates for a 3,000-square-foot, three-bedroom house with a 9-foot ceiling height. The highlighted rates establish the way each is commonly cited. The last line establishes the upper range of what is practical to provide.

available ERV capacities, we chose a continuous ventilation rate of 0.35 ACH, or 160 cfm, for our example house. Once we have an ERV that can give us the continuous ventilation we want, we can always turn it down if we decide it's too much. The good thing about turning it down is that fans are more efficient when they run at lower speed.

And that's reason number one to oversize an ERV. If you want to be able to supply 200 cfm of ventilation to the house, get an ERV that can move 300 cfm or more. What you don't want to do is get one rated at 200 cfm and run it at maximum capacity all the time. That's less efficient, and it interferes with reason number two.

Reason number two to choose an ERV larger than your continuous ventilation rate is so that you can boost it to a higher rate. If you're setting up the ERV to exhaust from bathrooms and a kitchen, you'll need one with a boost mode. Likewise, if you're having a party or have a sick person at home, boost gives you more fresh air when you need it. And that means you need an ERV with a capacity higher than your continuous ventilation rate. You can't boost when you're already running flat out on the highest speed.

Is it possible to overventilate a house? You certainly can cause humidity problems (too dry in winter, too humid in summer) with ventilation air. You can create comfort problems and high energy bills. You could even damage a house by sucking moisture into places where you don't want it, although the risk of that is drastically reduced with a balanced system that is neither negatively pressurizing nor positively pressurizing the indoor space. That's why you should use an ERV instead of using exhaust-only or supply-only ventilation. (Make sure to get one with high recovery efficiency and electronically commutated motors for the fans, too.) More fresh air is better for health. It reduces the effects of hay fever and asthma and reduces the concentrations of indoor pollutants. You don't want to skimp on indoor air quality, so don't skimp on the ventilation system.

ADVICE FOR BUYING AN ERV

When you buy an ERV for a house, look for these features to get a unit that should serve you well:

- A maximum rate about twice as high as you plan to run it continuously.
- The capability of changing the rate so you can run it at a lower rate.
- The capability to boost to a higher rate when you need more ventilation.
- Electronically commutated motors.
- A core with a high recovery efficiency for heat (ERV and HRV) and moisture (ERV). The best units offer around 95% and 70%, respectively.

Make sure you look at the specifications of the models you're considering. There are plenty of low-cost, low-quality ERVs available.

Allison A. Bailes III, Ph.D., author of the Energy Vanguard blog (a must-read for the energy-minded) owns Energy Vanguard, a residential building science firm in Decatur, Ga., that does HVAC design across North America.



WHEN YOU'RE BUILDING TO THE **ZIP** CODE,
IT'S A DIFFERENT WORLD ENTIRELY.

We make the right products to do the right job, the right way, the first time. No matter what the region or climate, you can count on ZIP System® building enclosures to streamline the performance of your air, water and thermal barriers for structural assemblies. Is your project Built to the ZIP Code™? See why others have made the switch at ZIPSystem.com.
#BuiltToTheZIPCode



ZIPsystem™
BUILDING ENCLOSURES



REBAR DEMON™

NEW! **4-Cutter**
FULL CARBIDE HEAD
HAMMER DRILL BITS

TAKES the HEAT!


UP TO
7X
LONGER LIFE
IN CONCRETE &
REINFORCED CONCRETE

The Industry's Most Durable, Fastest & Coolest
Full Range of SDS-Max® & SDS-Plus® Hammer Drill Bits
Available in 75 Sizes Ranging From 5/32"-2"

Impact Resistant 4-Cutter Full Carbide Head Design

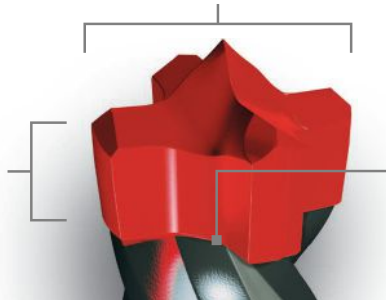
4-Cutter full carbide head extracts smaller bites of rebar for controlled, consistent carbide wear and reduced vibration, delivering **FAST, PRECISE HOLES AND LONGER LIFE**

DIABLO MADE **DURA CARBIDE™**



Up to **2x MORE DURA-CARBIDE™** withstands up to 1800°F of intense heat to combat rebar hits versus standard bits that fail at 800°F

DIABLO REBAR DEMON vs **STD. 2-CUTTER BRAZED**



Tri-Metal Fusion Welding



Up to **3x STRONGER WELD*** keeps full carbide head intact during extreme impact such as rebar

*vs. standard 2-cutter brazed hammer bits

Learn More at TakesTheHeat.com



TakesTheHeat.com



@DiabloTools



@DiabloTools



@DiabloTools



@Diablo_Tools



@Diablo_Tools

BY MIKE WHALEN

Managing Asbestos During a Remodel



“Before” image of the kitchen in the client’s late-1950s Cape-style home (1). Work stopped when vermiculite was found in the ceiling; the author quickly sealed off the demo hole and around a ceiling light after its discovery (2). A temporary 2-by wall was framed in the middle of an archway to isolate the kitchen and to allow access to the bathroom, bedrooms, and basement (3).

I’m a project manager for DBS Remodel, a residential remodeling company based in Poughkeepsie, N.Y. A few months ago, in the midst of remodeling a kitchen, we came across what we believed to be vermiculite insulation above the room’s plaster ceiling. Upon discovery, we quickly sealed up the ceiling with tape and plastic and notified the homeowners. Our clients had chosen to remain in their late-1950s Cape-style home during the remodel, so we felt a sense of urgency when reaching out to asbestos abatement companies to confirm our find.

Kevin Mathisen of Lucas Environmental Services out of Kingston, N.Y., made a jobsite visit and verified that the light granular insulation was vermiculite. He noted that while it may or may not contain asbestos, a substantial amount of vermiculite that had been sold throughout the U.S. under the trade name “Zonolite” contained varying amounts of asbestos. As a result, New York state regulations assume vermiculite to be an asbestos-containing material.

Size matters. Our client’s kitchen was 150 square feet and Mathisen explained that New York state defines any work under 160 square feet as a “small” abatement project (square footage is used to estimate asbestos-tainted materials like floor tile or vermiculite,

while linear footage is used for materials like pipe insulation). For abatement projects, square footage is one of various regulatory thresholds that impact the scope of the asbestos mitigation work. Even “small” projects require the rigors of a licensed abatement contractor setting up a containment area, removing the asbestos, and demobilizing the work area. In addition, baseline air testing, visual inspection of the containment, visual inspection of the completed removal area, and collection of final air samples must be conducted by a third-party air monitoring firm to avoid conflict of interest. See “Mobilizing for a Small Abatement Project” on pages 30 and 31.

The estimate was \$6,400 for the abatement work and an additional \$800 for monitoring-supervising services. While the homeowners noted that neighbors up the road had just renovated a home similar in style and vintage to theirs and didn’t have an asbestos abatement, our clients quickly came to appreciate the steps we took to bring Lucas on board and that the vermiculite would be removed properly, even though it would add to the project’s cost.

The abatement. The separation wall between the kitchen and the rest of the living area had to be beefier than a standard ZipWall dust barrier, so I framed a temporary wall out of 2-bys—on which



A double layer of 6-mil poly is installed on the framed wall by the abatement contractor (4). A third-party air monitoring firm sets up equipment to take a baseline air test (5). Warning signage is placed at the entrance of the containment area (6). Two layers of 6-mil reinforced fire-retardant poly, with seams sealed, cover floors, walls, and non-abatement surfaces.

Lucas later installed a double layer of woven reinforced plastic—in the middle of an open archway. This gave the clients access to their bathroom and bedroom areas. Once the third-party monitor, JPM Environmental Solutions, out of Newburgh, N.Y., had conducted baseline air testing, Lucas set up its containment shell and warning signage and cordoned off outdoor work areas. Wearing Tyvek suits, respirators, and gloves, workers wetted down the vermiculite with sprayers and bagged up the material, sealing the heavy-mil bags with duct tape. The bags were brought out to their box truck and later transported to their shop.

JPM Environmental then inspected the abatement work and gave the OK, and the abatement crew HEPA vacuumed and wet-wiped the work area. Once it was clean, JPM conducted another visual inspection, and upon its approval, the Lucas crew exited the work area via a three-chambered decontamination/waste-out system, which consisted of a changing room, a shower room, and an equipment room. A post-abatement settling period began, to allow the room to dry and the air to settle. A couple of days later, JPM Environmental returned to conduct its final air check to verify the amount of fibers in the air was below the legal limit.

Given the all clear by JPM, the abatement crew returned and broke down the work area, disposing of the poly sheeting in asbestos waste bags. The abatement process came to an end, and after four business days, we resumed remodeling the kitchen.

Mike Whalen is a project manager at DBS Remodel, a design-build residential remodeling company based in Poughkeepsie, N.Y.

MOBILIZING FOR A SMALL ABATEMENT PROJECT

I've been doing asbestos abatement work in New York state for 16 years. The following is a brief summary of the typical procedure we follow when removing asbestos-contaminated friable waste from a "small" project (less than 160 square feet of asbestos material) as defined by the New York State Department of Labor (NYS DOL).

1. A licensed air monitoring firm is contracted to conduct material testing and air monitoring and may act as the abatement contractor supervisor.
2. A licensed abatement contractor is hired to complete the removal project.
3. A paper building occupant notice is placed on entrance doors three days prior to the project's start.
4. The third-party air monitoring firm collects background air sampling to establish a baseline.
5. The abatement firm mobilizes the project and installs a fully functional decontamination/waste-out system stocked with PPE equipment and cleaning materials. The area is demarcated with "danger asbestos" barrier tapes and signage.
6. The work area is prepped, which includes installing



The enclosed hall shown here will be fitted out with a three-chambered decontamination/waste-out system consisting of a changing room, a shower room, and an equipment room (7). A 1,800-cfm HEPA-filtered air scrubber (8) exhausts to an exterior area that is fenced in with orange temp fencing and posted with warning signage and barrier tapes (9).

two layers of 6-mil poly at all openings, light fixtures, and outlets within the space. Floors, walls, and non-abatement surfaces are covered with two layers of 6-mil reinforced fire-retardant poly (seams are overlapped and sealed using T-50 staples, spray adhesive, and poly tape to ensure the containment is airtight). HEPA-filtered negative air scrubbers are installed and exhausted to an exterior area that is fenced in with orange temp fencing and demarcated with "danger asbestos" signage and barrier tapes.

7. A pre-abatement waiting period is observed to ensure the containment remains intact while under negative pressure.
8. For the abatement, workers don Tyvek suits, half-face respirators, and gloves and enter the work area to remove the asbestos material using "wet methods" (an airless sprayer is used to wet the material down during bulk removal—NYS DOL explicitly prohibits dry removal). The removed material is immediately placed into 6-mil asbestos waste bags that are then sealed using duct tape. Once bulk removal is complete, all removed material is bagged, cleaned, and placed into a second 6-mil asbestos waste bag. That bag is sealed and labeled with a generator label showing both abatement contractor and homeowner information and then

removed from the work area (the waste is later placed into a properly lined waste container before being transported to an approved waste disposal facility). The work area is then HEPA vacuumed and wet-wiped. Once it's considered clean, the contractor supervisor conducts a visual inspection; if acceptable, the workers decontaminate out of the work area and a post-abatement drying and settling period is observed.

9. The third-party air monitoring firm returns to inspect the work area, and if it's found acceptable, the firm collects final air clearances and those samples are sent to a testing lab.
10. Once air-sample results are returned and pass the sampling criteria, the abatement crew can return and demobilize the work area. All polyethylene sheeting is carefully dismantled and placed into asbestos waste bags in the same manner as the asbestos waste, as it's considered part of the project's waste. Once the containment is removed, the decontamination/waste-out system along with the barrier tapes and signage can be removed from the site. Project is demobilized and considered complete.

Kevin Mathisen owns and operates Lucas Environmental Services, in Kingston, N.Y.



COST^{vs}VALUE²⁰²¹

Better curb appeal, **better ROI**

- **94%** ROI on garage door replacement
- **92%** return on manufactured stone veneer
- **72%** ROI for minor kitchen remodel

See full 2021 Cost vs Value report
at costvsvalue.com

Sponsored by:



ROOFING



Slate Roof Restoration

As a long-term solution, slate proved more cost effective than an asphalt reroof

BY T JEFF SPENCER

I own and operate a small roofing company, Stewardship Slate, which specializes in the restoration and repair of slate roofs. In January, I was contacted by a rental property owner seeking my assessment of a slate roof in Burlington, Vt. She had recently purchased the 120-year-old house from the estate of an elderly homeowner who, after living in the home for decades, allowed the two-story structure to gradually slip into disrepair. The new owner wanted to keep the slate roof, but numerous contractors told her it needed to be replaced.

Upon inspection, I noticed the roof was in rough shape. Most of the existing terne metal flashings were corroded, and it had numer-

ous broken and missing slates. There was evidence of some dubious repair work done over the years and a fair amount of the historical trim along the eaves was rotted, with most of the corners chewed open by squirrels. Yet, with all wear and tear taken into account, I believed the roof was worth restoring given the life expectancy of the undamaged slate, which I estimated at approximately 75 years. The owner was pleasantly surprised by my quote and jumped at it (she later divulged that my estimate to restore the roof was a third of the lowest quote she received to re-slate the roof and comparable to the quote she received to reroof with architectural asphalt shingles—a 25- to 30-year roof).

Photos by T. Jeff Spencer and Tim Healey, except photo (13), by Sam Simon. Imaging

SLATE ROOF RESTORATION



The author “sounds” a slate to make sure it’s intact **(1)**; he rejects 10% to 15% of the salvaged slate he buys. Standard slate tools include (clockwise from top in photo) standard mounted slate cutter; traditional slate hammer; restoration slate hammer; slate ripper; and hand-held slate cutters **(2)**. ANSI-rated Jorestech rock-climbing-style helmets are worn at all times **(3)**.



The existing terne metal flashings have done their time and need to be replaced **(4)**. On north-facing roof sections and areas shaded by trees, discoloration from mildew and lichen is common. Roofs can be hand-scrubbed clean with a mildewcide like D/2 Biological Solution (d2bio.com).

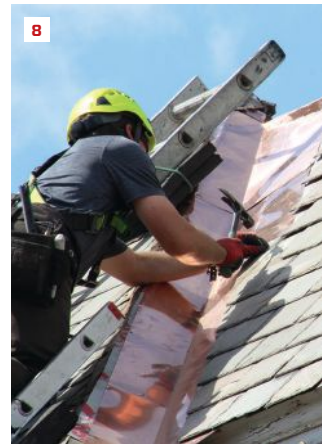
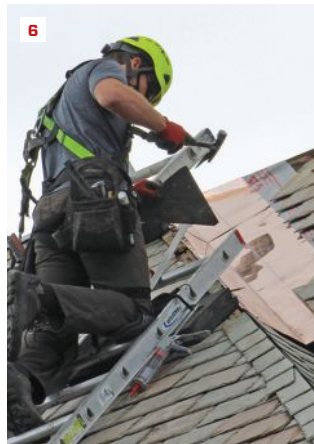
SLATE IN THE CITY

We work primarily in the downtown area of Burlington, Vt., where the majority of the homes are roofed with semi-weathering green-gray (or sea-green) slate quarried in the southern portion of the state. To maintain the character of the city, Burlington requires homeowners who want to replace a slate roof with asphalt to go through zoning and show that the cost difference to restore the slate would create economic hardship. Fortunately for us, most homeowners choose the restoration route.

While we do install some standing-seam and fluid-applied roofing, 90% of our work is restoring existing slate roofs, with the occasional new slate roof thrown into the mix. There are few skilled slaters in our area and demand for this niche restoration work is high, so we’ve managed to stay continuously busy over the years, repairing more than 300 roofs since 2010.

Slate repair in city neighborhoods requires having patience, working at a careful pace, and being mindful of where you, your crew members, and any bystanders below are at all times. It can be hazardous at times working high up on late 19th-century roofs on which roof framing is often “bouncy” (especially on rakes) and slates can break easily. When we work, we wear ANSI-rated rock-climbing-style helmets (technopackcorp.com) and safety harnesses clipped to self-retracting lifelines (falltech.com) or ropes at all times. We take time to set anchor points, secure ladders, and cordon off work areas we are concerned about with caution tape (housing in the city is often close together and falling shards of slate is commonplace). We typically have to access roofs from both the client’s and their abutting neighbor’s driveways, so we have to work around their comings and goings—moving ladders, magnet sweeping, and broom cleaning driveways often a few times a day.

Replacement slate. We use salvaged slate for restoration work because it’s thinner than newly quarried slate and therefore easier to



Replacement slate is trimmed along the angled valley line with a hand-held slate cutter (5). A restoration slate hammer (6) is used to punch a nail hole in the trimmed-up replacement slate (7). Nailed into place with the restoration hammer, the slate overlaps the valley flashing 5 inches, leaving 4 inches of exposed copper (8).

slide under existing slates. Also, newly quarried slate doesn't color-match well with existing, weathered slate. New semi-weathering green-gray slate starts out uniformly sea green, then gradually weathers to a mosaic of colors such as gray, blue, and pink (slates that "weather" to pink have a higher ferrous mineral content). The irony is never lost on us, though, that we rely on people taking entire slate roofs off houses and barns as part of our supply chain.

Tools. Our primary tools are slate hammers, slate rippers, and slate cutters. We use two types of slate hammers. For installation work, we use a traditional slate hammer, which has a sharpened upper edge on the handle for cutting slate and a punch for making nail holes through the slate for fastening. For beating on slate rippers and reinstalling slate and flashing, we use a restoration slate hammer, which is similar to a traditional hammer but heavier.

To cut slate, we use a mounted slate cutter or bench cutter and hand-held slate cutters; occasionally, to cut thicker, new slate, we use powered shears that attach to a drill (malcoproducts.com). Bench cutters offer more leverage and cut slate more easily, while hand cutters offer convenience for tricky tasks in hard-to-access areas, such as valley restoration work. We buy most of our slate-specific tools from Slate Roof Warehouse (slateroofwarehouse.com) and John Stortz and Son (stortz.com), both based in Pennsylvania.

SLATE RESTORATION

A typical full-restoration project includes pulling off existing slates to access and replace the worn metal flashings with new ones—typically 20-ounce copper in the valleys and 16-ounce copper everywhere else. We check all the slate on the roof and replace missing, cracked, and disintegrating "shingles." We encounter many bad repairs where the wrong-size slates were used or the slater broke slates when installing replacement pieces. A common mistake we fix is where someone face-nailed a patched-in slate



New valley flashing is installed over ice barrier membrane (9). The roof had six valleys, three close to hips. Here, slate is cut from the back with a mounted slate cutter (10).



The shingled walls of the hip roof's dormers are stripped to make way for new step and apron flashing (11). Copper slate hooks (shown here in red circle) secure replacement slates along the roof-to-wall perimeter (12). A 15-lb. felt building paper weather-resistive barrier was installed, then the slate crew shingled the sidewalls (13).



A crew member slides a ripper under a slate to help slide the slate out (14). A salvaged replacement slate is slid into place and later secured with a slate hook (15).

and did not cover then nail with bib flashing. In the end, we leave approximately 75% of the existing slates intact, though that percentage can vary depending on the condition of the roof.

Some carpentry is usually involved in restoration work. Repairing damaged trim and roof decking is commonplace, as well as re-siding dormer walls to install new step and apron flashing.

Open valleys. We began this restoration project by pulling slates from the edge of an open valley on the east-facing dormer (the home's hip roof had three dormers with a total of six valleys). What remained of the roof's original rosin paper "underlayment" quickly disintegrated, exposing the board-sheathed roof deck, which was in surprisingly good shape given the condition of the existing slate and flashing. For the new V-shaped valley flashing, we bent lengths of 18-inch-wide sheets of copper with a brake in our shop. (On each side of the valley centerline, we planned for 4 inches of exposed copper and 5 inches under the replacement slates.)

On new-slate installations, we always apply ice barrier membrane in the valleys and at the eaves and integrate roof underlayment with the peel-and-stick. While we feel obliged to install ice barrier membrane on restoration work, it's something we've wrestled with over the years. Joseph C. Jenkins, the author of *The Slate Roof Bible*, advises not to use peel-and-stick membrane on slate roofs because the slate has the potential to stick to the ice barrier membrane, making future repairs difficult. We have installed felt paper between the peel-and-stick and the metal flashing on past projects for this reason. But here we used Titanium PSU30—an ice barrier membrane with a slip-resistant surface (owenscorning.com). We ran a 30-inch-wide strip up the valley, tucking it under the staggered pattern of the existing slate. We then installed the new V-shaped valley flashing and fastened the edges with stainless steel roofing nails.

When installing replacement slate in a valley, we try not to nail through the copper flashing, but sometimes it's hard to avoid



It used to be common to install “mitered” cap slate at hips (and ridges) without step flashing, but it tends to spread apart over time (16). The “mitered” slate wasn’t cut at 45 degrees, but at 90 degrees, and was joined at the sharp edges of the back surface. A cost-effective solution is to remove the existing hip (and ridge) slate (17) and install new copper cap flashing (18).

with smaller slates. Our rule of thumb is to keep the nail no more than an inch from the edge of the copper flashing—in this case, an 8-inch “no-nail zone” from the center of the valley. We strike a line up the valley representing the 5-inch slate overlap, then begin the time-consuming task of slating the restored valley.

Replacing damaged slate. We remove a damaged slate by first sliding the flat end of the ripper under the slate and pushing it up until the hooked end is above the nail. We pull it sideways and down to hook the nail in the notch of the ripper, and with a few hammer taps downward on the ripper’s handle, the nail loosens. Most slates are fastened with two nails, so we repeat for the other nail. We slide the ripper back under the slate, press down on the top of the slate with our free hand—sandwiching the slate between our hand and the tool—and pull down on the ripper to slide the slate out. We then slide a salvaged replacement slate in its place.

There are two ways to fasten a replacement slate. One way is to punch a nail hole in the new slate between the edges of the slates above, midway up the joint. We slightly pry apart the overlaying slates above, just enough to drive the new nail between them. Unlike other materials, slate has to be nailed loosely; it is important to leave the head of the nail just flush with the face of the slate, so that the slate “hangs” on the nail. If the slate is nailed too tightly, it will break under the stress. If the nail sits too high, it can poke through or break the slate that lies on top of it. We cut a 4-inch-wide piece of copper or aluminum coil stock to make a “bib” long enough to reach the top of the new slate and cover the nail by approximately 2 inches. Before sliding the flashing into place, we bend the top up and the bottom down a little bit, creating a slight “S” shape to help it pass over the nail and stay in place.

Our preferred method to replace damaged slate is to use slate hooks instead of nails. That way, we don’t have to punch nail holes and risk breaking slates or worry about bibs sliding out over time. We drive the pointed end of the hook into the roof deck, leaving



Galvanized-steel snow belt is replaced with copper panels along roof eaves (19). Ice barrier membrane is installed on the deck, then a layer of felt paper to thwart the replacement slates from potentially sticking to the membrane.

SLATE ROOF RESTORATION



Copper snow guards (inset photo) applied on the north side of the roof will help keep ice from falling into the neighbor's driveway below (20).



Salvaged semi-weathering green-gray slate blends into the existing slate on a finished open valley (21), dormer (22), and north- and west-facing sections of roof (23). Seventy-five percent of the existing slates were left intact.

the crook of the hook in line with the bottom of the replacement slate. The replacement slate is pushed into place over the hook, then pulled down to rest on it. (For more on slate replacement, see “Repairing Slate Roofs,” Dec/03).

Fastener lifespan and length. We match the relative life expectancies of the slate roof and the fasteners when selecting nails. For this restoration, where the roof should last roughly 75 years, we used 1½-inch hot-dipped galvanized roofing nails to secure the field slate. On new-slate installations that should last 100 or more years, we use 1½-inch stainless steel nails. It’s a common misconception that slate has to be fastened with copper nails. Virtually none of the roofs in this area were originally installed with copper nails. In fact, many of them were installed with non-galvanized steel cut nails, since they were installed during the industry transition to the modern wire nails used today.

In addition, it’s fairly common in Burlington to come across slate applied directly over cedar shakes; slate was marketed as the “fireproof roof” at the beginning of the 20th century. We use longer roofing nails and modify the copper slate hooks to ensure that the slate is fastened to the sheathing and not just the cedar shake.

Hips and ridges. If the roof had an Achilles’ heel, it might be the detailing of the slate hips and ridges. During the height of slate’s use as a roofing material, it was common to install “mitered” slate at hips and ridges without step flashing; I believe the thinking back then was that any water that happened to find its way into the unfinished attic would eventually dry out. Mitered cap slate tends to spread apart over time and open up to the elements.

Rebuilding slate hips and ridges with step flashing tends to be expensive and time-consuming. To help lower the costs, we removed the existing hip and ridge slate and installed copper cap flashing (bent from a 12-inch-wide strip of 16-ounce copper and hemmed ¾ inch at the edges). We secured the flashing with stainless-steel gasketed screws driven through the slate below and into the deck and hip framing.

Snow belt and snow guards. On homes of this vintage, snow belts were often retrofit on roofs to address ice damming. Along the south-facing eaves on this project, we replaced a poorly installed, rusting galvanized-steel snow belt with copper. We first applied ice barrier membrane, then a layer of felt paper to thwart the replacement slates from potentially sticking to it. We fabricated the copper snow-belt panels in the shop, then installed them on site, joining the seams together with rubber mallets and hand seamers. On the north side of the roof, we installed Alpine SnowGuards’ PD10 pad-style snow guards (alpinenowguards.com) to keep snow and ice from falling into the neighbor’s driveway.

Finishing up. We take great pride in this project and leave with the satisfaction of knowing that the house would likely have gone through three asphalt roofs before the restored slate will wear out, which represents a significant reduction in the building’s carbon footprint.

T Jeff Spencer owns and operates Stewardship Slate, a slate roof restoration company, in Burlington, Vt.

INTRODUCING *NEW* KILZ® DRYWALL

AVAILABLE AT 



When it comes to properly prepping new drywall for paint, you want a primer specially formulated for the job. KILZ® DRYWALL Primer is a fast drying, water-based interior primer that seals uncoated drywall, reducing the number of topcoats required to achieve a uniform, professional-quality finish. Designed for use with flat and low sheen paints.

KILZ®
EVERY PROJECT IS WORTH IT.



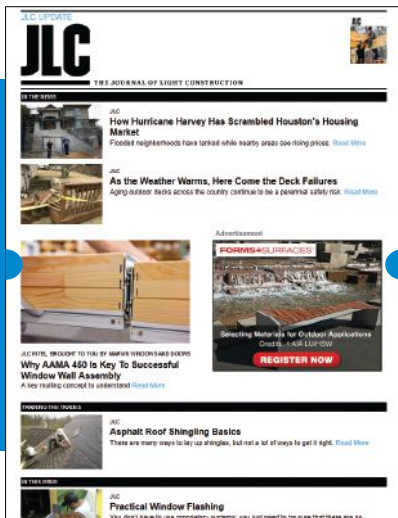
Put Productivity
**IN THE PALM
 OF YOUR HANDS**
**TOUGH.
 DURABLE.
 LONG-LASTING.**

The World's Best Sandpaper
 Just Got Better.

GET IT. FINISHED.™
www.nortonabrasives.com



© Saint-Gobain June 2021.



JLC Update the source for information to help pros improve job performance—including hands-on job tips about the best materials and techniques, industry news and product trends. Sign up now at jlonline.com.



EXTERIORS



Gables of Waves

A custom wave pattern in cedar shingles complements the gable ends of seaside homes

BY MIKE GUERTIN

The first time I watched a crew shingle a wave, they cut and fastened the shingles one at a time. I knew there had to be a faster and easier way, so instead of fighting gravity and marking and cutting shingles individually, I turned the process into a production operation from shingle layout to installation.

The key step that keeps the processes of marking, cutting, and installation simple is collating the shingles into strips that are 3 to 4 feet long. This is done by gluing thin cardboard drywall shims near the top of the shingles to join them together. Handling the strips is easier than fumbling with a bunch of small, loose shingles, and being able to use a basic template to mark the cut lines keeps the wave contours consistent. As every efficient carpenter knows, when you have to repeat a step more than three times, it's worth setting up a jig

and a process. Not only does the job go faster, but the work is uniform.

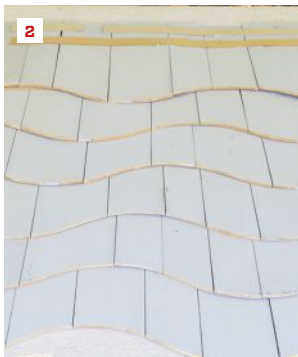
Most of the work can be done on a bench workstation, either on the jobsite or in a shop. When it's time to nail up the shingles, the strips make installation lightning fast.

FOUR GABLES

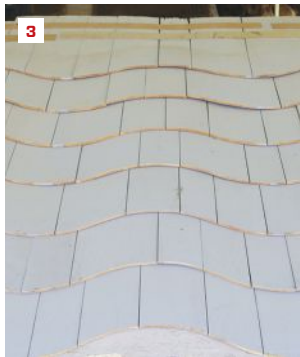
On this project, the contractor had a crew siding the house, and we were brought in just to shingle the wave design on four street-facing gable ends (1). We met with the owner to review wave samples so she could make the decision about the wave design. To show owners and designers what different patterns will look like, I save extra shingle strips from previous jobs with different wave heights (the distance from trough to crest) and frequency (distance from top



1



2



3



4

To help the homeowner visualize the wave pattern options for her home's four gable dormers (1), the author showed her samples of offset (2) and stacked (3) waves, then tacked a sample on one of the walls (4). A cardboard template of the uniformly sized dormer gables simplified cutting the panels to fit (5).



5

of one wave crest to the next). Heights and frequencies can be adjusted to suit the gable size, roof slope, and designer or owner preference. The shingle exposure can be adjusted, too, though I prefer to stick with the same exposure as the field shingles—on this job, that was 5 inches.

After the height and frequency of the wave, the biggest decision for the owner is choosing whether to have the wave crests stack evenly above each other or shift slightly for an offset (2, 3). The appearance of stacked and offset shingles changes with the view angle. It's only when you see them up on a gable end and walk along the front of the house that you get the sense of how the angle affects the appearance, so we tacked shingle samples on a gable for final confirmation from the owner (4). On this project, the owner also needed to select the shingle course where the wave would begin.

Since the gables were small and uniformly sized, we made a cardboard template, and on it we marked the course exposures the siding crew was using on the rest of the house (5). Cardboard templates aren't practical on large gable ends, but the advantage to using them on small gables is we can cut the ends of the shingle strips to match the roof slope on the bench. When shingling large gables, we fabricate the shingle strips long and cut them during installation.

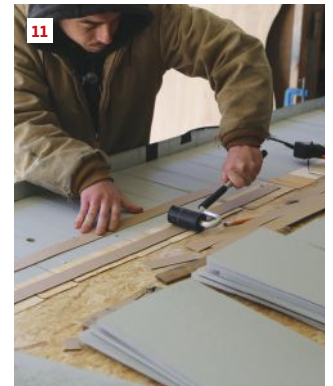
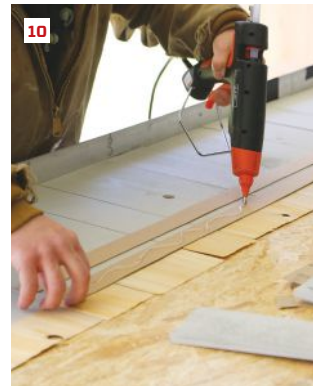
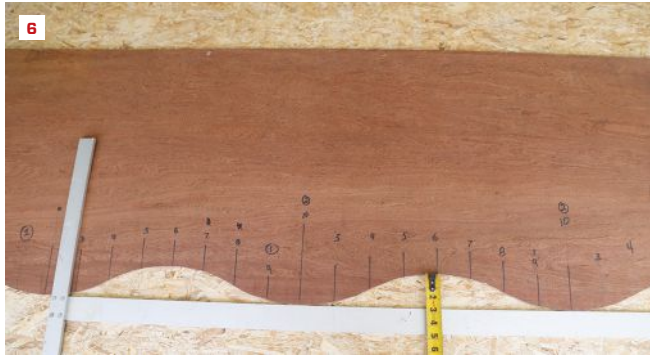
We instructed the siding crew to apply shingles up to a level two courses below where the wave design started. We needed to install two regular courses ourselves to adjust the shingle-joint offset—a minimum of 1½ inches—in order to blend the joints in the sider's last course to the joints in our wave base course.

SHOP PRODUCTION

All we need to mark a wave pattern on shingle strips is a 3/16-inch plywood template about 4 to 6 feet long that includes two or three crests and troughs. Since the shingles are cut shorter at the wave crests, you have to consider what the limits are to the height of the waves. With 15-inch-tall white cedar shingles and a 5-inch exposure, I like to limit the wave height to 3 inches. When using taller red cedar shingles with a 7-inch exposure, I have gone with a wave as tall as 4½ inches. On this job, we went with a 2 9/16-inch wave height, with a 21 1/2-inch wave frequency (6, 7).

Using a combination of compass arcs on newsprint paper, I drew a crest and trough, then blended the crest and trough arcs together free-hand. Next, I folded the paper at the center of a crest (you could also fold it at the center of a trough), cut out the pattern—like making paper cutout dolls—and transferred the paper sketch to the plywood. For a 2 11/16-inch wave offset between courses, I divided the wave frequency by 8.

I lay out a wave pattern on a gable by focusing on the top few courses rather than the base, because that's where peoples' eyes are drawn. If a gable's top courses look unbalanced, the whole wave effect can be distracting rather than interesting—especially when the wave crests are offset. For this project, we decided the center of a wave trough should land at the course below the top one, figuring that only a couple of inches of the top course would be noticeable. This would help balance the wave form on the gable. From there, we counted courses downward to determine which offset line would orient the lowest wave course. The offset line for that bottom course is labeled #1 and all the other offset lines are marked numerically #1 to #8 in sequence until it repeats at the ninth course.



The template has a wave pattern with a $2\frac{9}{16}$ -inch wave height (6) and a $2\frac{1}{2}$ -inch frequency (7); vertical lines represent the $2\frac{11}{16}$ -inch wave offsets between courses. With the base course butted to a straightedge (8), a worker marks the shingles for two rows of drywall shims (9) and glues them on (10). Applying pressure with a roller improves adhesion (11).

A couple of sheets of OSB laid across horses make a good workbench. We clamped $1\frac{1}{2}$ -inch aluminum angle to the OSB as a straightedge stop to align the shingle courses and to guide the width of each course (8). The gable is a 12 pitch, so with course exposure at 5 inches, each course from rake to rake is 10 inches shorter than the previous one. We marked the center point of the gable and the measurement for the first wave-shingle course width on the straightedge. We made additional marks 5 inches in from each of the outer points of the previous course. Having the straightedge double as a layout jig simplifies measuring out the shingles and end cuts for each course.

The first course of the wave pattern is a double course. The base course is a straight course of shingles, and the first course of wave shingles lies on top of it, with the troughs of the waves in the first wave course matching the butt line of the base course. The shingles are dry laid on the bench and butted to a straightedge in the same fashion as installing shingles on a ledger nailed to a wall. Using a measuring stick marked to locate the position of the two cardboard drywall shims, we make a couple of tick marks every 3 feet to which we align the shims for gluing (9).

Two rows of drywall shims are glued to the shingles a couple

of inches apart near the top so the strips stay straight (10, 11). The collated strips are easy to mark, cut, and handle without falling apart. We start with full-length drywall shims, gluing the middle group of shingles into strips about 40 to 48 inches long. This is the first project we've used hot-melt adhesive on, but we've also tried CA glue, spray contact adhesive, and construction adhesive. Each works, but I keep experimenting to see if there's one that works better than another. So far, I like hot-melt because it has a little open time to line shingles up, bonds aggressively, and sets quickly.

After applying the adhesive to the shim, we flip it over and press it onto the shingles by hand, being careful to keep the butts square to the straightedge and the joint spaces even. Running a J-roller along the shims afterward ensures a good bond.

STARTING THE WAVE

The first course is made up of a double row of three collated strips of shingles. At the ends of the course, diagonal drywall shims match the slope of the roof and align with the underside of the rake overhang. The portions of the shingles above the diagonal shims will be cut off later. To keep track of the collated strips, we label them by course number and as left, center, or right so bundles can be



The three collated shingle strips making up the course are labeled with a course number and as a center, left-, or right-hand strip (12). The first wave-course shingles are placed directly over the base course, with the joints offset a minimum 1 1/2 inches (13), and shims are glued on the diagonal to match the rake (14). Working from the centerline marked on the straightedge (15) and the first wave offset line marked on the template (16), a worker draws the pattern on the shingles (17).

stacked and later keyed into position on the wall (12).

The next course—the first wave course—is laid directly on top of the previous row of shingle strips (13). This makes it easy to see and ensure that the shingle joints have the minimum 1 1/2-inch offset. As with the course below, the shingle butts are aligned with the straightedge and the gaps between shingles are set. To speed up selecting shingles to lay out on a course, we rough-sort them by width into piles on the bench.

The end shingles in each course are matched to the course-width marks on the straightedge. The roof slope is 45 degrees, which we mark on the end shingles using a tri-square; a shingle edge extends the line along the top of the shingles. Then we glue drywall shims along the 45-degree roof-slope line (14).

On each course, we transfer the center reference marked on the straightedge to the middle shingle in the course (15). Later, when the shingles are installed on the wall, aligning the center marks ensures a precise installation.

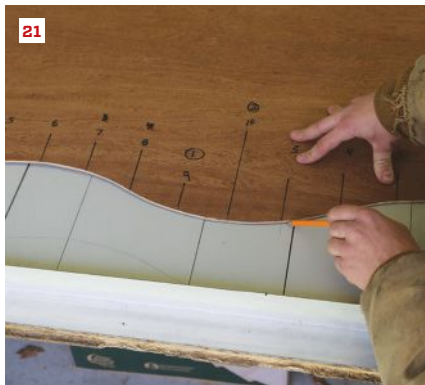
The shingle collation process is the same for each successive course: Glue drywall shims along the top of the shingles in groups;

label each group by course number and location (left/right/center); align the wave-template offset line for the first wave course to the center mark on the straightedge (16); draw the template shape onto the shingle strips (17); and shift the template along the shingle course to extend the wave pattern to the end of the course.

OVERLYING SHINGLE COURSES

When installing straight-shingle courses on a wall, siding installers snap a chalk line across the shingles to align the shingle butts of the overlying course. This process doesn't work when installing wave shingles, so we mark a guideline on the wave-shingle course while the shingles are still on the bench. We measure up from the straightedge to the top of the wave crests of the overlying course. This distance—7 9/16 inches—is the course-exposure height (5 inches) plus the wave height (2 9/16 inches). Using a straightedge, we draw a faint pencil line at the crest height (18) and then draw the centerline up the face of the shingle (19).

With the template oriented so the crests align with the faint pencil line for the next course exposure and positioned with the



After marking the crest height of the next course on the first course $7\frac{9}{16}$ inches above the butt line (18), a worker marks the centerline (19). With the wave crest of the template aligned to the course line and the next offset line registered to the centerline (20), the wave is marked lightly in pencil to indicate the overlying course alignment when the shingles are applied in the field (21). Each successive course of shingles is butted up against the straightedge (22) and sized narrower than the course below according to the layout marks on the straightedge (23).

next template offset line (#2) registered to the centerline (20), we draw a faint pencil line along the template (21). This line is used to orient the wave course above when the shingle strips are installed on the wall and to mark the fastener locations.

Since shingle fasteners follow the wave shape rather than a straight line, we make a chalk mark for each fastener $\frac{3}{4}$ inch in from the edge of each shingle and about 1 inch above the wave line marked for the overlying course. Marking the shingle fasteners at this point minimizes the chance of mislocating a fastener when installing the shingles on the wall.

Each shingle course is stacked on top of the previous course during assembly, with the shingle joints offset $1\frac{1}{2}$ inches (22). Shingle courses end at the marks on the straightedge, 5 inches shorter on each end from the previous course. Then we mark 45 degree-angle cut lines at the ends (23), along which we apply the drywall shims, gluing and rolling them to make the shingle strips.

The procedure is the same for each successive wave course: Place the shingles along the straightedge on top of the previous course,

collate and label the strips, orient the template along the straight-edge and draw the wave cut line, mark the crest of the overlying course and orient the template to it, and draw the overlying course guide line. Then repeat. The only steps that change in the process are shifting the template offset mark by one position and narrowing each course according to the straightedge layout.

CUTTING OUT THE DESIGN

After four or five courses are stacked, collated, and marked along the straightedge, it's time to cut the wave shape and stack the strips out of the way so that we can move on to the next batch. To orient the next course of shingles for the shingle-joint offset, we leave only the top course of shingle strips from the previous batch along the straightedge as we work our way up the wall.

Placing each shingle strip along the bench edge for support, we use a jigsaw with a fine-tooth blade to cut the wave shape (24). Sometimes, there's a little tear-out on the cut edges, so we keep a palm sander and 120-grit sandpaper handy to smooth them. The



After the strips for four or five courses have been assembled, a worker cuts the waves on each section with a jigsaw (24). Laying the shingle strips out on the shop floor allows them to be checked for mistakes prior to delivery to the jobsite (25). On this job, all the assembled shingle strips that were needed to complete the four gables fit into the back of a pickup truck (26).



A plumb centerline snapped on the gable wall guides the shingle-strip installation (27), which starts with tack-stapling the base course for the first wave course to the wall (28). Wide shingles simplify the two-course transition between installed shingles and the base-course shingles before the wave pattern starts (29). After the first of the two interceding courses is installed, the base-course shingle strips have to be removed in order to install the second straight-shingle course; marks are needed to show where the shingle joints of the base course land (30). The joints on the second straight-shingle course have to be offset from both the joints in the first course and the marks indicating the base-course joints (31).

shingles on this project were prefinished, so we applied two coats of matching stain to the cut edges.

Once we've finished collating the shingle strips and cutting them out, we lay them out flat on the floor to make sure we haven't missed any courses (25). We also check that the shingle-joint off-

sets are correct, the faint guide lines for the overlying courses are right, and the fastener chalk lines aren't missing or positioned too low. Then the shingle strips can be stacked and protected for delivery to the jobsite. On this project, four gable ends of pre-cut shingle strips fit in the back of a pickup truck (26).



With the center wave-shingle strip aligned with the centerline of the gable end, and the wave troughs aligned with the butts of the base-course shingles (32), fasteners are driven at the chalk marks made when the shingles were laid out on the bench (33). The rest of the shingle strips are installed course by course from the centerline out and aligned with the faint pencil exposure line along the bottom (34). The diagonal drywall shims holding the strips together are covered by the rake frieze trim (35).

BEGINNING THE INSTALLATION

At our direction, the siding sub had stopped his shingle installation two courses lower than the base course for the wave shingles. We started our installation by marking the center of the gable and snapping a plumb chalk line to guide the shingle-strip installation (27). The base course for the first wave course helps guide where to locate the shingle joints in the two interceding courses below the wave pattern, so we tack-staple it temporarily to the wall (28).

Using our best judgment, we blend the shingle joints of the interceding courses to make sure to maintain a minimum 1½-inch offset. We've found that using wider shingles than normal in the interceding courses makes it easier to avoid close joints (29).

After the first of the two interceding courses is installed, the base-course shingle strips have to be removed in order to install the second straight-shingle course. First, though, we mark the locations of the base-course shingle joints on the shingles underneath (30). The joints on the second straight-shingle course have to be offset from both the joints in the first course as well as the marks indicating the base-course joints.

After we fasten the second straight course of shingles, we install the base-course strips for the wave shingles, driving fasteners at the

chalk marks just above the overlying wave-course pencil line (31).

COMPLETING THE WAVES

From this point on, installation is a breeze. We start by aligning the center wave-shingle strip with the centerline of the gable end, and the wave troughs with the butts of the base-course shingles, then fasten it in place (32). Then we install the shingle strips to the left and right of the center strip until we reach the end of the row. We move on to each course above until reaching the top (33, 34). After nailing up the final course, we install the rake frieze trim (35).

On this project, the first set of wave-shingle strips for the four gables took one person 4½ hours to lay out, collate, cut, sand, and paint the edges. By the third and fourth gable sets, the shop process was down to two hours.

Installation of the two regular transition courses took about an hour and a half for one person, mostly for the extra work positioning shingles for the minimum joint offset. The collated wave strips went up fast—about an hour per gable, not counting staging set-up time.

Mike Guertin is a builder/remodeler in East Greenwich, R.I. and leads demonstrations at JLC Live and Deck Expo. Follow him on Instagram: @mike_guertin.



Malco[®]



Come See all your Favorites
**Fiber Cement Siding
TurboShear!**
BOOTH #838



JLCLIVE
RESIDENTIAL CONSTRUCTION SHOW

August 12 - 14, 2021
RHODE ISLAND CONVENTION CENTER | PROVIDENCE, RI
Malco Products, SBC • Annandale, MN. U.S.A.
www.malcotools.com

professional deck builder

July/August 2021



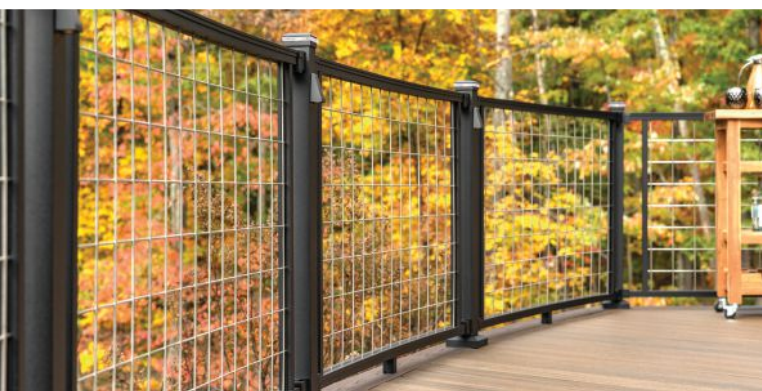
03 CIRCLING THE SQUARE

07 PLAYPEN BACKYARD

17 A SUMMER KITCHEN

23 SCREENED PORCH UNDER
A ROOFTOP DECK

28 AN ACCESSIBLE SPA



When elevated aesthetics meet unmatched performance, the result can only be Trex.

When it comes to creating the perfect outdoor space, Trex® has been laying the groundwork for more than 20 years. Our premium Transcend® decking gives your customers the depth and beauty of wood with none of the time-consuming maintenance. Pair that with the stunning look of Trex Signature® aluminum railings for an effortless, eye-catching design. And since Trex is made with 95% reclaimed wood and plastic film, we offer your customers a truly environmentally friendly decking choice. When high-level aesthetics come packaged with low-maintenance durability, the result is a masterpiece that leaves a lasting impression. To learn more, visit [trex.com](https://www.trex.com).



Engineering What's Next
in Outdoor Living®



Scan to view
our decking and
railing duos.

Circling the Square

by Mark King



Because I like to include curved features in almost all the decks I build, a circular theme highlighted each of the three design options I presented to my client in my proposal for her new deck. Built in a Lakeville, Minn., development, her year-old home was a blank slate in need of a backyard living space that would distinguish it from its neighbors. My client wanted to include a hot tub in the design, so creating a sense of privacy was another goal.

The plan that she decided on is essentially a rectangular deck with a wide set of semicircular stairs with deep treads leading to the backyard. To visually complete the curve started by the stairs, I designed the deck with a simple circular inlay. Set off to one side, a hot tub would be supported by its own slab and shielded on two sides by a privacy fence.

Start with the curves. Before I started framing, I heat-formed the circular inlay and curved treads in my shop and used them later to guide the exact placement of framing, decking, and fasteners as I laid

out and built the deck. While the circular inlay consists of a single row of Azek Frontier 1x8 PVC trim, the treads consist of two rows of the same material, so I formed both the inner and outer rows for the treads in the same double-wide form.

While I formed the circular details, a landscaping colleague worked on site forming and pouring the slab for the hot tub. When we arrived on site later with the curved pieces to begin framing the deck, the hot tub was already installed.

Framing. The rectangular 10-foot-by-20-foot deck is simply framed, with the joists supported at the house by joist hangers fastened to a ledger. At the other end, the joists bear on a triple 2x10 dropped beam, which in turn is supported by three GoliathTech helical piers.

Cantilevering the joists allowed us to cut them to length as necessary to form the deck's circular projection. We used the curved lengths of decking as templates, laying them out across the cantilevered—but uncut—joists and tracing the curves in place. Then we cut the

A semicircular staircase offers a nice counterpoint to the deck's rectangular footprint and the home's tall back wall (A). The author heat-formed the curved treads and inlay ahead of time, using them to lay out the deck (B).

joists to length, adjusting the cut line to account for the thickness of the rim joist and fascia.

We used a triple layer of 1/2-inch PVC ripped to a 15-inch width from 4x10 sheet goods to form the rim joist on the curved section of deck. We laminated the layers together with PVC cement as we fastened them to the framing, first rough-sanding the mating surfaces to improve adhesion. Besides conforming easily to the curve, the oversized rim joist creates a solid connection point for the 15 stringers needed to frame the wide curved stairs and doubles as the finish riser.

Decking. When installing the grooved TimberTech Terrain (in silver maple) decking, we were careful to locate the hidden fasteners so that they didn't

EYE FOR DESIGN



When installing the decking, the author avoided using any hidden fasteners where the inlay would be located (A). After tracing the inlay's outline, he cut out the decking with a small circular saw and pressed the inlay into place (B).



The stair stringers were fastened to the curved PVC rim joist with HeadLok flat-head structural screws, driven from behind through the rim into the stringer stock (A). The extra-wide treads consist of a double row of 1x8 decking (B).

intersect any cut lines for the circular inlay or border.

On the straight sections where we installed the picture-frame border, we cut to the lines with a track saw. We face-fastened the borders to the framing using the Cortex screw-and-plug system and reinforced the mitered corners with PVC biscuits and Azek's proprietary fast-cure PVC adhesive.

For the inlay, we cut to the curved lines with a cordless 6½-inch circular saw. Then we pressed the inlay into place, again using the Cortex screw-and-plug system to fasten the inlay to the framing.

Stairs. We had planned to pour a concrete landing pad to support the stair

stringers, but our client liked the way the stairs seemed to spring up out of the lawn. So instead, we fastened the bottoms of the stringers to 2-by pressure treated material laid on the flat, trimmed back so the blocking would be concealed by the PVC risers. After shimming the blocking and stringers so that everything was level, we installed blocking between the two pairs of end stringers to support the treads, since the spans exceeded those recommended by the manufacturer.

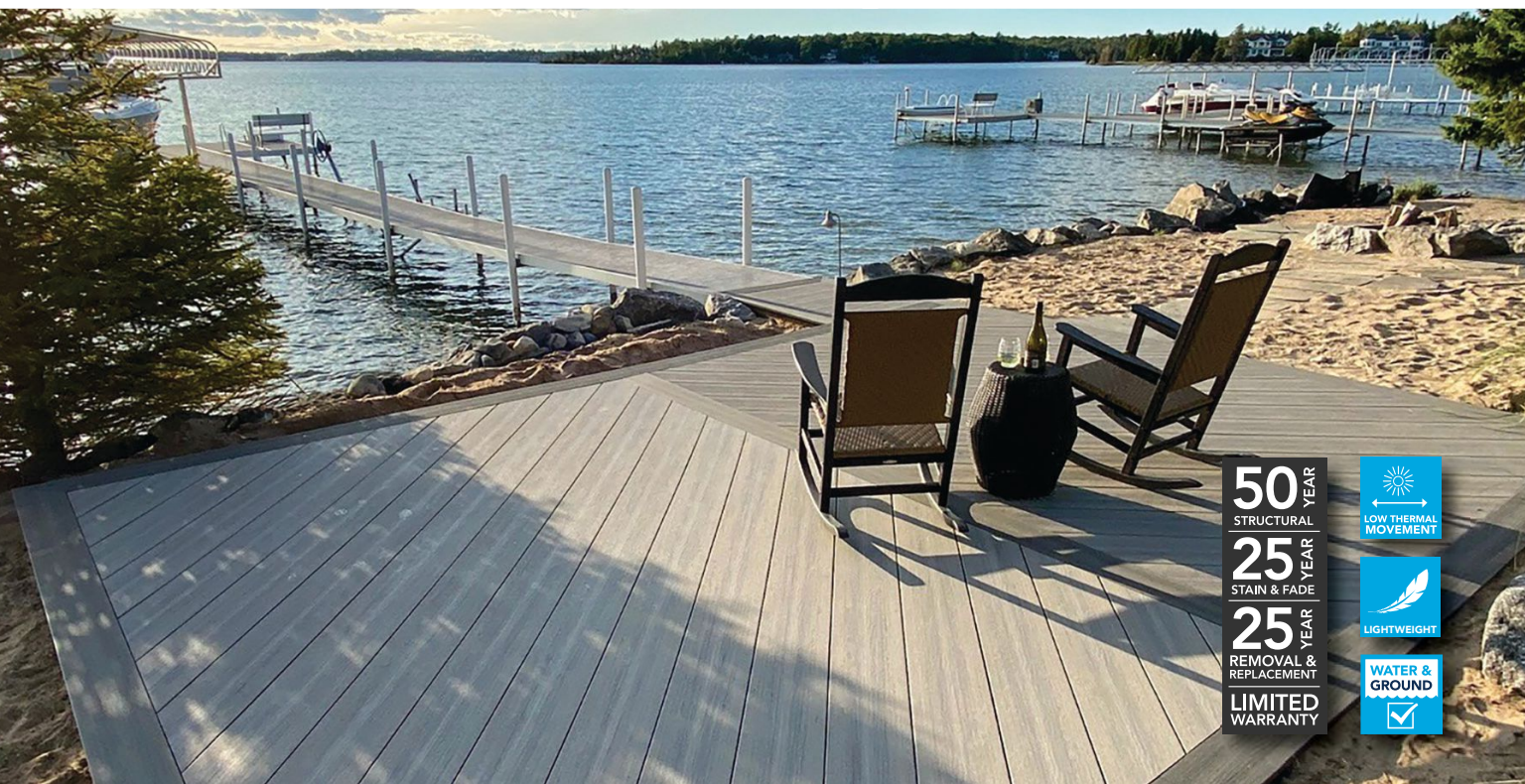
Finally, we screwed the double curved treads to the stringers and installed the PVC risers, filling the holes with matching Cortex plugs.

Railing and privacy screen. Though

the deck is low enough to not require a railing, our client asked to see some low-maintenance options and chose a custom-fabricated powder-coated-aluminum railing system from Railcraft, a Canadian supplier. For better visibility after dark, we fitted the top rail with Dekor's Infinite Lite LED strip lights.

To finish off the project, we installed a privacy screen around the hot tub. Manufactured by HideAway, the screen consists of four 3-foot-wide laser-cut powder-coated aluminum panels fastened to the manufacturer's aluminum mounting posts. ❖

Mark King owns Infinite Decks, in Minneapolis.



50 YEAR
STRUCTURAL
25 YEAR
STAIN & FADE
25 YEAR
REMOVAL &
REPLACEMENT
LIMITED
WARRANTY



UNMATCHED VERSATILITY

From rooftop decks to ground-level boardwalks—no other decking offers the installation versatility of Deckorators® Mineral-Based Composite (MBC) Decking.

IT'S NOT PVC. IT'S BETTER.

DecXorators® Go Beyond Ordinary

Learn more at [Deckorators.com/MBC](https://www.deckorators.com/MBC)

Tiger Claw[®]

Hidden Deck Fasteners



FIRST TIME USER PROGRAM

Receive a FREE Tiger Claw Installation Gun when you purchase two buckets of Tiger Claw TC-G Clips!

Universal Board Compatibility in a Single Simple Tool

There's no need to compromise between strength, simplicity and speed. With the combination of the TC-G Hidden Clip for Grooved Decking and the Tiger Claw Installation Gun, it's the fastest way to attach hidden clips on all leading deck brands including Fiberon, Trex and more.



FastenMaster.com 800-518-3569



Playpen Backyard

In an urban setting, where space is at a premium, a New Jersey contractor packs a lot of outdoor living into a compact footprint

by Rob Corbo

When I first met Molly and Andrew Peters, they had just purchased an urban row house in Hoboken, N.J., and had extensive plans to renovate the interior. Eventually, they also wanted to add a backyard patio, with a small deck off their kitchen above it, and transform the overgrown backyard into a play area for their kids, but there wasn't enough money in their initial budget to check off all of the items on their wish list. The backyard would have to wait for phase 2.

During our phase 1 renovation of the interior, which included opening up the lower two stories of a four-story back wall and replacing the brick with a two-story window wall (see "Revitalizing an Urban Row House," *JLC*, Mar/16), we did three things in preparation for the back-

yard work. First, we cut the 3-foot-high grass throughout the small yard down to grade. While doing the structural work for the window wall, we installed two LVLs supported by steel angles in the back masonry wall to receive a ledger for the new deck. Finally, we extended a patio drain line into the backyard that connected to the stormwater line that also serviced the roof gutter downspout. Over the next couple of years, until the clients were ready to begin phase 2 and address the backyard, we had a crew cut the grass down to grade each fall.

Optimizing a Small Lot

The backyard plan called for a bluestone patio with an ipe deck above, two bluestone steps up from the patio to a turf

grass play area, and a planting bed at the very back end of the property. A cedar fence with lighting set in a block retaining wall with a bluestone cap would provide privacy on three sides of the yard.

In Hoboken, plan approval by both the zoning and building departments is required and includes a "Letter of Notification" sent to neighbors informing them of construction and assuring them that their property would be protected in accordance with Section 3307 (Protection of Adjacent Properties) of the International Building Code, New Jersey Edition. As part of our permit application, we had to submit certified mail receipts of the "Letters of Notification" that were sent out.

Once plans were approved and permits issued, our first order of business was

Playpen Backyard

to cut the grass down to grade. Because the neighbors had approved of our using the existing fence alignment for a new fence, we next marked out the location of the old cyclone fence on the north and south sides of the property and removed it. After the lot was cleared of all debris, we laid out the retaining walls and fence posts, running strings from the building's back wall to the back neighbor's fence from our marks.

While the landscaping sub dug the retaining-wall trench and post holes along the string line by hand, materials were brought in, also by hand. Without truck access, all materials needed to be manually carried in from the street side of the property. Deliveries were curbside, and then the landscapers entered the building through a door under the front stair and carried the materials through the house to the backyard by hand, in bags or in buckets.

To ensure we would have street parking for the delivery trucks, we purchased "no parking signs" from the town: \$25 per spot per day, two signs minimum. (We pay about \$5,000 a year to the city for parking signs, parking tickets and tire boots when caught parking illegally, and dumpster permits, as well as for police officers to monitor our street closures, usually for concrete deliveries and cranes lifting HVAC units onto roofs.)

Perimeter Fence

With trenches and footings dug and materials on site, pressure treated (PT) 4x4 fence posts were set along the string line in 3-foot-deep, 8-inch-diameter holes spaced 8 feet apart, which were then filled with concrete. Mason Victor Bezama and his crew from Unlimited Building Management set the CMU retaining walls three blocks (or 24 inches) high, with roughly 16 inches below grade and 8 inches above, on top of a gravel bed. Then they filled the blocks solid with mortar and applied a stucco finish to the sides of the perimeter wall. The wall was



topped with bluestone capstones, which were notched to slip around the posts and set on a bed of mortar.

On the neighbors' side of the fence, we installed 5/4x6 PT decking, running the boards horizontally from the bluestone caps up to the 66-inch height of the fence. Before we installed the cedar fencing on our client's side, the electrician ran the conduit and boxes for the fence lighting. Lights were spaced 8 feet apart and 55 inches high, just under the 5-foot maximum height allowed by code, to minimize their intrusion on neighbors. We waited until after deck construction to install the cedar interior fence boards and ipe fence cap (to match the decking).

Laying the Groundwork

Construction of the retaining wall included the installation of the CMU planting-bed walls and the two steps up from the patio area to the turf grass. The



Figure 1. Measuring just 15 feet wide, the overgrown backyard was bordered on two sides by an old cyclone fence (A). After removing it, workers removed the sod and brought in materials to build a short CMU retaining wall around the yard and a perimeter fence (B). With no access for machinery, the trench for the perimeter fence was dug by hand (C).



KEY-LINK™
FENCING & RAILING

Builder
BRAND LEADER 2021
HIGHEST QUALITY DECK RAILING



HIGHEST QUALITY MEETS DRINK RAIL

More than 700 builders and contractors named Key-Link “Highest Quality Deck Railing” in the recent Builder Brand Survey. Now that high-quality comes to a deckboard railing.

Like all Key-Link railing, the Chesapeake Series is easy to install, with a special predrilled T-shaped cap on top where you can place a beverage rail. Lay the deckboard on top of the Chesapeake Series, attach via the hidden screw holes, and there you have it: a drink rail with no special brackets or adapters.

LEARN MORE: KEYLINKONLINE.COM    

Playpen Backyard



Figure 2. The 4x4 posts for the perimeter fence were set in 3-foot-deep holes that were then filled with concrete (A). Over a compacted gravel base in the bottom of the trench, masons laid up a short CMU wall around the perimeter of the yard, as well as a wall to create a small planting bed at the back of the yard (B). The walls were capped with bluestone (C). Bluestone treads were installed on the steps leading down to the lower level near the house (D).

masons capped the planting-bed walls with bluestone and installed bluestone treads on top of the steps that divide and define the patio and the play area. Then it was time for both the patio and the play area to receive a 4-inch base of quarry process (QP). As with the dirt removal and material deliveries, the QP had to be brought in through the house by hand. We took care to protect the finished floors inside the house and installed walk boards spanning the patio area so that wheelbarrows could be used to deliver the QP up the steps to the play area.

Once the play-area base was compacted and level, we removed the walk boards so that QP could be deposited for the patio. First, though, we located the two

deck post footings that had been poured during wall construction. The plan was to set the 6x6 posts in brackets on top of the patio bluestone above the footings. Once the footings were located and recorded, we dumped, spread, compacted, and pitched the QP to the patio drain.

The bluestone patio went in next. Once again, the masons had to carry the load—this time, approximately 80 18-by-24-inch pavers—in by hand (at about 60 pounds per paver and 100 pounds for each of the four 10-inch-wide by 8-foot-long stair treads, no gym workouts were needed during backyard construction). The challenge was creating a proper pitch from the four corners to the center drain using large and heavy pavers. A couple

of buckets of loose QP to utilize during layout, and patience, did the trick. Joints were made tight, but afterward, we brushed in polymeric sand to fill voids and create a solid, stable surface.

Ipe Deck

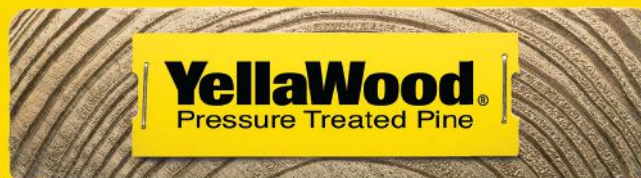
Being that I was one of the carpenters, it was now my turn to carry materials in. Between the length of the ledger and joist stock and the tight turn to enter below the front stoop, we had to bring all the deck lumber in through the story above and lower it down into the backyard.

During the earlier renovation phase, we had situated an LVL exactly where we knew we would need to attach a future deck ledger. Now, we had to pad that LVL



TOP-QUALITY. ENVIRONMENTALLY-FRIENDLY. BEAVER-PREFERRED.

The most experienced builders instinctively know a five-star backyard made from YellaWood® brand pressure treated pine can turn the next project into more referrals. As the most recognized name in the business, homeowners seek out contractors who use the YellaWood® brand. It's preferred by expert builders of all kinds. Especially those with leather tails, buck teeth and nature's highest building standards. Follow your natural inclinations and seek out the Yella Tag. Find a dealer at YellaWood.com.



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

Playpen Backyard

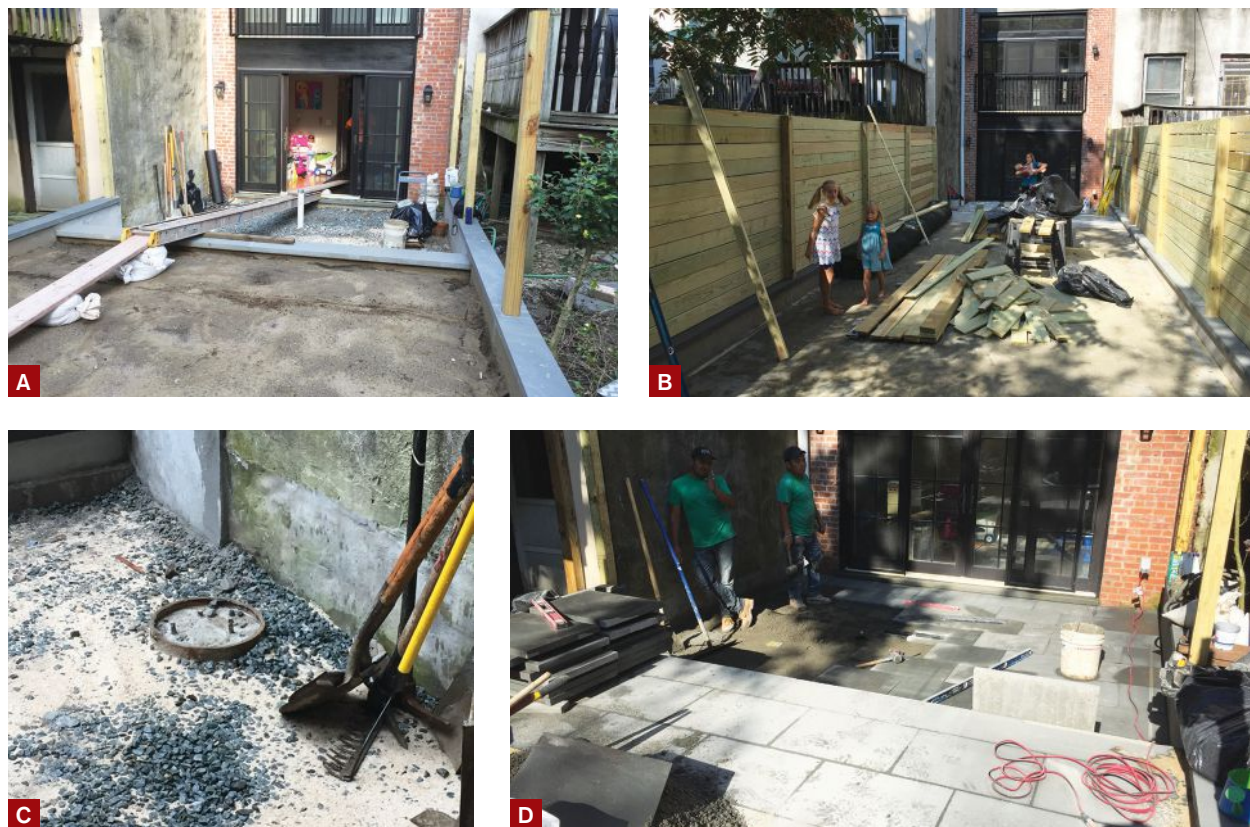


Figure 3. All materials had to be transported by hand from the curb at the front of the house to the backyard through the brownstone townhouse (A). Around the exterior of the perimeter fence, $\frac{5}{4} \times 6$ pressure-treated decking was installed horizontally up to the maximum 66-inch height of the fence (B). Footings for the deck's two 6x6 support posts were poured (C) prior to the installation of the bluestone paver patio in the lower area (D).

with solid 2x10 blocking beneath the second-story door to bring the face of the opening out flush with the brick wall on either side of the door, since the ledger would overlap the brickwork.

After cutting two PT 2x10s to length for the blocking, project manager Danny DoCouto wrapped their backs with Vycor Plus before fastening them to the LVL with HeadLok flat-head structural screws. Next, because there was still an uneven reveal from one side of the opening to the other, he applied PVC strips ripped to the width of the blocking as needed to pad the opening flush for the ledger installation. Finally, he cut the ledger to length and bolted it through the PVC strips and PT blocking into the LVL with long, staggered $\frac{1}{2}$ -inch-diameter lag bolts every 16 inches on-center. Where the


ledger overlapped the solid three-wythe brick façade, he drilled pilot holes into the masonry and used expansion bolts and injection epoxy mortar.

Next, we installed the 6x6 PT support posts, bracketing them directly to the bluestone pavers that bear on the concrete piers that had been poured earlier. After temporarily bracing the posts plumb, we used a laser level to mark their heights, allowing for the installation of a dropped triple 2x10 beam to carry the deck joists. To pitch the deck for drainage, we set the top of the beam $\frac{3}{4}$ inch lower than the bottom of the ledger.

The 2x10 deck joists measured just over 9 feet long, including a 12-inch cantilever. We used joist hangers to mount them to the ledger, and angles to secure them to the beam. To strengthen and stiffen

the deck a bit more and minimize the amount the joists would twist, we installed mid-span blocking between them. To ensure that the decking would end with a full-width deck board, we let the cantilevered joists run long, which allowed us to run the decking and accurately cut the joists to length later.

The plans specified $\frac{5}{4} \times 6$ ipe material installed with hidden fasteners. It was a small, rectangular deck, about 12 feet wide and 9 feet deep, with a downspout in the southwestern corner as the only penetration to contend with, so running the decking material took little time. We conditioned the ipe with a penetrating oil, and we painted the posts and beam with black paint, so the completed deck blended nicely with the kitchen sliders when viewed from the backyard.



"GRABBER HAS THE BEST PRODUCT OUT THERE

AND THE PROS KNOW IT"

"Professional Grade" isn't a boast. It's a fact. Professionals choose Grabber for faster install times, fewer do-overs, less waste—and most importantly, more money. Because when your jobs go faster, you can do more of them. (Or just enjoy a longer vacation, but that's up to you.)

Quality, that's it. Grabber has the best product out there and the pros know it. They want to use the best, and there is no substitute for Grabber fasteners. Once our customers have used Grabber, they won't accept other brands—even for free. They only want the quality of Grabber fasteners.

— Loyal Grabber Customer, Ft. Lauderdale, FL



grabberpro.com/professional-grade

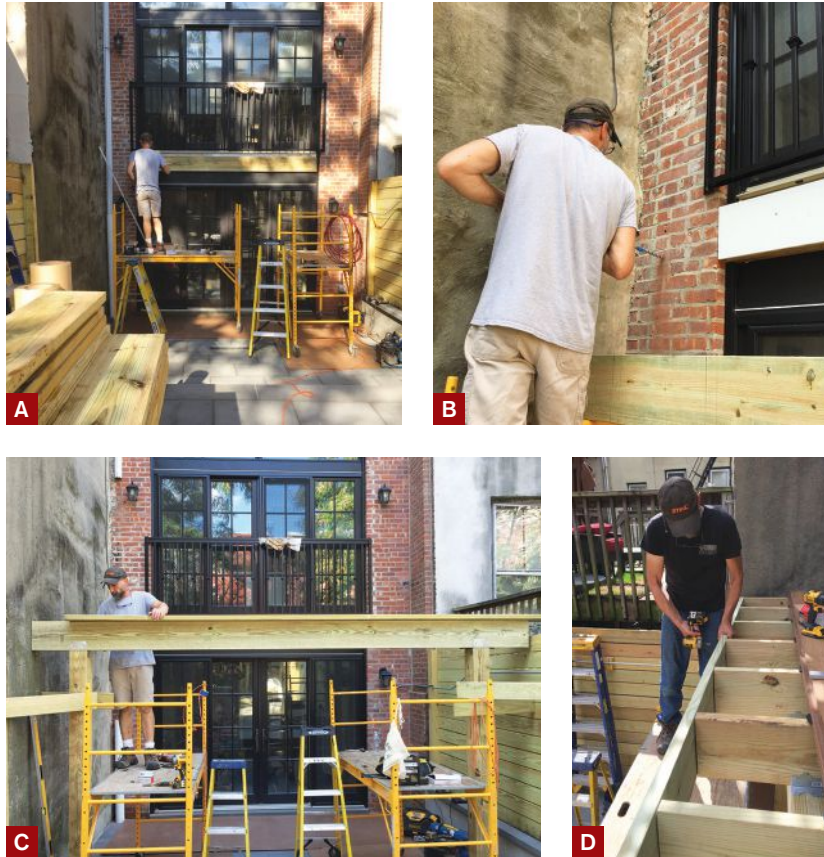


Figure 4. Before the ledger for the new deck could be installed, the opening between the two solid brick walls was padded out with solid 2-by blocking and a PVC shim (A). The ledger was fastened to the framing under the door opening with lag bolts and to the solid masonry wall with epoxied expansion bolts (B). The rest of the rectangular 9-foot-by-12-foot deck was conventionally framed with PT 2x10s (C) cantilevered over a dropped triple 2x10 beam (D).

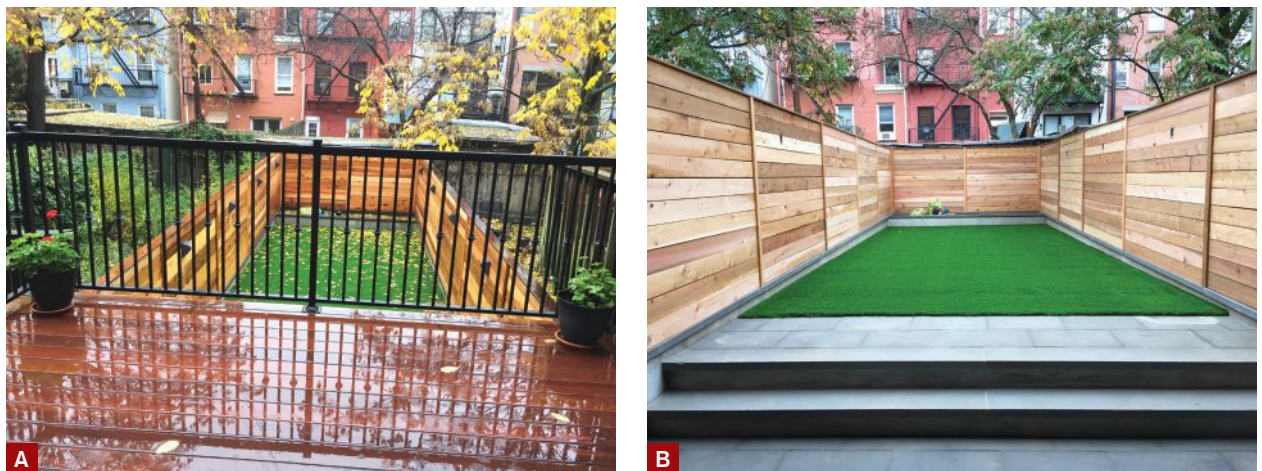


Figure 5. The ipe deck was finished with a custom-fabricated iron railing (A) and looks out over the compact backyard, which serves as a low-maintenance play area for the young family (B). Surrounded by a fence composed of red cedar boards, the backyard is covered with artificial turf instead of grass.

Finishes

We hired a subcontractor to install the deck’s iron railing, which matches the Juliet balcony rail we had installed during the renovation’s first phase (we had hoped to reuse it, but the fabricator was unable to incorporate it into the new railing).

After the fencing folks installed the red cedar boards that make up the interior wall of the fence, the electrician returned to install the light fixtures.

The artificial turf grass was the final piece of the puzzle. We chose Garden-Mark’s Montana synthetic turf, whose multihued polyethylene monofilament yarns, stitched through polypropylene woven fabric and fiber net backings, have a realistic texture and coloring. It came in a roll 15 feet wide and 100 feet long, so we didn’t need to glue seams or worry about the orientation of the grass fibers (or blades) in multiple sections of turf. The main trick was stretching the turf as tightly as possible, after which Victor and his crew staked it into place every 6 inches around the perimeter. To the delight of the homeowner (and us), the grass will never need cutting again. ❖

Rob Corbo is a building contractor based in Elizabeth, N.J., specializing in high-quality gut rehabs and renovations of inner-city residences.

WiseBond™ Epoxy
Is A Division Of
DeckWise
Manufacturers of Hidden Deck
Fasteners & Accessories

WiseBond™
PREMIUM COMMERCIAL GRADE

866.427.2547
Buy online at WiseBond.com



EPOXY



**2" Deep Pour™
Epoxy Kit**
2:1 Ratio



**Bar & Table Top
Epoxy Kit**
1:1 Ratio



WiseColor™
PREMIUM EPOXY COLORANT

WiseInk™
EPOXY LIQUID PIGMENT

Creating a wood project that is both artistic and functional is a deep source of satisfaction. Let your imagination run wild! You're in good hands now.

SINGLE POUR UP TO 2"
Epoxy River Tables, Live Edge Slabs,
Object Casting & More!

Epoxy, tools, accessories & colorants at:
WWW.WISEBOND.COM

SUPER WET GLOSS!
Self-Leveling Flood Coat for Table
Tops, Bar Tops, and Counter Tops

ATLANTIS®
RAIL SYSTEMS

Cable Railing Specialist



For Any Budget.

For Any Setting.

For Any View.

For Everyone.

Available Nationally Through Our Network of Dealers

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



Lonza

ENHANCING THE PERFORMANCE OF ENGINEERED WOOD PRODUCTS

Wolman®
SURFACE PRODUCTS

Permatek®
INSECTICIDE
PRODUCTS

FrameGuard®
MOLD & DECAY
PROTECTION

AntiBlu®
WOOD PROTECTION
PRODUCTS

Solutions to Fight Wood's Natural Enemies



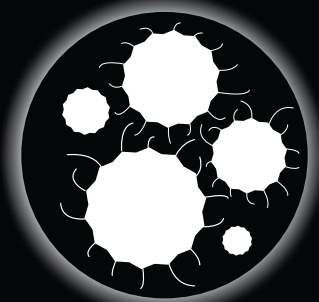
TERMITES



**FUNGAL
DECAY**



**WATER
DAMAGE**



MOLD

Learn more!
www.WolmanizedWood.com/EWP



A Summer Kitchen

A combination kitchen–wine room enhances a classic Hudson Valley farmhouse

by Kyle Diamond

A couple of years ago, a past client contacted our company, New Dimension Construction, with plans for an outdoor living project on his property. The homeowner—an architect—wanted to match the exterior of a late 19th-century farmhouse with a nearby guest house, both of which he owned with his wife. His idea was to build screened-in porches for both the main and guest houses with similar materials and provide outdoor stone patio areas with connecting walkways made from brick. Central to his plans would be an outdoor kitchen—the highlight of his ambitious project.

Having grown up in the Carolinas, our client's material selection of brick, reclaimed hand-hewn timber, copper,

and open screening gave the project a mid-Atlantic, early Americana feel that blended in nicely with the farmhouse (see photo, above). His design called for a free-standing, 13½-foot-by-20-foot outdoor kitchen featuring a brick oven, grill, and plenty of storage space—everything you would need to whip up a summer meal for friends and family.

The structure was sited near the main house on a sloping grade steep enough to allow for a walk-out basement, which the homeowner was glad to put to good use. A wine lover, he had always wanted a wine cellar, but the home's existing basement was not conducive to storing wine. The walk-out basement offered a perfect opportunity to locate a wine “cellar” below the kitchen.

Building the Structure

The kitchen's foundation was a hybrid block-and-poured-concrete wall with brick veneer. On the upslope side, the mason subcontractor formed and poured concrete foundation walls with 6-inch stepped brick shelves on the side walls that followed the sloped grade. On the downslope side, the foundation wall was 8-inch block on the interior and 4-inch brick-shelf block on the exterior. Two-inch XPS rigid insulation was sandwiched between the inner and outer masonry wythes in the walk-out area (fit around the brick ties) and applied to the exterior face of the poured walls, which were backfilled.

With the structural part of the foundation completed, the masons began laying

A Summer Kitchen



A sloping grade allowed for a walk-out basement wine “cellar.” Here, a mason installs brick veneer on the downslope block portion of the foundation over 2-inch XPS rigid insulation sandwiched between the brick and block (1). Beam pockets were made in the wall’s top course to let-in the 8x8 oak kitchen floor support beams (2).



Over the 8x8 oak beams, purlins are installed to support the cellar’s plank ceiling (3). Crew members build the structure’s moment frame out of engineered lumber and custom-fabricated steel brackets (4). The 2x12 Boral water table trim is capped with horizontal Boral trim beveled and kerfed with a drip edge for proper drainage (5).

up the brick veneer while we compacted the gravel base, installed a 10-mil vapor retarder membrane, and placed the 4-inch-thick basement slab.

The client planned to use the outdoor kitchen from late spring through mid-fall. The basement, however, would be storing wine year-round and was the building’s only conditioned space. So, our thermal envelope ran up the XPS-insulated foundation wall and horizontally in the insulated kitchen floor above. The target temperature for the wine room was a constant but relatively low 55°F, so we didn’t install sub-slab insulation (1, 2).

The floor assembly was fairly unique, given the structure’s design, use, and size. From the bottom up, we first installed 8x8 oak timbers, which run the width of building, in beam pockets 3 feet on-center. On top of the beams, we then ran 4x4 oak purlins 2 feet on-center the length of the building (3). Next, we installed rough-sawn 1-inch pine planking perpendicular to the purlins; the timber and planking gave the wine room’s ceiling a vintage, Old European look.

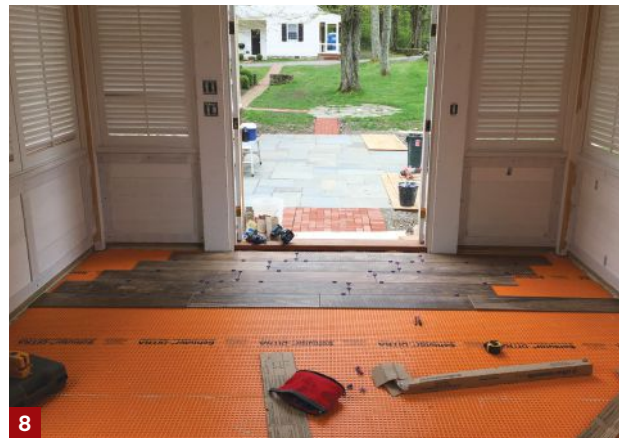
On top of the planking, we installed 2x4 joists 16 inches on-center across the width of the building. After filling the joist bays with 3 inches of polyiso rigid

foam, we glued and screwed a layer of 3/4-inch AdvanTech subflooring to the 2x4s. The resulting floor system was plenty rigid for the tile finish planned in the kitchen.

Moment frame. The kitchen’s exterior wall design called for mostly large louvers, windows, and doors with little sheathing, so a moment frame was needed to resist shear forces. We built the moment frame out of 5 1/4x5 1/4 PSL posts and triple 1 3/4x9 3/4 header stock and connected it together with custom-fabricated steel corner and T-shaped brackets (4). We lag-screwed the brackets into the posts and headers according to our



The exterior brickwork for the wood-fired pizza oven is a major feature on the building's north-facing façade. The wine cellar has an inswing door covered with a Craftsman-style copper roof, allowing sheltered access to wine during snowy Taconic mountain weather (6).



The custom-built windows and louvers are fitted with casement-window-style operable brass hardware. Here, hinge locations are routed out using a Porter-Cable hinge template (7). Porcelain tile that looks like hardwood flooring is dry fit over a Ditra uncoupling membrane (8).

engineer's specifications and secured the bottom of the posts with base connectors. Later, we trimmed out the moment frame's engineered lumber with Lifespan treated radiata pine (lifespan solidsselect.com).

At the roof, we site-built a couple of trusses from salvaged hand-hewn timbers and installed them at intermediary column locations (at one-third points of the room); the trusses made a visual connection to the reclaimed timbers we installed on the main- and guest-house porches. We framed the roof around the two trusses with 2x8s at 16 inches on-center, then sheathed the roof with Zip System sheathing. Completing the

roof, we installed pressure-treated cedar shingles over a cedar breather membrane and capped the unvented roof off with a copper ridge.

The Kitchen

The focal point of the kitchen interior was the wood-fired oven. Manufactured by Mugnaini (mugnaini.com), the Prima-100 oven kit arrived on site in sections. The mason put together the precast pieces on a small reinforced concrete slab poured within the block and brick wall assembly, then applied refractory mortar over the joints. A metal flue manifold (later connected to a metal liner run through the brick chimney) was attached

to the arch with masonry screws, then the oven's core was wrapped with two layers of thermal insulation blanketing. The mason finished the interior masonry surround, then later the exterior brickwork of the chimney—a handsome feature in its own right (6).

The client wanted a "pilaster look" for both the exterior and interior façades. This was achieved by centering the louvers, windows, and doors between the radiata-pine-clad PSL columns. Starting on the exterior, we ran 2x12 Boral poly-ash water table trim around the perimeter and capped it off with horizontal Boral trim, which we beveled and kerf cut to drain (5). On top of the beveled

A Summer Kitchen



9



10

Beadboard is installed between trusses made from salvaged hand-hewn timber (9). The wood-fired oven is the focal point of the interior, which also features Carrera marble countertops installed on base cabinets and custom-fabricated stainless steel shelving (10).



11



12

The wine-room walls are finished with a three-coat stucco finish (11). Designed by the architect-client, the wine shelving was built by NDC crew members using walnut-veneer plywood with walnut face frames (12).

cap trim, we installed 1½-inch-deep by 3-foot-high panels made with shiplap pine. We trimmed out the interior with primed finger-jointed pine.

The structure's large louvers, windows, and doors were custom-built off site out of mahogany. The client wanted the louvers and windows to open out like a casement, so we installed casement adjuster and locking hardware by Ives (iveshinges.com) to operate them. The solid brass ball-bearing hinges (deltana.net) were installed using a Porter-Cable hinge template and a router (7). A minor drawback to outswinging louvers and windows, of

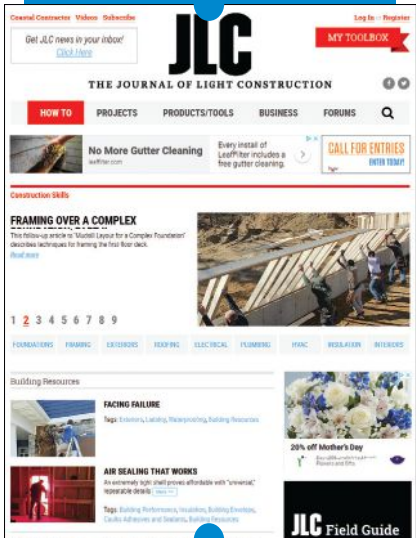
course, is that our clients have to forego insect screening in order to operate them.

Fitting out the space. We installed porcelain tile that simulates hardwood strip flooring over a Schluter uncoupling membrane on the floor (8) and beadboard on the ceiling (9). After installing our finishes, we fit out the kitchen with a stainless steel built-in gas grill, a single propane burner, a pot sink, and a warming drawer, all by Viking. Custom-fabricated base cabinets and stainless steel open shelving support Carrera marble countertops (10).

The wine room. The foundation

walls were finished with a three-coat stucco finish (11). HVAC equipment needed to condition the wine room's air (a constant 55°F to 57°F with an average 60% relative humidity is required) was housed behind the wood storage box below the oven, with an AC condenser unit installed outside on a pad. Finishing up, we built the homeowner-designed wine shelving out of walnut-veneer plywood with walnut face frames (12). ❖

Kyle Diamond co-owns New Dimension Construction in Millbrook, N.Y., with his father, Dale Diamond.



JLConline.com offers sound technical advice, practical how-to articles, expert hosted forums, as well as networking opportunities.



NOW AVAILABLE

Black Powder Coated



1

cut support channel



2

hook

n'-drop

Same Two Parts Does Level & Stairs



3

insert damper



4

fasten to your rail



revolutionary

new transparent railing in-fill system

For more information and easy ordering go to www.Invis-A-Rail.com

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

Make a Splash...

...At the industry's premier education, networking, and business marketplace.

This event is the largest gathering of pool, spa, patio, decking, and outdoor living leaders in North America and beyond.

We're reuniting the industry in-person, and rather than close out the year, we'll be kicking off next year's buying cycle.

Make a Splash, and take your professional development further, faster by participating with the International Pool | Spa | Patio Expo, co-located with Deck Expo.

INTERNATIONAL
POOL | SPA | PATIO
EXPO



CO-LOCATED WITH

deck EXPO



DIVE IN AND LEARN MORE
VIEW YOUR REGISTRATION OPTIONS AT:

www.poolspapatio.com

NOVEMBER 13-18

KAY BAILEY HUTCHISON CONVENTION CENTER
DALLAS, TEXAS



Screened Porch Under a Rooftop Deck

A poured stem-wall foundation provides a solid base for two-level, three-season outdoor living

by Kevin Lovejoy

Sometimes, a screened porch is an afterthought, a conversion of an open porch or a deck in an attempt to extract a little more outdoor living during the warmer months while keeping sun, rain, and bugs at bay. In this case, though, the screened porch was part of the original design of a 6,000-square-foot rural Vermont home and was completed simultaneously with the rest of the project. In addition to the three-season porch off the home's dining room on the lower level, there's a rooftop deck off the second-story master bedroom, above.

Foundation and Framing

Instead of being supported by piers, like most decks and porches, this deck bears

on a poured concrete stem-wall foundation. It was formed with a shallow shelf to help support veneer fieldstone cladding that matches the foundation detail used on the rest of the house.

Unlike the rest of the house, though, there's no insulated slab on top of the stem wall; instead, we installed an interior perimeter drain on top of the footing that runs out through the foundation to daylight, wrapped the drain with filter paper, and backfilled with sand and gravel. We left at least a foot of clearance between the top of the gravel and the bottom of the pressure-treated (PT) deck framing for air to circulate; any water that enters the porch and drains through the gaps between the decking has an es-

cape route through the foundation drain.

The 12-foot-by-15-foot porch deck is framed conventionally with 2x10 PT lumber, with solid blocking installed midspan. We hung the joists from a PT ledger fastened to the home's concrete stem wall with wedge anchors; at the other end, the joists bear on the mudsill capping the porch stem wall. Because of this foundation detail, which blocks insects and other pests from making a home beneath the deck framing, there was no need to apply any screening to the bottoms of the joists.

We framed the porch roof with 2x10 ceiling joists, setting them level to create a flat ceiling. To give the roof deck a shallow 1/4-inch-per-foot slope for drainage,

Screened Porch Under a Rooftop Deck



Figure 1. The screened porch was conventionally framed like a deck with pressure-treated lumber but supported by a poured concrete stem-wall foundation rather than posts or piers (A). The deck ledger was bolted to the home's concrete foundation with wedge anchors (B). Tapered rippings added to the ceiling joists (C, D) created the pitched roof deck (E).

we applied tapered rippings to the tops of the joists before installing the sheathing. Then the roofers installed rigid foam cover boards and rolled out an EPDM roof membrane, turning the membrane up the wall by about 16 inches.

We didn't want the deck on top of the roof to be pitched, though, so we ripped PT 2-by stock to create tapered sleepers with the same pitch that we had added to the ceiling joists, but installed them in reverse to create a flat roof deck. Before laying the sleepers on top of the roof membrane, we applied contact cement to their bottoms and laminated them with narrow EPDM strips to protect the roof membrane.

Decking

The homeowners selected decking that had been milled from black locust for the screened porch and upper-level deck, as well as for a number of the house's other porches and decks. This decking was sourced directly from the supplier, Robi Decking, which claims that black locust—a fast-growing, naturally rot-resistant North American hardwood—is a more sustainable alternative to slower-growing tropical hardwood decking.

This was our first encounter with this type of decking, which we found to be a little challenging to work with. One issue that we had with the $\frac{5}{4} \times 6$ decking is that it arrived from the supplier in random

lengths, with a considerable percentage of shorter 5- and 6-foot lengths in the mix. In addition, the Select & Better grading seemed to vary considerably, and we had to sort through the pile to mix and match boards that had reasonably consistent grain, knots, and coloring. These two factors contributed to a larger than average amount of waste.

We prefinished the decking on all four sides with Robi's proprietary recommended low-VOC penetrating oil finish, using the oil to treat cut ends as we installed the decking on both the lower screened porch and on the upper-level deck. Grooved decking for use with hidden fasteners is available, but we installed



A



B

Figure 2. Known more as a “fence post” wood because of its strength and rot-resistance, black locust can also be milled into decking (A). It features a prominent grain and golden color (B), which will eventually develop a silvery gray patina.



A



B

Figure 3. The porch fascia, posts, and eaves were trimmed with Boral TruExterior trim, which is made with fly-ash, a coal combustion by-product, mixed with polymers (A). The porch foundation received a fieldstone veneer finish (B).

square-edge boards, face-fastening the decking and picture-frame border to the framing with stainless steel screws. To allow for swelling of the kiln-dried boards after exposure to weather, we followed the manufacturer’s gapping recommendations.

Trim Details

We trimmed the porch with Boral TruExterior poly-ash trim, opting to expose the side with the wood-grain pattern rather than the smooth side. It’s rated for ground contact, making it a good fit for the fascia trim that is in close contact with the stone veneer applied to the stem-wall foundation.

After we finished trimming the porch

and the electrician roughed-in the wiring for the ceiling lighting, we blind-nailed prefinished 1x6 tongue-and-groove knotty pine ceiling boards to the joists. Because the owners have no plans to ever convert the space to four-season use, the ceiling is uninsulated.

Screen Details

To frame the openings for the screen panels and the porch’s two doors, we added six more 4x4 western-red-cedar posts to the three that were already supporting the roof system. We spaced and plumbed these posts carefully to frame square, equally sized openings. Then we added red cedar 2x4s between the posts at a typical rail height of 36 inches.

At the door openings, the 2x4s were installed at header height. On the interior and exterior, we clad the posts with 1x6 Boral trim.

To prep the openings for the aluminum-framed screen panels, which would be fabricated off site, we ripped 1½-inch-by-1½-inch stops from clear 2-by-red cedar stock, easing the edges of the stops with a round-over bit mounted in a router and sanding them smooth. After cutting the stops to length, we nailed off the exterior stops and loosely screwed the interior stops to the openings with stainless steel trim screws. Then we left the porch in the hands of the painters, who applied a dark finish to all of the porch trim to match that on the house. Later,

Screened Porch Under a Rooftop Deck



Figure 4. Additional 4x4 posts were installed to frame the openings for the screen panels and doors (A). Prior to screen installation, the trim was painted to match the trim on the rest of the house (B). Fixed (on the exterior) and removable (on the interior) red-cedar stops were added to the openings (C) in preparation for the aluminum screen panels (D, E).



Figure 5. The rooftop deck has a custom-fabricated iron railing with a dark finish to match the home's color scheme.

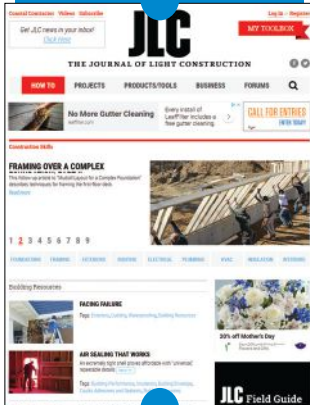
after most of the work on the house was completed and the risk of damage was minimal, the screen fabricator returned to install the screens.

Rooftop Deck

After we had wrapped up the siding work on the house, a crew returned with a man-lift and the parts to complete the assembly of the iron railing on the upper deck. They had already custom-fabricated and painted the front and side panels off site, so all they had to do was lift the panels onto the roof, bolt them in place, weld the corners together and grind them smooth, and then touch them up with paint. ❖

Kevin Lovejoy owns Kevin Lovejoy Building and Remodeling, in Westford, Vt.

JLC



JLConline.com offers sound technical advice, practical how-to articles, expert hosted forums, as well as networking opportunities.

Zonda Media



Save Time, Labor and Hassle

FootingPad® structural post foundations are engineered to meet or exceed the load capacity of concrete, while reducing hassle, time, and labor costs.

Available in 5 sizes from 10" to 24"

NO CONCRETE REQUIRED!

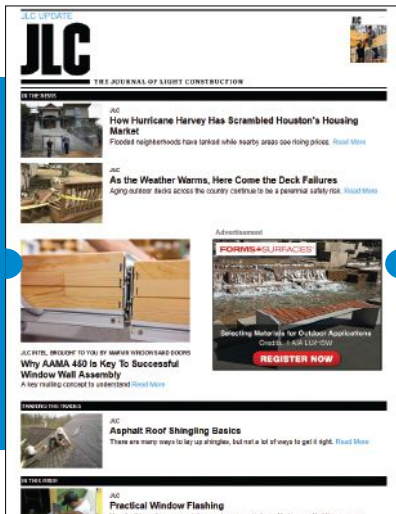
EASY TO HANDLE

ICC **ES** ICC Building Code Compliant ESR-2147

Learn more or request a sample at Footingpad.com or call us at 989-224-7095



JLC



JLC Update the source for information to help pros improve job performance—including hands-on job tips about the best materials and techniques, industry news and product trends. Sign up now at jlonline.com.

Zonda Media

DAY'S END

Focus on good design and clever construction



An Accessible Spa

by Sean Collinsgru

With their daughter confined to a wheelchair, the homeowners asked us to build their new deck flush with the door threshold to be wheelchair-accessible from the house. Their goal? An outdoor living space with a modern layout and simple, clean lines that included an outdoor kitchen and a hot tub.

We proposed building the hot tub into the deck for accessibility, but also so that it looked like part of the design. To maximize seating and enhance functionality, the design includes a bench seat adjacent to the hot tub that also serves as a place to set drinks.

After framing the deck (A), we formed and poured a 4-inch-thick concrete slab

on top of a compacted crushed stone sub-grade base to support the tub (B). One of the biggest challenges in framing this project was leaving access to the hot tub's operating parts for maintenance and service, which we solved by designing a liftable hatch on the lower deck (C). Power is supplied by a subpanel next to the hot tub, with an emergency shutoff nearby. We mounted the shutoff on the front side of the deck where it would be both code-compliant and less obtrusive.

While the hot tub has a full lighting package that provides adequate illumination around the area, we also fitted the risers with LED puck lights, which by code need to be at least 5 feet from the hot

tub. A simple overhead beam design adds vertical elements to the space for mostly aesthetic purposes but also includes a misting system to keep the deck cool in the summer and serves as a great mounting point for overhead string lights.

To complete the design, we installed Deckorators Voyage mineral-based composite decking, choosing earth tone colors to soften the modern look. A black-textured aluminum railing, which matches the painted black overhead beams, adds a contemporary flair. ❖

Sean Collinsgru owns Premier Outdoor Living in Palmyra, N.J. You can follow him on Instagram at @premieroutdoor.

PHOTOS BY SEAN COLLINSGRU

PARTNERED:
Tripartite House
Intexure Architects

Houston, TX

TAMLYN[®]
FAMILY. VALUE. SERVICE.

TAMLYN's quality aluminum products come in a wide range of color and design options. XtremeTrim[®] and XtremeInterior[™] allow builders and architects to imagine beyond the barriers of design for multi-family, single-family and commercial projects.

TAMLYN is proud to be a manufacturer that listens to our clients to ensure we exceed industry expectations in manufacturing, innovation and service. We stay committed to our customers, so they can stay committed to the community.



Profile: BRV / RVBD



Profile: F



Profile: BRH



Profile: XOCLP / CALP

FAMILY. VALUE. SERVICE.

WATER MANAGEMENT | XTREMEINTERIOR[™] | XTREMETRIM[®] | XTREMECOLOR[™] FLASHING | SIDING ACCESSORIES | VENTILATION | METAL FLASHING | CONNECTORS

Phone: (800) 334-1676 | E-mail: info@tamlyn.com

www.tamlyn.com



GIVE YOUR BUSINESS MORE HORSEPOWER.

Get the most powerful training tool in the business.

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

JLC

FIELD GUIDE

BY VINCENT SALANDRO



1. All-in-One Deck Railing System

DekPro Prestige railing is available in a textured powder-coat finish in four colors for both residential and commercial applications. Engineered to meet national building codes, the railing comes packaged with everything needed for installation. Residential rail kits are 38 inches high with a 3 1/4-inch sweep and balusters are standard 32- and 36-inch lengths. Pricing varies based on distributor. dekpromfg.com



2. Gypsum Panel Tile Backer

CertainTeed's gypsum GlasRoc Tile Backer and GlasRoc Tile Backer Type X panels feature a moisture-resistant core with engineered fiberglass faces, making them ideal for use behind tiles in rooms subject to moisture and high humidity. GlasRoc Tile Backer cuts and snaps like standard gypsum panels and weighs less than standard cement backer boards, according to CertainTeed. The 4-foot-by-8-foot panels are available in 1/2- and 5/8-inch thicknesses. GlasRoc Tile Backer Type X (5/8 inch only) features a core formulated for use in UL and ULC fire resistance-rated designs. Contact a distributor for pricing. certainteed.com



3. Fluid-Applied Water Management Membrane

Laticrete's Masonry Veneer Installation System (MVIS) Water Crack Isolation (WCI) enhances longevity of the building assembly when used with air-barrier systems, according to the manufacturer. The single-component, fluid-applied, bulk-water-management membrane is load bearing and nonflammable, and produces a monolithic elastomeric coating that bonds directly to concrete and cement-backer-board substrates. MVIS WCI is available in 5-gallon pails. Pricing varies by distributor and job scale. laticrete.com

4. Heavy-Duty Self-Closing Gate Hinge

The TruClose Round Heavy Duty line of adjustable, self-closing hinges for round-post gates and fences includes two hinge options that self-close gates up to 154 pounds from a complete 180-degree swing. The hinges are UV-stabilized and engineered with industrial-strength polymer. According to D&D Technologies, the product will not rust, bind, sag, or stain over time. Each hinge is backed by a lifetime warranty and retails for approximately \$50. us.ddtech.com

Products

5. Single-Layer Roofing Underlayment

Boral Acrilay roofing underlayment combines SBS-modified asphalt with an acrylic adhesive for a single-layer system that Boral says offers better adhesion than options using asphalt-based adhesives. The underlayment provides protection from weather, does not require special installation equipment, and is compatible for use with clay, concrete, stone-coated steel, composite roofing, and asphalt shingles, including on steep-slope applications. Boral says the underlayment will not rapidly degrade or crack over time. It's offered in 39 ³/₈-inch-by-61-foot rolls. Pricing varies. boralamerica.com



6. Smart Technology Ceiling Fan

The Wynd XL Smart Fan from Modern Forms features a weather-resistant nine-blade configuration with a 72-inch sweep. The fan is compatible with Modern Forms LED luminaires in 2700K, 3000K, and 3500K color temperatures and is powered with a quiet DC motor. The fixture's durable aluminum hardware makes it suitable for outdoor as well as indoor use. The Energy Star-rated fan is available in four finishes and pairs with smart home devices, according to Modern Forms. The product retails for approximately \$600. modernforms.com



7. Pull-Down LED Lighting

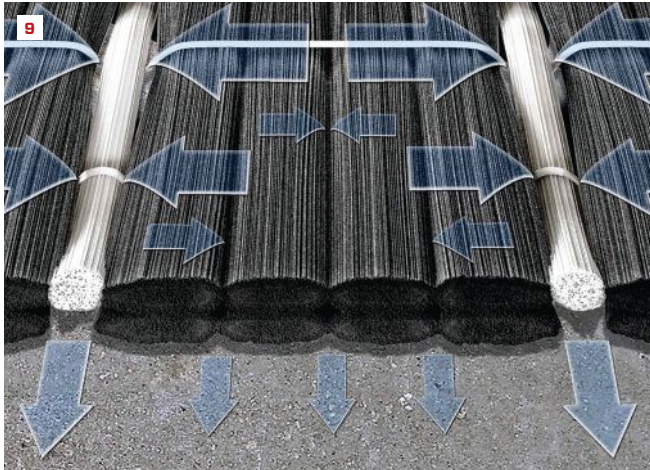
Nora Lighting's adjustable Multiple Lighting System (MLS) Pull-Down LED Series is now offered as a trimless or flanged fixture, in a one-light square and two- and three-light units. Fixtures can be installed in existing drywall ceilings or can be roughed-in for new construction with an optional frame-in. Each MLS LED module adjusts 359 degrees horizontally and 85 degrees vertically when fully extended, and each produces 2100 lumens, with color temperature options of 2700K, 3000K, 3500K, and 4000K. Retail price is around \$600. norahlighting.com



8. Retrofit Bidet

Fluidmaster's Soft Spa 9500 Bidet features water temperature and pressure controls, adjustable dryer speeds, an ergonomic, temperature-controlled seat, a night light, and a soft-close lid, along with a deodorizer and push-button quick release for easy cleaning. The bidet, with a suggested retail price of \$400, can be retrofitted to an existing toilet. fluidmaster.com





9. Concrete Repair FRP

Simpson Strong-Tie's 44-ounce CSS CUCF44F carbon fiber-reinforced polymer (FRP) fabric is reportedly the heaviest code-listed option, so fewer built-up layers are needed and it can be installed more quickly than lighter fabrics, according to the manufacturer. FRP fabrics are used as a noncorrosive method of repairing and upgrading the structural capacity of slabs, beams, walls, new wall openings, columns, and piers, to name some of the applications for this type of retrofit reinforcing. Contact distributor for pricing. strongtie.com



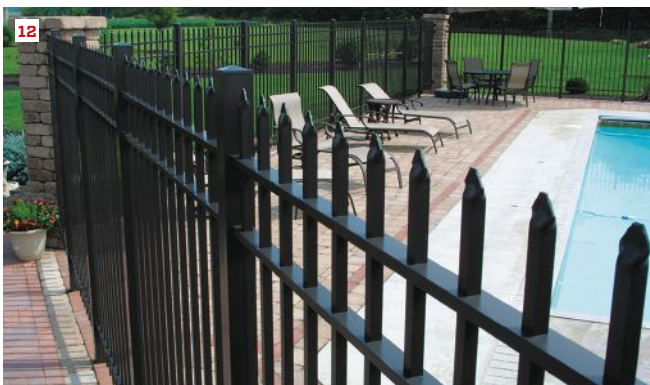
10. MgO Subfloor

Exacor Magnesium-Oxide (MgO) structural panels offer fire resistance and acoustical performance in multifamily and light-commercial flooring assemblies. According to Huber Engineered Woods, using Exacor can help reduce material needs and labor time compared with floor assemblies that require gypsum underlayment. Available in 1/2-inch, 5/8-inch, and 3/4-inch nominal thickness options, the panels can be used as a subfloor underlayment over traditional OSB or plywood and as a structural subfloor. Contact a sales representative for pricing information. huberwood.com/exacor



11. Level- and Stair-Run Cable Braces

RailFX's aluminum cable brace for level and stair runs can be used between structural posts to reduce cable deflection. For level runs, the aluminum cable brace is a 5/8-inch-by-5/8-inch, 42-inch-long square tube that can be cut down to any size; it comes predrilled with 12 holes at 3 1/8 inches on-center. For stair runs, the cable braces are 50 inches long and are available both in a predrilled, 12-hole option and in an undrilled option that can be customized to match the cable angle. Contact a local distributor for pricing. railfx.net



12. Aluminum Pool Fencing

Series 7000 aluminum picket fencing from Superior Aluminum Products meets OSHA, ADA, and ICC safety criteria and is virtually maintenance-free, according to the manufacturer. Ideal for use around pools, the fencing is available with a range of customizable design options and PPG Duracron colors. The product ships in preassembled sections to speed installation. Pricing varies by project. superioraluminum.com



Coastal Contractor Videos Subscribe

Get JLC news in your inbox! [Click Here](#)

JLC Login Register

MY TOOLBOX

THE JOURNAL OF LIGHT CONSTRUCTION

HOW TO PROJECTS PRODUCTS/TOOLS BUSINESS FORUMS


Ipe Oil EASY APPLICATION. EXCEPTIONAL RESULTS DeckWise metrostudy

Construction Skills

CONCRETE BASICS

Concrete seems about as straightforward and rugged as any material on site. But the fact is, if you make certain common mistakes during placement, you can end up with a weak finished product. Here are some essential guidelines that will guarantee good work.

[Read more](#)



1 2 3 4 5 6 7 8 9

FOUNDATIONS FRAMING EXTERIORS ROOFING ELECTRICAL PLUMBING HVAC INSULATION INTERIORS


Building Resources

INSTALLING PREFINISHED STRIP FLOORING

Skip the sanding but take more time for a careful install

[Read more](#)

Tags: Flooring, Carpentry, Wood




RETHINKING WINDOW FLASHING

Flashing windows the 'right way' requires three sets of instructions - for the...


[Read more](#)

Tags: Windows, Flashing, Exterior



Construction Workforce

Online Training Allowed for Lead Paint Recertification



JLConline.com offers sound technical advice, practical how-to articles, expert hosted forums, as well as networking opportunities.

Weigh In!

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



TOOLS

OF THE TRADE



Photos by Tommie Mullaney

Makita's GDT01 impact driver and GPH01 hammer driver-drill are both powered by the company's new 40-volt XGT battery platform. The high-torque impact driver has four speeds and multiple modes to fine-tune the tool to the application (top), while the drill-driver has the power to drive large bits through thick stock (bottom).

Makita Max XGT 40-Volt Drill/Driver Combo

BY TOMMIE MULLANEY

Drill/drivers are an essential part of a tool kit for any carpenter, even one who specializes in fine woodworking and trim carpentry, as I do. So when I had the opportunity, I was eager to test drive Makita's new 40-volt XGT drill/driver combo.

XGT IMPACT DRIVER

Cordless tools are rapidly becoming more advanced and powerful, and Makita's new four-speed impact driver (GDT01) is no exception. It has some impressive intuitive features and buttons (in fact, I was slightly overwhelmed by the number of operational modes, which I will get to in a bit). The GDT01 has a brushless motor that transfers 1,950 inch-pounds of max torque at the squeeze of the trigger, the most torque I've seen from a 1/4-inch impact driver. With its multiple speed settings, you can match the torque and speed to specific applications. Another feature is something that Makita calls Extreme Protection Technology (XPT), which it claims provides increased protection against dust and water. In the hand, the GDT01 feels great, a lightweight and compact tool (despite the horsepower) that can fit into some tight spaces. One of my favorite features on this driver is the one-touch four-speed power selector button just above the trigger, which made adjusting modes fast and easy with one hand. In speed 4, for example, it was almost comical how quickly (and powerfully) the driver could set a 2-inch-long screw.

As mentioned above, this impact driver's technology was slightly overwhelming at first. While the driver has four speeds, it also offers eight modes, which Makita refers to as half-modes. I had to refer to the user manual to figure out how to use this feature, and for what applications; even then, it will take some time before the modes and half-modes become intuitive. And the GDT01 is missing one feature I've found to be convenient on other impact drivers I've used: a magnetic bit holder.

XGT HAMMER DRIVER-DRILL

The matching XGT 1/2-inch hammer driver-drill (GPH01) has three modes, two speeds, and 1,250 inch-pounds of torque. To switch modes, twist the dial just behind the all-metal keyless chuck: Mode 1 is a regular drill mode; mode 2 is hammer mode, suitable for drilling into masonry; and mode 3 is the electronic digital clutch mode. When you switch to mode 3, a small screen lights up at the base of the drill, displaying a number, which allows you to quickly and accurately dial in your exact torque setting—41 settings are available in low speed, and 21 in high speed—as you use the scroll wheel. Again, I had to refer to the user's manual to figure out



The author used Makita's Impact XPS bits during testing, which the company says last much longer than standard bits thanks to the carbon alloy steel used in their construction.

exactly what each number represented in torque settings, though this was easier to understand than the GDT01 impact driver settings. My favorite feature is the drill's Active-Feedback sensing technology, which turns the motor off if rotation of the accessory is suddenly forced to stop.

The GPH01 feels a little heavy in the hand, even with the 2.5-Ah battery, and it's also top heavy, so balancing this drill on an uneven surface is difficult. However, I did appreciate this weight when drilling horizontally, especially when using large-diameter self-feeding bits. With a 2⁹/₁₆-inch bit chucked in and the drill in speed setting 1, the GPH01 plunged through 2x4 pine with ease, showing me that it was made with torque in mind.

GT200D KIT

Supplied with this kit was an XGT Rapid Charger, which has dual fans that circulate air through the charger and battery, resulting in faster charging times; it can fully charge a 2.5-Ah battery in 28 minutes or less. Like most tool brands these days, Makita includes a zippered bag with this kit; I'd prefer a hard case, because it makes it easier to stay clean and organized—and won't rip. The GT200D kit includes the two tools, two 2.5-Ah batteries, charger, and bag; it comes with a three-year limited warranty and costs \$450. makitatools.com

Tommie Mullaney owns Mullaney Woodworks in Naples, Fla. You can visit his web page at mullaneywoodworks.com or follow him on Instagram at [@mullaneywoodworks](https://www.instagram.com/mullaneywoodworks).

Evolution R255SMS+ Single Bevel Sliding Miter Saw

BY MARK CLEMENT

Evolution Power Tools' R255SMS+ 10-inch single-bevel sliding miter saw took what I call a "pinball path" to my shop, where it's here to stay after a bit of a rocky start. Part of the initial allure of its "multi-material"—steel, soft metals, wood, plastic—cutting claim was my disdain for the cutting skills of some of the plumbers I've worked with. So, I thought, let's give it a try. But I'm a carpenter, not a plumber, so wood was first on the list.

Out of the box, the saw comes in four pieces, but assembly was easy, resulting in a sublimely accurate setup. My first project was a deck resurfacing job involving tooothing in multiple new 5/4x6 pressure treated boards. The cuts were clean, there was plenty of power, and the tool operated as it should. However, my love affair with this delightfully light, mobile, easy-to-use saw started to ebb. The only place dust didn't collect was in the bag. The piles of sawdust got so big around the fence and table that it actually got onto the rail stops, and the blade couldn't travel all the way through a cut. On a trim job, I couldn't cut 5¹/₂-inch ogee base nested, so there was beveling to be done, and I rued the day I let my old 12-inch SCMS go. Still, cuts were accurate, and with a smaller volume of dust from the thinner material to manage, it was easier to use. And it has a soft start—really soft, like, is the thing ever going to hit full rpm? For dialing in miters, cheating the saw up to the cut line, or doing any other on-off activity, this feature became annoying enough that when a new saw came along, I stowed the Evolution in a corner, thinking somebody would like it.

Then I had a project installing powder-coated aluminum track and balusters for deck rails. Without changing the multi-material cutting blade that comes with the saw, I found that cuts were clean and the chips were much better contained in the Evolution's continuous blade guard than with other saws I've used to cut aluminum. I subsequently used the Evolution on a variety of remodeling projects and became re-enamored with this versatile saw, because it is extremely light and easy to move—both to the site and around in the truck. Also, unlike other blades I've used cutting metals, the included Evolution blade is still running strong. This is a unique and interesting saw that is a bargain at \$250 direct from the manufacturer and, at the very least, is a great backup to a main frame miter saw. store.evolutionpowertools.com.



The Evolution R255SMS+ single bevel sliding miter saw has a maximum crosscutting capacity of 11³/₄ by 3⁹/₁₆ inches and weighs less than 34 pounds. The 14-amp motor has a soft-start feature and turns at 2,500 rpm.

Mark Clement is a member of the JLC Live Demonstration team, author of The Carpenter's Notebook, A Novel, and a deck builder/remodeler in Ambler, Pa.

Photo by Mark Clement

Bosch Second-Gen Blaze Laser Distance Measurer

BY MARY SALMONSEN

Bosch second-generation Blaze Models GLM165-25G and GLM165-27CG laser measures feature a green-beam laser, which Bosch says creates a dot up to four times brighter than red beams. With a range of up to 165 feet, the laser measures are equipped with new and improved features, including an inclinometer that shows the tilt angle up to 360 degrees for easy angle and indirect measurements, Bluetooth functionality (on the GLM165-27CG), and full rubber-over-mold casings to protect impact points on the IP65-rated body. Users can select between 11 different measuring functions, including tape measure mode, length, area, volume, and addition/subtraction capability. The dual-power device is able to run on either two standard AA batteries or a GLM-BAT lithium-ion battery pack.

Each measure features an easy-to-read backlit color display user interface, as well as a belt clip. New settings include a haptic feedback feature for successful or failed measurements, where the tool vibrates for measuring confirmation on loud jobsites; a battery save



mode that reduces the brightness of the user interface and deactivates audio and haptic feedback; and an option to clear all saved measurements. The animation function creates graphics to convey how measuring functions are used, and the storage usage data function saves progress even if the tool is switched off. Prices range from \$130 to \$170. boschtools.com

Mary Salmonsen is an associate editor for Builder magazine.

Viking Arm Handheld Jack

BY CHRIS LAND

Working in construction for more than 20 years, I've seen a number of tools, but rarely have I come across one that is a game-changer like the Viking Arm. Made in Norway from hardened stainless steel and aluminum, this compact but strong handheld jack has a lifting capacity of 330 pounds and a range of motion from 1/4 inch to 8 1/2 inches. Weighing only 3 pounds per device, a pair of Viking Arms and several bundles of shims fit inside a milk crate.

Lifting or spreading action is achieved by squeezing the all-metal handle, but where this tool really shines is in its precision lowering capability. Push the right trigger and the tool drops for a full release; for precision lowering, depress the left trigger. You will not get this control with a typical squeeze clamp tool. The Viking Arm can also be used as a clamp by removing a set screw and swapping the ratcheting mechanism around on the shaft.

Much of my work lately involves kitchens and baths, and I use a Viking Arm daily to level base cabinets prior to granite countertop installation. I just place the device under the face frame of the cabinet toe kick, and with precision, I can raise or lower a cabinet to match my laser level. It works on upper cabinets, too, with scrap-wood spacer blocks. I also use the Viking Arm to raise heavy cast-iron double sinks out of countertops. This is normally a two-person job, but with a Viking Arm, one person can safely raise the sink without throwing out their back. For lifting, pressing, tightening, and leveling, this is a quality tool that is worth its \$200 price tag—but buy two. I got mine at massaproducts.com.

Chris Land owns Cutting Edge Home Repair in Greenback, Tenn. Follow him on Instagram at [@cuttingedgehomerepair](https://www.instagram.com/cuttingedgehomerepair).



The Viking Arm can be used to both raise and lower heavy items such as cast iron sinks and cabinets with control and precision (above). The right trigger fully releases the tool; use the left trigger for controlled lowering action (left).

Photos of Viking Arm by Chris Land

SCRATCH PROTECTION
The thickest, toughest, protective coating for tubs, whirlpools, and shower stalls.

Protective Products
International Inc.
Surface Protection Solutions

ProtectiveProducts.com
(800) 789-6633

ASTROflashing
The Ultimate Bendable Head Flashing

1-800-334-4474
www.astroplastics.com

Patent Pending

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

Contact:

Paul Tourbaf | 847.778.9863 | ptourbaf@zondahome.com

JLC

Content
Licensing
for Every
Marketing
Strategy



Marketing solutions **fit for:**

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

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

Contact Wright's Media at:
Phone: 877.652.5295

Web: info.wrightsmmedia.com/zonda-licensing-permissions

Email: zonda@wrightsmmedia.com

July/August Advertising Index

Advertiser	Page #
3M Construction & Home Improvement Division	7, 9
ABC Supply Company	C3
Advanced Building Products	14
Astro Plastics	58
Atlantis Rail Systems	PDB 15
Behr Paint Company	19
Chief Architect	C2
Cost vs Value 2021	32
Deckorators	PDB 5
DeckWise	PDB 15
Diablo Tools	28, Belly Band
FastenMaster	PDB 6
Festool	13
Fiberon	10
FootingPad by AG-CO	PDB 27
Georgia-Pacific Corporation	C4
Grabber Construction Products	PDB 13
International Pool Spa Patio Expo™	PDB 22
Invis-A-Rail	PDB 21
JLC Field Guide	50 *
JLC Online	54 *
Key-Link Fencing & Railing	PDB 9
KILZ	39
Lonza Wood Protection	PDB 16
Malco Products	48
MiTek	24
Norton Saint-Gobain Abrasives	40
Protective Products	58
Simpson Strong-Tie	4
Tamlyn	49
Trex	PDB 2
Trus Joist by Weyerhaeuser	50 *, 54 *
TYPAR	20
Walpole Outdoors	12
YellaWood	PDB 11
ZIP System by Huber Engineered Woods	27
ZipWall	23

*Advertising appears in regional editions

BY RYAN KUSHNER

Fancy Foyer Floor

The homeowners planned to turn their entire home into “one huge piece of art,” complete with decorative furniture and elaborate wallpaper, says Matthew Szyszka of Chicago-based FloorMaster US Co. So when they switched gears at the last minute and asked Szyszka to install “something cool” in the 110-square-foot foyer, Szyszka wanted to make sure the wood floor would hold its own among the elaborate decor in store for the home.

“I came back to my garage, scratching my head—I wanted to do something special,” Szyszka says. “I thought, ‘The floor needs to pop out among all those things.’” Szyszka spent half a night sketching out ideas and landed on a white oak and walnut chevron for the space, with a black-stained border of the same woods. He started off his pitch the next day by showing the clients a plain chevron, which they liked; then he said, “Hold on,” and busted out the walnut, which outlines the wider oak chevron, and the homeowners were ecstatic. The rest of the house would feature regular 3¼-inch white oak to replace 1,000 square feet of ceramic tile.

Szyszka’s supplier told him the chevron white oak boards and 1-inch-wide walnut strips would require a two- to four-week wait time. “I was like, ‘No way,’” Szyszka says. Instead, he took some available 5-inch white oak and 2¼-inch walnut boards and milled them himself using a miter saw, table saw, and router. “Pretty simple, but a lot of cutting,” he laughs. “Every single piece went through my hands.”

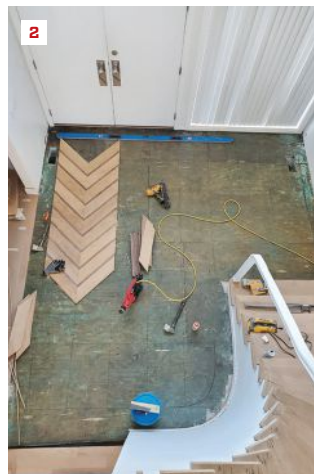
With the tile removed during demo, and the foyer thoroughly measured, and the flooring cut, Szyszka and his crew began installing the field of walnut and white oak with glue and nails. Once the field was installed, they cut in the walnut and white oak border using a track saw for the straight lines and a router for the radius near the staircase.

For the radius border, Szyszka cut ¼-inch boards, glued them together, and clamped them overnight. “I wanted the grain to match because of the ceruse,” he says, referring to the finish technique that highlights the grain of the wood with a lighter color. “It was fun.”

They sanded the floor with 80-, 100-, and 120-grit, then treated the border and stair treads with a black pre-color. They wrapped up the floor and stairs with a coat of hardwax oil. “The cool thing is that the grain color in the floor, border, and stairs all match,” Szyszka says. “It gives that a nice transition, nice flow.” Szyszka and his team also upgraded all the baseboards in the home and installed the staircase’s spindles.

When the foyer was completed, Szyszka walked away knowing he’d created a floor worthy of a home focused on art.

This is an edited version of an article that originally appeared in Wood Floor Business, where Ryan Kushner is an assistant editor.



The walnut and white oak chevron pattern of this finished floor (1) was created by Matt Szyszka, who milled the wide white oak and thinner walnut strips in his shop (2). After installing the field flooring, he and his crew glued up the curved section of the walnut border, laminating it around a plywood form (3). To install the border, they then cut out the flooring using a track saw on the straight sections and a router for the curved section near the staircase (4).

Photos by Matthew Szyszka of FloorMaster US Co./courtesy Wood Floor Business



ORDER ON THE GO WITH *myABCsupply*

Your job just got easier,
wherever your projects
take you.

- ✓ 24/7 online ordering
- ✓ Create templates for frequently ordered items
- ✓ Track orders and deliveries
- ✓ Available in Spanish and Polish
- ✓ Find an ABC location near you



Scan to sign up today!

“Perfect app for keeping track of all orders, deliveries and purchases. One less thing to worry about.”



- Stars and Stripes Roofing LLC
Allegan, Michigan

»» DOWNLOAD THE APP



BRING IT ON

Weather delays are no match for **Georgia-Pacific's** smarter sheathing system.

You've always trusted Georgia-Pacific to protect your multifamily buildings with DensElement® Barrier System. That's why we developed a sheathing system that delivers the same level of quality and durability for your wood-framed building needs.

The ForceField® Weather Barrier System provides superior protection from air and water, starting with panels that consist of structural sheathing, moisture-resistant resins* and an enhanced* overlay for a 3-in-1 solution. Then, premium accessories treat seams and joints to complete the system. It's the high performance you expect from Georgia-Pacific—and that Mother Nature never saw coming.

Learn more at [GPForceField.com/MultiFamily](https://www.gpforcefield.com/MultiFamily)

*Features described here may not be available in all geographic markets. Consult your Georgia-Pacific company representative for more information.

©2021 Georgia-Pacific. All rights reserved. Unless otherwise noted, all trademarks are owned by or licensed to GP Gypsum LLC.



**Enhanced*
Overlay**



**Moisture-Resistant
Resins Using
DryGuard®
Technology***



**Structural
Sheathing**



**ForceField®
Seam Tape Plus**

