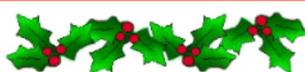


CAHI MONTHLY NEWS



Presidents Corner



Its December and the holiday season is upon us. Everybody is trying to get into the holiday spirit. We have been through a lot in 2020. A two week shut down to stave off a novel virus has turned into a world wide pandemic that is still with us nine months later. But we will still get into the spirit. Businesses and professions muddled through the phased re-opening. Most barely surviving at best, some in dire straights. But we will still get into the spirit. Protests and rioting, defund police, change shortage and of course, a crazy presidential election...but we will still get into the spirit. Because that is what a strong society does. It does not give in or give up. It keeps its head up and pushes through the obstacles. Those who believe and push forward will overcome.

As an organization CAHI will push through and provide the best service to our members as we can during these challenging times. Our first two simul-cast meetings went relatively well. There are still some bugs to work out, but it will be like tweaking a home inspection software system...that's what we do. A huge thanks to Jim Enowitch, our tech guru for pulling it all together, Scott Monforte and our speakers for rolling with the punches, and the rest of the board who diligently dedicate their time for free to this organization...and of course to the members that support us while we work things out.

Don't let your spirit or your guard down this holiday season. Take care of yourself and your family. Sacrificing this holiday season will ensure many celebrations to come. We have gotten this far we can make it through to the end. Take care of your community when you can. Together, we can all be stronger.

Continued on pg 2

MONTHLY MEETINGS – Details & Info

CAHI's regular monthly meetings are held at the Best Western located at 201 Washington Ave (RT 5), North Haven. Meetings are also broadcast via Zoom.

Meetings are still free to members but RESERVATIONS are a MUST.

Reservations can be made at our CAHI website.

Most meetings are on the fourth Wednesday of the month from 7-9pm. Guests are always welcome! Guests may attend 2 free monthly meetings to experience our presentations, meet our members, and receive a CE attendance certificate. Joining CAHI may be done at anytime of the year through our Membership Page.

December 2020 Volume 13, Issue 12

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Meeting Dates!

Meetings have Resumed!

.....

December 16th

Private Wells & Water Quality

Presented by:

Jeremiah Weid from JH Barlow

.....

January 27th

TBD

Presidents Message Continued:

The CAHI board wishes you the best this holiday season, whether you celebrate Christmas, Hanukkah, Kwanzaa, Winter Solstice, Chinese New Years or any other. We all wish you a safe, happy and better 2021!

Stan

“You never know what’s around the corner. It could be everything. Or it could be nothing. You keep putting one foot in front of the other, and then one day you look back and you’ve climbed a mountain.”

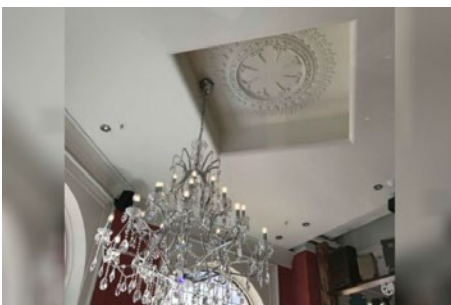
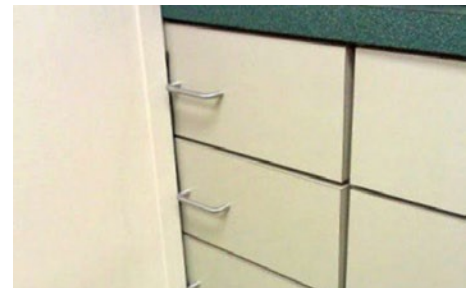
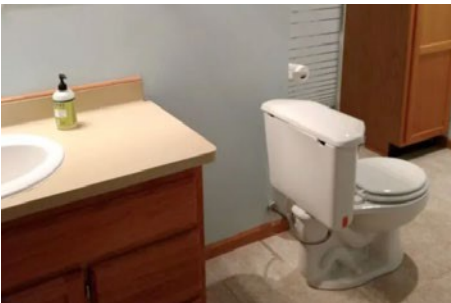
— Tom Hiddleston



Ridiculous Home Design Failures That Should Have Been So Obvious

By Kelsey Nighthawk

The following images show interesting examples of home design projects that would cause most inspectors to do a double-take. Click [HERE](#) to view the online article.





10 Tax Tips for Small Businesses

WalletGenius Staff

Published on September 30, 2020

10 Tax Tips for Freelancers and Contract Employees

What could be better than owning a small business? You get to make important business decisions, but without the pressure of running a gigantic behemoth corporation. You get to lead a few employees with benevolence and wisdom. You get to panic come tax time when you realize that what the government is asking for is more than you planned — and you're the one in charge of figuring out how to make it work.

Tax CreditsTax ReturnsTax DeductionsOnline Tax Help

So perhaps it's not all fun and games. But in the next few pages, we'll explore some tips to make your small business feel a little more substantial during tax season. From tax breaks to organizational tips, there's no reason to dread April — we've got you covered!

10. Get a Good Accounting System

Want to avoid taxes altogether? If you're looking for a surefire way to turn your small business into a failed business, be sure to ignore the basics of accounting and bookkeeping. With your business run into the ground, your taxes will be a cinch. (Well, next year maybe.)

In all seriousness, there's no simpler way to start off on the right tax foot than to simply keep track of what you're making and spending. Because small business are able to itemize a lot of expenses, it's also very wise to make sure that you have records and receipts for any of the costs you'd like to write off. That doesn't mean jamming flimsy pieces of register tape into your junk drawer; scan and digitally file your expenses. If the IRS audit team comes knocking, you'll be able to show them an organized, legitimate paper trail.

9. Capital Expenses

Obviously, you're not allowed to ask the government to pay you back for the normal costs of operating a business. Sure, you can deduct some of the expenses you have, but clearly you gotta wait until you're actually running the business.

Or do you? Turns out that the first year you start up your business, you can actually deduct \$5,000 in capital expenses. ("Capital," in this case, basically means they're not current expenses.) That sound broad? It kind of is. Basically, any cost you incur while creating or investigating a business might count. If you paid for advertising, market surveys — even wages for employees — before the launch of your business, you can take that \$5,000. Any amount over \$5,000 might be deductible as well, but you'll have to amortize it over the course of several years [source: IRS].

8. Hire Your Kids

We're not talking about forcing adolescents into factories here. We're actually just suggesting you to add some economic stimulus to your own household by hiring your own children. Nope, it's not just because it seems like a nice thing to do; it really can help ease the tax burden on a small business.

Here's the thing: You have to give them a reasonable wage, but you don't have to pay Social Security or federal unemployment tax if they're under a certain age. (Keep wages low enough, and they don't have to file income taxes in general.) You can even say that their wages are, say, just enough to cover that phone bill you pay for them every month. They get to work to pay off the phone bill, and you're not taxed on it as ordinary income. Keep in mind, however, that you have to run a sole proprietorship — or a partnership with your spouse — in order for this to work.

7. Hire Your Spouse

Here's another way to keep business in the family. Perhaps being a small business owner is a nice way to become closer to your husband — by giving him a job. It's not just kind of you, or a way to make sure you both get the same time off during the holidays. Hiring a spouse can actually work extremely well in your tax favor if you're willing to offer your loved one a few perks.

That doesn't mean a corner office and morning doughnuts. (The day buying doughnuts becomes a tax write-off is the day I quit doing any work besides buying doughnuts.) It's actually the opposite of doughnuts that's going to help you save some money: If you hire your spouse and offer him or her health insurance, you can deduct those payments on your taxes. Which sounds great — being able to write off your spouse's health insurance seems nice — but what's the big deal? Well, consider that a health insurance plan can include not only the employee, but the employee's family. Suddenly, you're able to write off your spouse's insurance, your insurance and your kids' insurance [source: TIME].

6. Affordable Care Act Credit

When the Affordable Care Act was introduced, there was a lot of talk about how it would affect small business owners and their bottom line. Nobody wanted to bleed small business owners dry, so tax credits were introduced in the bill to relieve the cost of healthcare.

In 2014, a small business owner can qualify for a 50-percent deduction if the business employs fewer than 25 employees with average annual wages of less than \$50,000 and contributes at least 50 percent to employees' self-only health premiums. You do need to make sure your employees are purchasing insurance in the Small Business Health Options Program Marketplace, but it's a huge credit for any business that qualifies.

5. Section 179

Section 179 is a rock star deduction. Not that you can actually deduct the cost of leather pants and sunglasses, but this is just the kind of deduction that small business owners scream for. To understand why it's cool, you should understand how most expense deductions work — very slowly. A lot of expenses are subject to depreciation, meaning that you can only write off their cost over a certain number of years. So sure, you can deduct the full price of that laser printer, but only over the course of its five-year life-span — which is all fine and good if you're looking to lower your taxes a little every year.

But what if you want to deduct the full price that year? Section 179 lets you. Well, it lets you deduct up to \$25,000, provided the equipment you're expensing meets the requirements. Off-the-shelf computer software counts; land doesn't. There are a lot of exceptions and rules for the Section 179 deduction, so do read up on it to discover if there are loads of deductions you can write off all at once.

4. Charitable Stock Donation

You're a good person, right? That's probably why your small business donates to charity. You want to help the kids, the animals or the Earth. So you hand over a check, and then you giddily deduct the amount from your taxes. (You want to help the kids, the animals and the Earth, but you also want to help yourself out. No shame in that.)

Consider going about it a different way. Instead of giving away a check or cash, you might want to think about donating stock. While it may seem pretty fancy for a small business owner, it's a smart idea. You can deduct the current worth of the stock on your taxes rather than what you paid for it. Does that actually work out to be a good deal? It absolutely could be, if you plan it right. Say you bought stock a year ago for \$250. You donate a share of that stock to a charity. By tax time, the share has doubled — and you can write that doubled value on your tax return.

3. Small Business Jobs Act Credits

In 2010, President Obama signed the Small Business Jobs Act into law. The act provided a whole slew of benefits for small businesses, like providing more money for small business loans and incentives for exporters [source: Lamoreaux]. It also introduced some new tax cuts for small business owners.

The cuts run the gamut, and it's wise to look through the list to make sure you're taking advantage of every program you can. For instance, certain small business investments are subject to zero capital gains taxes. Self-employed people can deduct health insurance costs. Even something as simple as the fact that cell phones — formerly seen as "listed property" and deductible with certain recordkeeping — are now much easier to write off for small businesses. Even relief from a penalty for tax errors is included in the act: It's based on a percentage of taxes now, not a flat dollar amount [source: Lee].

2. Home Office Deduction

The home office deduction is a little controversial. Not because anyone doubts that it's amazing: No one can argue that writing off a part of your home's Internet bill or heating feels like you're getting away with a tax crime. But there's a persistent rumor that deducting a home office is akin to writing "Audit, Please" on top of your return — and then adding neon yellow highlighter to the heading for good measure.

Here's the thing: If you do qualify for the home office deduction, take it. It's unlikely that it leaves you any more vulnerable to an audit, and loads of people don't write off home office spaces even if they have them [source: Eisenberg]. But do know that the requirements are strict, and you certainly aren't doing yourself any auditing favors if you make false claims.

The key is that you must use the office space for regular and exclusive business use. (That means no trying to write off the family den, where the kids play computer games and you occasionally check your work email.) However, there are lots of intriguing exceptions for things like storing inventory or

meeting clients, so check out the rules and see if you might find one more deduction for your small business.

1. Be Vigilant About Employees and Vendors

The IRS defines “vendor” pretty broadly; it’s basically any person you pay for rent, services or even prizes and awards. The list also includes materials and equipment, so long as you paid an individual or partnership. Here’s something the IRS is super strict about: If you’re paying these vendors over \$600 throughout the course of the year, you’re going to have to send in a 1099 form. It might be prudent to collect a W-9 from all the vendors you work with — regardless of how much you’re anticipating paying them — just so you have their mailing information and tax IDs [source: Kohler]. You’re subject to penalties if you don’t send the 1099 — and you can be dinged even if you’re a little late.

It’s also important that you don’t attempt to classify employees as independent contractors. Trying to avoid payroll taxes or withholding is not going to endear you in the eyes of the IRS. Check out the IRS for some simple ways to determine if you need to start identifying your workforce as employees [source: IRS].

Author’s Note: 10 Tax Tips for Small Businesses

Perhaps we made the home office deduction sound a bit daunting, but do know that even the IRS is trying to make it easier for folks to claim. Instead of making you figure out a percentage of your expenses to deduct based on the space you use in your home, the IRS now offers the “simplified” home office deduction: Simply multiply the square footage of your office (up to 350 feet [107 meters]) by \$5, and then deduct that dollar amount.

SAFETY



Respiratory Protection in the Age of Coronavirus We have the technology to keep hazardous contaminants out of the air we breathe

BY TOM O'BRIEN

When 2020 began, the sight of folks wearing face masks who weren't performing manual labor, treating patients, or robbing banks was inconceivable. As this dreadful year draws to a close, face coverings are ubiquitous but NIOSH-approved respirators are more elusive than an ivory billed woodpecker. COVID-19 is a hard reminder that good health cannot be taken for granted.

We've learned some valuable lessons this year: Jobsite hygiene is no laughing matter; airborne contaminants can be breathed out as well as in; an effective respiratory protection plan cannot solely depend on a filter over the face; and, perhaps most important, for people with compromised respiratory systems, some viruses can be lethal.

"This is the year of the lung, so to speak," says Michelle Kelley, spokesperson for Oneida Air Systems, a manufacturer of dust control systems for jobsites and woodworking shops. "Hopefully, people will be more aware of how much damage breathing in airborne hazards such as silica, and even sawdust, can do over the long haul."

CLEAR THE AIR

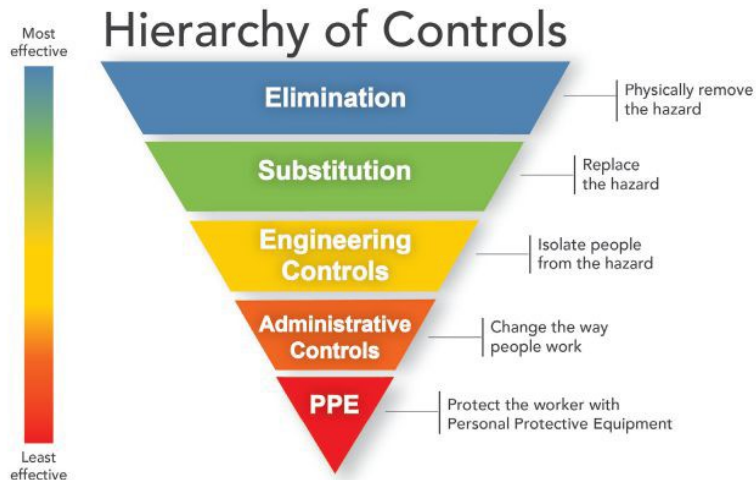
According to the American Industrial Hygiene Association (AIHA), 15.2% of construction workers over the age of 50 suffer from some form of lung disease, a rate that's almost twice as high as that for white-collar workers. Another disturbing statistic comes from

Photos by Tom O'Brien

JLCONLINE.COM

JLC / NOVEMBER/DECEMBER 2020 **39**

RESPIRATORY PROTECTION IN THE AGE OF CORONAVIRUS



Much like the Food Guide Pyramid that it resembles, NIOSH's Hierarchy of Hazard Controls ranks health and safety controls in order of decreasing effectiveness. Like red meat, PPE should be used sparingly and in small portions.

CDC-NIOSH health communication specialist Nura Sadeghpour: "53,000 workers die annually from occupational diseases, almost 10 times the number who are killed by traumatic injuries."

Airborne respiratory hazards are categorized as dusts, mists, fumes, gases, or vapors. The first three are particles—dusts are solid particles, mists and fumes are the liquid variety. All of these can be captured with particulate filters (HEPA being the most efficient option). Gases or vapors in the air require filtering elements tailored specifically to the nature of the contaminant. But no law says that those filters have to go on the face.

This year, every human being knows what it's like to wear a face mask, if not a respirator, for an extended period of time: It's uncomfortable, inefficient, and potentially harmful, especially when you're doing strenuous labor in a dusty environment.

When employers make plans to address airborne health hazards, the U.S. Occupational Safety and Health Administration (OSHA) leaves no doubt in its Air Contaminants Standard [1910.1000(e)] that the respirator shall not be the first choice:

"To achieve compliance ... administrative or engineering controls must first be determined and implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or any other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this section."

HIERARCHY OF CONTROLS

The National Institute for Occupational Safety and Health (NIOSH)—as well as AIHA, OSHA, and every other lettered organization that promotes health and safety—urges employers to

design their protection protocols using a rubric that ranks five categories of hazard control from most effective at risk reduction to least (see "The Hierarchy of Hazard Controls," left).

Here are some examples of jobsite procedures that fit the categories in this hierarchy:

Elimination: Encapsulate asbestos or leaded paint instead of removing it.

Substitution: Remove paint using non-toxic liquid stripper.

Engineering Controls:

- Use wet saws and drills when cutting masonry products.
- Use shrouded power tools connected to HEPA vacs to capture dust at the source.
- Use air scrubbers to capture whatever gets away, and provide good separation between the work area and occupied areas of the building to ensure air between them does not mix.

Administrative Controls:

- Keep the jobsite clean.
- Set up the cutting station outside.
- Train all employees on proper procedures for dust control practices.
- Inspect and maintain equipment to prevent malfunctions that might allow contaminants to escape.
- Coordinate with subcontractors to minimize demolition and do all of it at the same time.
- Schedule hazardous work practices for times when no other workers are present.

Personal Protection Equipment: Use respirators (specifically "filtering facepiece respirators," as we shall describe in detail below).

Generally speaking, PPE is the least effective means of providing health and safety protections, because it does not eliminate the hazard and leaves the wearer exposed to it if the equipment is damaged or poorly maintained.

That's not to say that all forms of PPE should be done away with. "Eye and hand protection can never be minimized," says Ken Tucker, director of the Connecticut Department of Labor Division of Occupational Safety and Health (CONN-OSHA), "but we try to avoid the need for respirators as much as possible."

Rob Robillard, owner of A Concord Carpenter, follows an all-of-the-above approach to keeping the air clean. "We're using air scrubbers when it makes sense, we're using ZipWalls when it makes sense, we're collecting dust at the source, and we're vacuuming with HEPA vacs, sometimes multiple times a day, to keep the dust down."



Manufacturers have a burgeoning array of attachments that enable workers to work safely at almost every dirty job (even paint-scraping). Shown above (clockwise, from upper left): Festool Drilling Dust Nozzle D 27-BSD, Oneida Air Systems Viper Vacuum Scraper, Oneida Air Systems Dust-Free Router Hood, Bosch HDC200 Universal Dust Collection Attachment.

LEAD PAINT AND SILICA RULES PAVE THE WAY

Not long ago, dust extraction was a two-person job: One would operate the saw, drill, or whatever, and the other would hold a vacuum hose close enough to the cutter to suck up the dust. By the mid-1990s, innovations such as tool-operated vacs and dust shrouds were catching on. But it took the government to goose the market.

Demand for dust controls got a kick in the pants in 2008 when EPA's Renovation, Repair and Painting (RRP) regulations went into effect, and a shot in the arm in 2017 when OSHA instituted the Respirable Crystalline Silica Standard (1926.1153). Although plenty of contractors grumbled about the onerousness of these rules, the swelling demand for dust-control solutions spurred toolmakers to flood the market with innovative methods to capture dust at the source and filter the breathable air. Highlights include:

- Almost all power tools are factory-equipped for dust collection.
- Third-party manufacturers such as Oneida Air Systems (oneida-air.com) and Dustless Tools (dustlesstools.com) have come out with dust-capturing hand tools, as well as shrouds that enable older power tools to work dust-free.
- Reasonably priced tool-operated HEPA vacs are commonplace (some feature Bluetooth capability for pairing with cordless tools).
- Cyclonic dust collectors (staples in woodworking shops) have arrived on the jobsite, both in the form of standalone units, and as pre-sorters for HEPA vacs—to separate out the larger dust particles so they don't clog the filter.
- Air scrubbers (aka "negative air machines") have gotten more portable and more affordable.

TABLE 1 FROM THE OSHA SILICA STANDARD

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 hours /shift	> 4 hours /shift
Hand-held power saws (any blade diameter)	Use saw equipped with integrated water-delivery system that continuously feeds water to the blade.		
	Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.		
	When used outdoors:	None	APF 10
	When used indoors or in an enclosed area:	APF 10	APF 10

In this example, if a worker uses a saw outdoors for four hours or less per day, no respirator would be needed. If a worker uses a saw for more than four hours per day or any time indoors, he or she would need to use a respirator with an assigned protection factor (APF) of at least 10. A NIOSH-certified filtering facepiece respirator would provide this.

PERMISSIBLE EXPOSURE LIMITS

The aim of engineering controls such as these is to keep airborne contaminants out of a worker's "breathing zone" (within 10 inches of a worker's face). Unless the concentration of respirable hazards exceeds the Permissible Exposure Limit (PEL), respiratory protection is not required. PEL is expressed in terms of micrograms (µg) of airborne contaminant per cubic meter (m³) of breathable air over the duration of an eight-hour workday. Prior to 2017, the PEL for quartz, cristobalite, or tridymite (the three most common forms of crystalline silica) was 250 µg/m³. OSHA's silica rule slashed it to 50 µg/m³.

In years past, employers were on their own when they used the Hierarchy of Controls to design safety protocols that protected workers without forcing them to suit up like HazMat teams; they had to come up with their own dust-containment plan and be prepared to provide evidence—such as air-sampling testing data—to prove its effectiveness. That's not the case with the silica rule.

"It's a massive step forward. One of the best things that OSHA could have done to help the employer comply with a mandate," says Ken Tucker of CONN-OSHA. What he's specifically referring to is

RESPIRATORY PROTECTION IN THE AGE OF CORONAVIRUS



Cyclonic dust extractors can suck up large volumes of dust without clogging filters. Large stationary units are common in woodworking shops, but there are several portable types available now, as well. At left is an “add-on” version, which requires you to use your own vacuum; at right is an all-in-one unit.

Table 1, a chart that zeros in on 18 common work practices that involve silica and specifies procedures to be followed and what (if any) PPE is required for the task (see sample, previous page; for the complete Table 1, search online for “OSHA Table 1 silica”). Employers who adhere to the general mandates of the silica rule and follow the methods prescribed in Table 1 have no further obligation to prove the effectiveness of their silica safety plans. “If you follow the script, use the wet methods, use the dust collection systems, or whatever it may be, there’s no need for air monitoring,” says Tucker.

OSHA IS NOT YOUR FRENEMY

Although the silica standard applies to only one type of hazardous dust, the practices and controls specified in Table 1 attest to the effectiveness of capturing dust at the source. For proof, look at the number of situations where respiratory protection is not mandated. For instance, if a contracting firm upgraded its arsenal of dust collection devices and reconfigured its safety protocols to align with the Hierarchy of Controls, how would it determine under what situations respiratory PPE might still be needed?

The quantitative solution is to hire an industrial hygienist, or other specialist, to test the concentration of hazardous particles in a worker’s breathing zone as they’re performing potentially haz-

ardous tasks. Air monitoring of this type is relatively easy to do in a shop or a factory, but significantly more complicated when the environment changes from job to job.

For budget reasons, home builders and remodelers might be better advised to seek a qualitative solution to the question. If they can get over their (understandable) hesitation to invite an OSHA representative onto their jobsite, help is just a phone call away.

The On-Site Consultation Program ([osha.gov/consultation](https://www.osha.gov/consultation)) is designed to provide advice, consulting services, and training (all free of charge) to small businesses that do hazardous work. Although it’s federally funded, this program is administered at the state level. Consultants who visit jobsites are not empowered to issue citations or report safety violations.

“We don’t share any information with the Feds,” says Ken Tucker, who oversees Connecticut’s On-Site Consultation Program. “We go out at an employer’s request, and limit our investigation to what’s asked of us. After evaluating the work practices and exposures, we write up a report that goes to the employer and no one else. It’s 100% anonymous.”

Air sampling is among the free services offered by the consultation program, but Tucker has rarely seen the need for it on residential construction sites. “Monitoring may be done, but we try to look



“Air scrubbers” are designed to sit in the middle of a work area and pull air through a cyclonic extractor (as in the Vortex Duct One unit, at left) or through HEPA filters (as in the Pullman-Ermator A1000, above). When the exhaust is ducted outdoors, an air scrubber can create negative pressure in the work area that can help keep contaminants out of other areas in a building.

at what we can do to use engineering controls and administrative controls to reduce exposures,” he says.

RESPIRATORS 101

A well-thought-out safety protocol should reduce the need for wearable respiratory protection to a handful of dirty jobs—demolition, insulation, paint preparation, and spray painting, for example—wherein airborne contaminants are not easily contained. When respiratory protection is mandatory, it’s because the concentration of airborne contaminants swirling around a worker’s face constitutes a serious health threat. Choosing proper protective devices cannot be taken lightly.

There is no such thing as a dust mask. Every NIOSH-approved wearable device that filters the air is a respirator, whether it’s disposable or reusable. The technical term for a disposable one is “filtering facepiece respirator” (FFR); that means that the entire mask, apart from the straps, is a filter, and, just like a cartridge filter, when it has outlived its usefulness, it must be discarded.

Reusable respirators fall into two categories: air purifying and air supplying. Air-purifying reusable respirators function the same as FFRs, except that they rely on replaceable cartridges for filtration; they’re also more versatile because they can be fitted with

a variety of filter cartridges to protect the wearer from different categories of airborne contaminants. Air-supplying respirators rely on fresh air being pumped into the mask, like a scuba diving set-up. These devices are expensive and are rarely seen in residential construction.

In order to choose the proper air-purifying respirator for a particular job, you may need three pieces of information:

1. Assigned protection factor (APF).
2. Nomenclature (for FFRs).
3. Nature of airborne contaminant.

APF refers to the level of protection. An APF of 10 means that the respirator (if properly fitted) can safely be worn in an environment where the airborne contamination is as much as 10 times the PEL. NIOSH-approved FFRs and reusable half-mask respirators both have an APF of 10. A full-face reusable respirator (the kind that looks like a gas mask) can achieve an APF of 50. Although APFs range as high as 10,000, anything over 50 requires battery power or supplied air.

FFRs are only suitable to filter particles (dusts, mists, or fumes). They are classified by a letter, which refers to oil-resistance, followed by a number, which designates filtration capability. The N95 that we hear so much about these days is not oil-proof, and is designed to filter 95% of airborne particulates. An R95 is oil-resistant; a P95 is oil-proof. An N, R, or P100 can filter 99.7% of particulates and qualifies as HEPA.

Contaminants other than particulates require a reusable respirator with replaceable cartridge filters, which are color-coded by the hazard they protect against (see table on next page, bottom left).

RESPIRATORY PROTECTION IN THE AGE OF CORONAVIRUS



A NIOSH-approved disposable filtering facepiece respirator (FFR), such as an N95 (above left) or N100 (above right) can be used for protecting workers from particulates, but not vapors and gases. These models have double head straps, which provide a better seal than the ear loops found on KN95s.



A reusable half-mask respirator (above) with the right color-coded filter (below) can protect workers from particles as well as hazardous vapors or gases.

Filter Color	Hazard
Magenta	Particulates (HEPA)
Black	Organic vapor
White	Acid gas
Green	Ammonia and methylamine
Yellow	Organic vapor and acid gas

FITTING

Everyone who needs a respirator on the job must be cleared by a doctor and fit-tested annually to ensure that the mask seals tightly to the face. FFRs are one-size-fits-all, but reusables are manufactured in small, medium, and large. Beards are not permissible unless the facial hair is entirely within the seal. For more information about an employer's responsibilities under OSHA's Respiratory Protection Standard, search online for "OSHA 29 CFR 1910.134."

MAINTENANCE

As they fill up with debris, particulate filters become more effective, but less comfortable; a good rule of thumb is to replace a particulate filter when you notice an increase in breathing difficulty. Gas and vapor filters are more problematic, because they soak up contaminants like a sponge but lose their effectiveness when saturated. The only way that workers can become aware that one of these filters needs to be changed is if they smell the contaminant, but by that time they've already been exposed. To make sure that never happens, contractors can set up a cartridge change schedule, based on the nature of the contaminant, airborne concentration, and duration of exposure. Fortunately, there's an app for that: Visit the NIOSH website ([cdc.gov/niosh](https://www.cdc.gov/niosh)), and enter "multivapor" in the search box.

After you have worn a respirator for hours in a sweaty, dusty environment, you will have created a Petri dish. To prevent lung infections or facial dermatitis, a reusable respirator must be cleaned at the end of every workday. Best practice is to take it apart and thoroughly scrub it with soap and water. Second best is to use wet wipes that are specifically designed to clean respirators without damaging the silicon.

COVID-19 CONCERNS

Almost a full year has elapsed since bells first rang out in warning about a previously unknown, highly contagious respiratory virus, yet severe shortages of vital PPE such as NIOSH-approved N95s persist to this day. One bright spot (perhaps) is that countries that have successfully contained the pandemic are shipping their surplus FFRs to us. Shelves in supply houses that once held N95s are now filling up with KN95s. What's the difference? Besides cost (demand has driven up costs of FFRs), the short answer is that a KN95 respirator is the Chinese equivalent of an N95. The filtering element is equally effective, but one area of concern is that most KN95s have ear loops, rather than adjustable head straps, which make achieving a tight fit to the face more difficult. For more information about which makes of imported PPE might be safe to use, visit the NIOSH website ([cdc.gov/niosh](https://www.cdc.gov/niosh)).

Until medical professionals and first responders are stocked up, builders would do well to focus their safety plan on the Hierarchy of Controls and lessen their reliance on PPE. With proper planning and diligence, it's conceivable that the only place a construction worker might be required to strap on a face mask is at the grocery store.

Tom O'Brien is a freelance writer and carpenter in New Milford, Conn.

After a home inspector identified foundation issues in their crawlspace, an inspection client hired a foundation repair company to fix the defects. After the modifications, the client asked the home inspector to return to confirm that the foundation repair company had adequately addressed the issue. Upon re-inspection, the home inspector told his client that the repairs “looked good.” The client took that to mean that the issue was resolved.

Little did the inspector and the client know, the foundation repair company had not done a good job. Their repair work was poor and, not long after the re-inspection, the foundation issues returned. The client sued the home inspector for signing off on the repairs, resulting in a claim that cost around \$100,000.

What is a re-inspection?



A re-inspection is a visual examination of a property you have previously inspected for the same clients. There are two types of re-inspections:

1. Inspections for the same client after a repair or other modification.
2. Inspections for the same client of an area that was inaccessible during the original inspections.

Both forms of re-inspections have potential liability pitfalls.

But what about the same property, different clients?

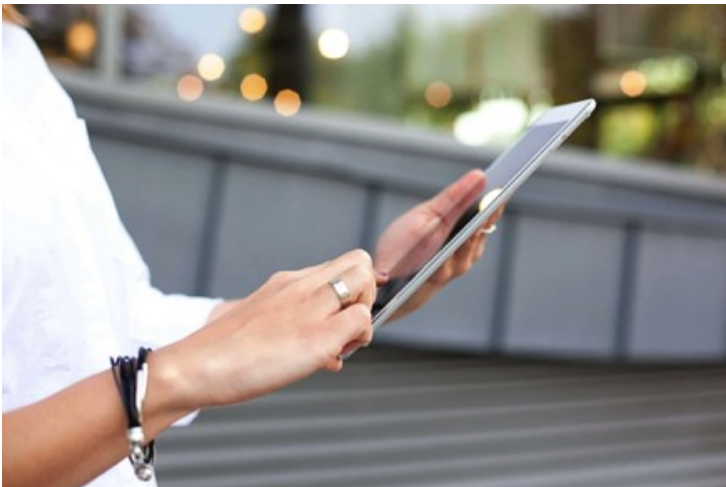
But before we launch in, we need to discuss another type of inspection some inspectors miscategorize as a re-inspection: Inspections of the same property for a different client, usually a new buyer after the previous one fell through. Even though you’ve examined the property before, inspections for new clients are new inspections. As such, you need to obtain a new pre-inspection agreement and generate a new report.

Contracts are between the two signing parties. If you don't have an agreement with your new clients, you have no inspection terms, meaning you're open to a plethora of liability. Furthermore, if you lack a signed pre-inspection agreement, you violate the terms of your insurance policy and, therefore, will not be eligible for coverage should a claim arise.

Similarly, your inspection report belongs to your original client. And, reports for past inspections should be considered no longer accurate—regardless of how much time has passed between your original and subsequent inspections. A home inspection is a snapshot in time. The defects you find during your inspection are the ones that were present at the time of the inspection. Even variations in the weather on inspection day can alter findings. While you will do your best to visually identify concerns and recommend actions, your inspection cannot predict future issues in the house. Thus, we advise against relying upon or even referencing old inspection reports.

Now, we return to re-inspections of the same property for the same clients. In this article, we go over frequently asked questions regarding these inspections and how to manage risk during a re-inspection.

When do I need to obtain a new agreement?



When a re-inspection is an extension of the original inspection you performed, your original pre-inspection agreement applies. That's assuming that your re-inspection is to examine a component or a system that you either a) didn't inspect originally or b) deemed deficient or needing further evaluation.

The exception to the rule: If there's a significant time difference between the original inspection and the re-inspection—like six months—we suggest you get a new signed agreement. This is because most claims and legal professionals will treat it as a new inspection.

How thorough should my re-inspection be?

If you are performing a re-inspection for the same client after repairs or modifications, limit your re-inspection to those specific items.

Todd Newman from AmeriSpec of Louisville in Kentucky suggests thoroughly communicating with your client to make sure they understand the parameters of your re-inspection.

“We establish it very clearly so that both parties know what we’re going there to re-inspect,” Newman said. “We’re there for that particular task. We don’t deviate. If we’re there to test some outlets or plumbing, that’s all we are there for.”

Sticking to inspecting the repairs or modifications is an important part of managing your risk. We’ve seen situations in which inspectors deviated from the initial purpose of the re-inspection. Maybe they noticed something they didn’t before. Or perhaps they second-guessed their previous observation. Whatever the reason, analyzing additional areas of the home during a re-inspection poses a significant claims risk. Oftentimes, the inspection contingency window has already closed, so clients are more likely to be upset rather than grateful if you point out another problem—particularly if that problem’s a big one.

What comments can I make regarding repairs and modifications?



When performing a re-inspection of a property after a modification, never make workmanship determinations. Just because you can’t see a previously visible deficiency, it does not mean that it was repaired properly. The seller may have attempted to fix the issue themselves. And even if a licensed contractor made the repair, they may have done so insufficiently.

“After work has been done, things could have been [negatively] affected by the contractors. Or, [other defects may have been] hidden from the contractors’ view,” said Richard Stockton of A Better Home Inspection Service, LLC in Virginia.

Do not change your original report. Rather, give your clients an addendum or supplemental re-inspection report. When providing a supplemental report, avoid definitive statements. Do not attest that an item appears “fixed,” “repaired,” or “functional.” Rather, simply state that you can no longer identify the deficiency you discovered during your original inspection, or that there are no visible reportable defects present. Also, be sure to include lots of pictures illustrating how the area appeared upon re-inspection.

Not surprisingly, clients and real estate agents tend to dislike this cautious approach. They may pressure you to confirm that the modifications look okay. However, don’t be tempted to oversell. Many claims involve allegations in which inspectors told clients that a repair looked “fine” when,

really, the modification was far from it. So, stick to what you can see and avoid reporting what you can't.

Are there any reasons not to perform a re-inspection?



Both types of property re-inspections are eligible for insurance coverage under most policies. Re-inspections of previously inaccessible systems and components can benefit both the client and the inspector. However, re-inspections of repaired or modified items, we recommend performing with extreme caution or forgoing entirely.

Whoever performed the repair or modification should be responsible if it fails. However, if you approve the work, the client may blame you for future problems associated with that modification. So be sure to avoid the perception of approving repairs as much as possible. (That goes for original inspections, too.)

Additionally, you may want to consider what additional risks may be associated with re-inspections in your state. Recently, a court in Colorado ruled that one of our insured inspectors fell within the definition of a “construction professional,” making him subject to the Construction Defect Action Reform Act (CDARA). The CDARA can invalidate any limitation of liability provision in an inspector’s agreement if a claim arises because of a re-inspection of repairs—as it did in this inspector’s claim. While this inspector’s case doesn’t set binding precedent for home inspectors in the future, it’s worth noting the potential for a similar outcome.

Carry home inspection insurance

Whether you’re performing a re-inspection or an original inspection, it’s important to protect your business from potential claims with errors and omissions (E&O) and general liability (GL) insurance. Apply today to receive a no-obligation quote.

ROOFING



A Versatile Fluid-Applied Roofing Solution Acrylabs is a paint-like coating that can solve tricky flashing details

BY KYLE DIAMOND

Photos by New Dimension Construction and Tim Healey

Most of the time, we sub out the roof work on our projects, but not always. Occasionally—because of scheduling issues or some unique aspect of the job—we tackle the roofing ourselves. That was the case for a renovation project we recently completed, which included two 15-square, low-slope roofs with planned solar arrays. Because of the numerous roof-to-deck anchors needed to support the PV panel stanchions, we decided to install Acrylabs, a seamless, fluid-applied acrylic elastomeric roof system, rather than an EPDM or other single-ply membrane.

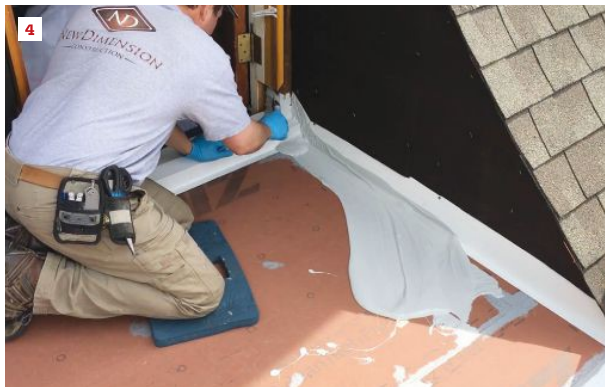
Acrylabs is a versatile product that we've successfully used over the past 15 years or so on all types of jobs, from large roofs like the one in the photo above to small deck-over-living-space projects. To fix

leaks, we've also applied it as a re-roof material over a number of different types of roofing. The system is easy to install, doesn't require respirators or other special equipment, and doesn't require a big investment in tools: basically, just a roller, paintbrushes, and a good pair of scissors to cut the reinforcing fabric that gets embedded in the elastomeric coating. Some contractors spray-apply the material for a smoother appearance, but we haven't invested in that equipment.

Our cost for materials is about \$2.50 to \$3 per square foot with shipping; for estimates, pricing with materials can range anywhere from \$5 to \$15 per square foot, depending on the size of the roof and whether it's a new roof or a roof-over.

In this article, I'll lay out how we install the system, with a focus

A VERSATILE FLUID-APPLIED ROOFING SOLUTION



Instead of sealing the sheathing joints on this small upper-story deck with Zip tape, which would telegraph through the Acrylabs coating, workers troweled on a smooth layer of Sikaflex sealant (1). Before applying the Acrylabs tack coat, the reinforcing fabric was carefully cut to fit (2), then rolled up for later application. The coating can be applied by brush (3, 4) or “squeegee-style” with a 1/2-inch nap slit foam roller (5).

on three different types of projects: a small rooftop deck with some tricky flashing details; the large roof referred to above, with the solar array; and an aging flat-seam metal roof with a built-in gutter.

WATERPROOF DECK OVER LIVING SPACE

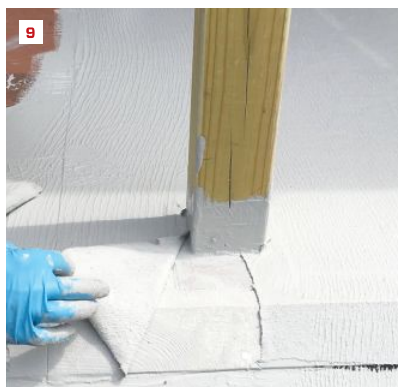
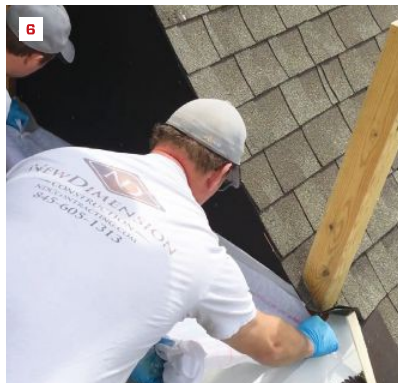
A few years ago, we remediated a walkout deck that served as a fire egress for a third-floor apartment. Because of some faulty flashing details, water had been leaking into the apartment and the living space below, both through the door opening and around the perimeter of the small roof deck, following severe weather events. Wind was driving rain up behind the siding and into the wall and floor framing, so we needed to repair the deck and reflash the deck-to-wall joint to stop the leaks. The project also included a new railing system with new posts.

We started by removing the old railing, siding, and roof deck down to the framing. Then we installed new 4x4 pressure treated posts and 5/8-inch Zip System floor sheathing. Normally, we would

apply Zip tape to weatherproof the joints in the sheathing, but we’ve found that taped joints telegraph through the Acrylabs coating, which also sometimes causes the tape adhesive to bubble. Instead, we troweled Sikaflex sealant into the joints and nail holes, taking care to smooth out the sealant.

Next, we cut and folded custom aluminum flashing to fit around the deck perimeter, up into the door opening, and out over the edge of the deck. It’s a kind of belt-and-suspenders approach, with the flashing providing a smooth and durable substrate for the Acrylabs waterproofing layer that will cover it.

Reinforcing fabric. Mesh 2000 stitchbonded reinforcing fabric comes in various widths up to 40 inches. We use narrow widths to flash joints and seams, and wider widths to cover larger areas. On a small roof like this with a lot of corners and edges, we use full-width fabric but cut the corners to fit prior to applying the elastomeric coating. It’s not critical that the corners are perfectly cut to form “pig ear”-type folded inside corners, because the fabric only



The fabric is embedded in the tack coat smooth side up; workers used the red line woven into the fabric to note where the upturned leg of the fabric at the wall should be (6). After the fabric has been carefully worked into the tack coat to smooth it out and remove air bubbles (7), the saturation coat is roller-applied (8). Workers cut the field fabric around the posts (which had already been flashed with copper) (9), then wrapped the upturned legs of the fabric with another narrower strip of fabric, which was pre-cut at 3 1/2-inch intervals so that the legs would extend out over the field fabric (10). Additional base coat material was then brushed over the post flashing (11). Later, excess Acrylabs can be sanded smooth prior to painting.

reinforces the coating; instead, the goal is to make sure each corner is smooth and fully reinforced with embedded fabric.

The fabric has a smooth side and a fuzzy side; we orient the fabric with the smooth side up, and so that it will lap up over the aluminum corner flashing by at least 2 inches. At the door, we left plenty of material to completely cover the threshold. At the edge of the deck where the aluminum flashing extends out over the asphalt shingles, we let the fabric run long and slipped some felt paper under the flashing to protect the shingles from the coating.

Base coat. The only difference between the Acrylabs 2100B base coat and 2100 finish coat is that the finish coating contains a mildewcide (both have UV inhibitors); you can use finish coat as the base material, but you can't use base material as the finish coat. The base material is applied in two coats, for total coverage of about 2 1/2 gallons per 100 square feet.

We start by pouring some material onto the roof, then use a 4-inch brush to spread a fairly thick tack coat around the perimeter over the flashing, into corners, and around posts. To apply the material to bigger areas, we switch to a 9-inch roller fitted with a Foam Pro slit foam roller cover, which leaves just enough coating thickness without creating puddles of material that take much longer to dry.

Because embedding fabric with pre-cut corners in the tack coat can be a little tricky, we stopped applying base coat at the edge of the deck when the layer was about 16 inches wide. Then we carefully rolled out the fabric, using our hands to push the cuts and folds into the edges and corners. It's a good idea to wear latex gloves to protect your hands while doing this, but when we don't expect quite as much close contact with the coating, we simply use lots of suntan lotion on our hands, which makes cleanup afterwards much easier.

After embedding the edges, we rolled the remaining fabric back

A VERSATILE FLUID-APPLIED ROOFING SOLUTION



To dry-in the large solar roof project, workers applied base coat and fabric to the Zip System sheathing seams (12). Zip tape was used to seal a roof-to-wall intersection (13). After spreading out the tack coat with a roller (14), workers bedded fabric in the coating (15), then applied the saturation coat (16), taking care to smooth out wrinkles in the fabric (17) as they squeegeed the coating to the desired 25-mil thickness.

and finished applying the tack coat. Then we finished embedding the first fabric layer into the tack coat, making sure that there was plenty of coating material between each fabric layer at the folds. Sometimes leaves or insects land in the coating, so we take care to remove those as we go; any bump or wrinkle in the fabric and initial coating layer will show up in the finished surface.

Next, we apply the saturation coating. This has to be done while the tack coat is still wet, so on a big job it's important to have enough workers to maintain a wet edge during the process. At the corners and edges where there are small flaps of fabric, working with a very wet brush will help to avoid pulling the fabric away from the tack coat. We use both the brush and our hands to press the fabric into the corners to ensure there are no voids or air bubbles. Then, we roll out the rest of the saturation coating so that the total thickness of the base coat is consistent—about 25 mils—and smooth, keeping in mind that the surface appearance of the coating after this step will be reflected in the appearance of the final finish. On subsequent courses, we overlap the fabric by 3 inches.

Posts and other roof penetrations. When we installed the PT

railing posts, we flashed them with reglet cut copper, which was covered by the base coat and reinforcing fabric. We also lapped the base coat up a few inches on all four sides of each post, and then embedded a piece of fabric that wrapped all the way around the post and was pre-cut at 3 1/2-inch intervals so that it extended an inch or so out over the roof deck. Each layer of fabric was embedded in the coating material.

Finish coats. Depending on the temperature, humidity, and sun exposure, it can take up to eight hours or more before the base coat is dry enough to apply the first finish coat. We apply two finish coats, with the drying time between these coats typically much shorter, usually one to two hours. Each coat uses about 1 1/4 gallons per 100 square feet. After we're done, the total dry film thickness of the system should be about 45 mils.

One strong selling point of this system is the large number of colors—at least 24—that the material is available in. The finish coats can be roughed up with sand broadcast by hand between coats to give the surface more traction. In addition, for frequently used rooftop decks that see a lot of foot traffic, a high-strength (2100 HT) finish coating material is available.



Installing the fabric in weatherboard fashion is not critical. On this large roof, workers started the base-coat application in the center and worked toward the eaves in sections (18), allowing each section to dry before applying the adjacent one and lapping the fabric by 3 inches. Solar mounts and other roof penetrations are easily flashed and integrated into the Acrylabs base coat with additional fabric and coating material prior to application of the two colored finish coats (19). Where drip edge was required, workers plowed a shallow 3-inch-wide dado in the sheathing with a power planer to avoid creating a “speed bump” of material that could cause ponding along the edge of the low-slope roof; shown here are the eaves of one of the home’s small mansard roofs (20). New copper counterflashing was let in to an existing brick chimney, which was then flashed with Acrylabs (21).

BIG LOW-SLOPE SOLAR ROOF

Technically a hip roof, the 30-square roof (an upper and lower roof, each measuring about 15 squares) that we recently completed for a renovation project demonstrates how versatile the Acrylabs system is. As on the smaller roof deck, we used 5/8-inch Zip System panels to sheathe the roof, but instead of using tape or sealant on the joints, we used narrow strips of Acrylabs reinforcing fabric embedded in base-coat material. That way, we were able to quickly dry in the roof while we waited on delivery of the solar panels and their supporting hardware. We also had to wait for a stretch of good weather.

Weather window. One of the main limitations of the Acrylabs system is that installation requires dry, seasonable weather both prior to installation and afterwards. It can’t be installed over a wet surface, so even morning dew is problematic. And if it rains while the coating is wet, the coating will wash away, though the product becomes “rain ready” after a few hours, with the outer layer skinning up. If it’s hot and sunny, the coating may dry too quickly, while it dries extremely slowly in cool, humid conditions. We won’t install it when temperatures dip below 40°F or when a freeze is expected

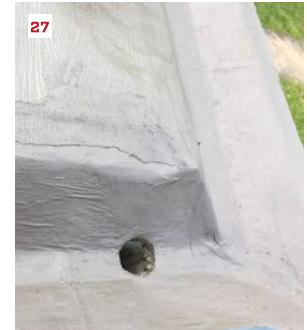
within 24 hours. Wind, too, can be a problem, as it can blow leaves and other debris into the wet surface.

While a small roof can be installed by one or two workers, a large roof requires a crew of four or five, especially on a warm, sunny day, when the material dries quickly. To spread the coats rapidly, we use double-headed roller cages that accept two 9-inch-wide roller covers, and fit them with long, heavy-duty extensions. To make sure that the tack and saturation coats don’t dry prematurely while we embed the fabric, we set up our workers so that each is performing a dedicated function, like taking care of the coating bucket, rolling out the fabric, or using a roller to spread the material.

Solar mounts. After allowing the base coat to cure, we worked with the solar sub to lay out the locations for the 160 EcoFasten Solar SimpleGrip-SQ mounts. After the sub mounted the base plates to the roof deck, we flashed the compression plates that fit over them to the base coat with additional 12-inch squares of fabric, each with a hole cut out of the middle, and additional coating material.

Drip edge. On low-slope roofs, we’ve found that water tends to pond along the edge of the roof where the Acrylabs coating laps over

A VERSATILE FLUID-APPLIED ROOFING SOLUTION



To repair an existing flat-seam metal roof with a built-in gutter (22), workers first power-washed the roof and scraped it clean. Starting with the L-flashing at the wall (23), workers applied the base coat (leftover colored finish coat from another project) reinforced with fabric. The fabric reinforcement was used with the base coat over the entire roof, including the built-in gutters (24). Here, a worker is applying the first of two silver-colored finish coats (25). After completing the finish coats (26), workers cut out the hole for the gutter's downspout, flashing the cut edge with additional fabric and coating material to avoid delamination of the membrane (27).

the drip edge. To provide a smooth transition from the roof membrane over the drip edge that allows water to drain off the roofing material unimpeded, we use a power planer to rout a 3-inch-wide by 1/8-inch-deep dado along the edge of the sheathing to receive the drip edge.

Finally, once we finished flashing the roof vents, skylights, and other roof penetrations with Acrylabs, we came back and applied two finish coats.

ACRYLABS OVER AN EXISTING ROOF

We've recoated a number of different types of roofing materials with Acrylabs, including both flat- and standing-seam metal roofs, BUR asphalt roofs, and EPDM. Recently, for example, we used Acrylabs to fix a troublesome flat-seam terne metal roof with built-in gutters. While the material tenaciously adheres to almost anything (I still have some on a belt that I wore for a project seven years ago), thorough prep work of the existing roofing is the key to success.

On a metal roof, the process starts with pressure-washing the roofing, followed by scraping to remove patches and other repairs. The idea is to make the final project visually pleasing, keeping in

mind that surface irregularities will telegraph through the Acrylabs.

Once the existing roofing was prepped, we applied the base coat, following the same protocol as on other projects (tack coat, reinforcing fabric, and saturation coat). On sloped standing-seam roofs, it isn't necessary to use the reinforcing fabric when applying the base coat. In this case, the base coat is finish coat left over from another project, which explains the dark bronze color in the photos above.

This roof had an integrated gutter, which is one of the reasons why Acrylabs was such a good choice for the repair. The material conforms to complex shapes and is self-flashing, so we simply coated over the downspout opening for the gutter when we applied the base coat and cut it out later after the base coat had dried. Then, to cover the cut edges that could lead to delamination of the roof over time, we flashed around the drain opening with additional reinforcing fabric and coating. Finally, we applied two colored finish coats to complete the repair.

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

BY JIM BRADLEY AND CHRIS WEST

Tracing Air Leaks With a Blower Door



To begin a “smoke check,” the authors fill a home with dense fog produced by a high-volume theatrical fog machine (1).



With the blower-door fan blowing inwards, co-author Chris West starts to pressurize the home, pushing the fog to the exterior (2).

Part and parcel of being home-performance consultants based in northern Vermont is promoting the importance of a pre-drywall inspection for new homes. For us, the inspection includes establishing a home’s ACH rating (air changes per hour) as well as visually examining the primary air barrier for air leaks while the interior shell is still open. Although we still use an infrared camera to help locate air leaks, we find fogging homes or “smoke checking” to be the most effective method.

To perform smoke checks, we use a theatrical fog machine (1). We first fog a home’s interior, then set up a Minneapolis Blower Door to pressurize the home and push the fog to the exterior through any open seams or gaps (2). This pressure test helps locate what we refer to as “areas of opportunity”—a last chance to easily tighten up the home’s air barrier prior to drywalling and installing the exterior cladding. Putting the effort in to track these down can often add up to hundreds of cfm worth of leakage reduction.

In addition to reducing a home’s energy performance, air leaks can be a health and safety issue. Small rodents can easily squeeze through small gaps in an air barrier and decimate a home’s insulation package, causing IAQ problems, or gnaw on Romex wiring, causing a potential fire hazard—a common occurrence in the rural North Country where we work.

Immediate feedback. A key advantage fogging offers is that it immediately demonstrates to the builder, his or her crew, and the homeowner problem spots in need of remediation. Also, air exfiltration at large unsealed gaps in the air barrier can be visually compelling, with fog jetting out of the building envelope like a vape pen.

Using an IR camera to find air leaks is effective, but when the temperature differential is low between the home’s interior and outdoors, the smoke test offers better results. We often use the two in tandem, fogging a home to get a quick overall sense of where leaks are, and then fine-tuning the search with an IR camera.

Tightening up your game. We recommend familiarizing yourself with your state’s status regarding impending IECC rules and preparing accordingly. In Vermont, where we work, the new 2020 Residential Building Energy Standards (RBES) was implemented on September 1, 2020. As a result, blower door testing by a certified tester is now required for the RBES Base and Stretch codes. All newly-built

Photos by Sebastian West and Tim Healey

Energy / Tracing Air Leaks With a Blower Door



With the building pressurized, fog could be seen escaping from two doghouse dormers at their roof-to-wall junctures (3).



Co-author Jim Bradley points to smoke leaking from double-hung windows in living space above the garage (4). After checking the window openings and dormer framing, workers determined that the window units themselves were leaking (5).

homes are now required to be blower-door-tested for air leakage to certify a maximum airflow of 3 ACH50—it's no longer just a visual inspection. "Self-certifying" is allowed, but in Vermont, all testers must be certified through the Building Performance Institute (BPI) or Efficiency Vermont. Although Vermont is one of only 10 states that is currently implementing the IECC rules as is, other states will soon follow. It's important to stay informed on energy codes where you work, as energy standards tend to become more stringent over time, not less.

For us, the newly-enacted VT RBES mandate means the need for pre-drywall blower door testing—combined with a smoke check—will be all the more crucial, particularly on new homes built to code where air-sealing may be part of a builder's job scope but may not be applied to the nth degree. We expect to see more demand in the near future for pre-drywall testing on newly built code-compliant homes, in an effort to achieve better certified ACH numbers.

SMOKE CHECKING A HOME

Even well-sealed homes may be in need of tightening up. Earlier this year, we did a pre-drywall inspection and smoke check for an architect known for his high standards regarding energy efficiency. We discovered numerous problems with the air-sealing and insulation detailing that would have made his high-performance house project much leakier than it should have been, given the time and energy devoted to designing and building it. As a result of our findings, the builder was able to mitigate the leaks prior to drywalling, saving the energy-conscious architect the headaches he would have had if the mistakes had been covered up and the building had then underperformed.

Also, it's not out of the realm of possibility that building crews and subtrades who have bought into the concept of building well-sealed, high-performance homes but are rushing to meet a scheduling deadline can accidentally miss air-sealing penetrations or seams. Sometimes, crews have a bad day or "night before" and do not do the greatest air-sealing job on a particular day—these things happen.

Air-sealing is not always the problem. On another pre-drywall inspection we did last June, we were asked by a local home-building company to perform a blower door test and smoke check on a new custom house. At first glance, we could see that the builder's crew did a top-notch job air-sealing the interior side of the framing and the usual hard-to-seal spots.

Starting out, we set up the blower-door assembly with the fan oriented to blow inwards. We then filled the entire home with "smoke" using a high-volume theatrical fog machine (chauvetdj.com). The machine burns a special fluid to create the fog, which is innocuous but has a faint odor. It took about 20 minutes to fill the entire 4,500-square-foot

home. We then pressurized the house with the blower door to push the fog out through the home's primary air barrier and inspected the home's exterior perimeter for air leakage.

We could see smoke coming out a pair of second-floor doghouse dormers along the rake edges of their roofs (3). Dormers are somewhat notorious; because they are framed above the roofline, they are difficult to air-seal and small air leaks are common. More noticeable was the smoke emanating from the double-hung windows located at the second-floor living space above the garage (double-hungs are known to be less airtight than casements or European tilt-and-turns). The three windows were identical, but one of them was leaking more than the other two (4). The builder's crew broke out their ladders and determined the smoke was leaking from around the window's frame and not from its taped-off flanges (5). The window manufacturer was notified about the leaky unit.

Blower door test. With the smoke check completed, we can turn the fan around and depressurize the house to find our baseline ACH rating numbers for the client, which turned out to be 1 ACH50, well under the code maximum airflow of 3 ACH50, negating the need for another test (6).

As an aside, we now use a TEC DG-1000 Pressure and Flow Gauge manufactured by The Energy Conservatory to calculate a home's ACH rate. We've found its new DG-1000 manometer much more intuitive than its old workhorse DG 700 model (7). A high-resolution touchscreen graphically shows you such items as what size rings you need on the blower door fan, and what pressure taps to hook the red and green diagnostic tubing to, depending on the airflow-measuring task (8). TEC also has an app available that enables you to sync your smartphone to the manometer, which allows you to operate the DG-1000 remotely—it's a big step up from the older model.

We've heard many builders say, "We foamed everything," and think that's it with respect to air-sealing, but it's not. There are usually air-sealing opportunities waiting to be fixed. That's why a pre-drywall inspection is so valuable. It's a great fail-safe that will show air leakage pathways that need to be considered, such as penetrations for dryer and whole-house vacuum-cleaner vents, security lights, and range hoods. Other hidden trouble spots include changes in house geometry, such as shed and doghouse dormers, and built-up framing, such as inside and outside corners, ganged jack studs and king studs, headers, and double top plates.

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With the smoke test completed, the authors depressurized the home and performed a blower door test (6).



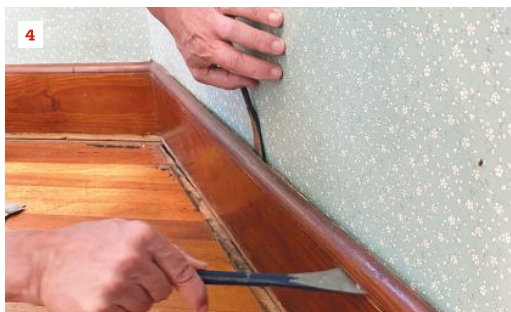
The authors used a new TEC DG-1000 manometer—here compared with an older DG 700 manometer—for the blower door test (7). The DG 1000 is much more intuitive, graphically showing where to connect red and green diagnostic tubing (8).

Training the Trades

BY CLAYTON DEKORNE



Either side of the mitered quarter-round cap can be removed first, but the overlapping baseboard on the right dictates starting on that side (1).



Wide-chisel pry bars have a thin, sharp blade that does minimal damage to soft woods. Use two in tandem, overlapping as you work along the entire length of the board (2-4).

Photos by Elenai Studios

Surgical Demolition

When we think of what finish carpenters do, we think mostly of what it takes to create beautiful woodwork. But carpenters working on existing homes spend a lot of time taking things apart. If we intend to restore the woodwork—often a desirable option in an old house full of exquisite old-growth woods and deep, well-proportioned profiles—we need to surgically remove the pieces, inflicting as little damage as possible so they can be reassembled and refinished.

That was the case in the 1867 house photographed here. In a room built over a low crawlspace, the task was to take up a beautiful vertical-grain fir floor and cut out sections of subfloor so the crawlspace walls could be insulated with spray foam. The operation depended on removing the baseboard and flooring without damage; the photos show some of the key tools and techniques needed to pull off that trick.

Here are some principles to keep in mind:

Reverse order. A big part of removing woodwork is knowing how it was assembled in the first place. You need to remove it in the reverse order it was installed. Look at joints first. Miters can usually be taken apart from either side. Look at both ends of each piece of trim before you act. The ends of baseboard usually butt each other in the corners, and you have to take off the overlapping piece first. The last few boards of strip flooring usually are face-nailed, and you need to identify and disable those nails to begin disassembly. It's a lot easier to determine the installation order of clear-finished woodwork than it is with painted woodwork. (See the online version of this article at jlconline.com for more on removing painted woodwork.)

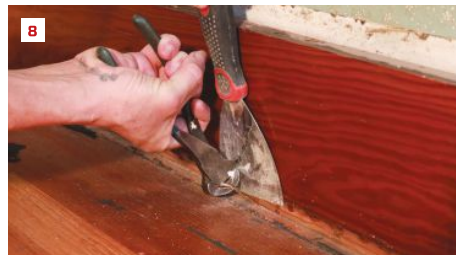
Loosen up everything along the entire length before you start pulling a piece off. Disable finish nails by driving them clear through the wood with a pin punch. You may not get them all, but the more nails you disable, the less hold the board will have. Use a utility knife to slice through paint or varnish along seams to break the bond of the finish. Work with two pry bars in tandem. (I like the wide-blade Japanese pry bars by Yamaguchi, Dogyu, or Shark Grip.) Pry against walls at studs to avoid punching through wall surfaces. Avoid prying against finished boards, and when you can't avoid that, use a wide, flat trowel under the fulcrum point of your pry bar to protect the finish surface. As the board becomes looser, it will be easier to identify fasteners that are still holding a piece in place.

Vacuum at every step. A good industrial vac is an indispensable demolition tool. I vacuum after each piece of wood is removed to make it easier to see my next step and to protect the woodwork. Paint and varnish chips, and especially drywall and plaster dust, are abrasive. In the end, you want clean, unmarred woodwork.

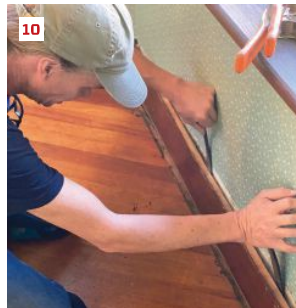
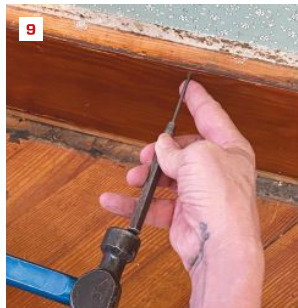
Training the Trades / Surgical Demolition



End-cutting nippers (5) are a primary tool in a restoration carpenter's tool bags. Yes, they are great for snipping wires, but their main use is pulling finish nails from the *back* of trim. The back surface will get dented (6), but only a small hole will be visible on the face.



If you do need to pull a nail from the face, use a wide, flat trowel to protect finish surfaces (7). (Note: The trowel will get dented and won't be of use for taping drywall.) It helped to pry these long 10d finish nails from both sides (8).



Drive finish nails all the way through with a pin punch.

With most nails driven through, work a pair of flat bars in tandem (10) to loosen the board before trying to pry it off (11).

Installers face-nailed the last floor boards. Start here (12).



A flat bar can be used "backwards" to push open a joint (13). Push straight back; don't rotate the bar, or you may dent the edges. Split the tongue off the last full-width floor board with a chisel to allow the board closest to the wall to come loose (14).

With the tongue removed, work in tandem with two bars to pry up the first board (15). Once the two courses of face-nailed boards are removed, the blind nails in the flooring can be sliced off at floor level with a multitool (16).

Comics

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Ted Glover

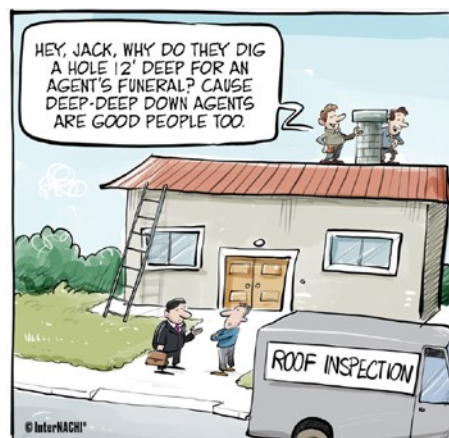


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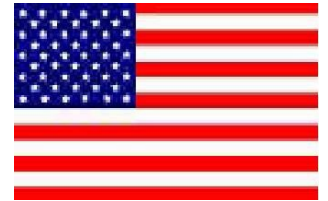


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