News of Interest for and from the Connecticut Association of Home Inspectors, Inc.

CAHI MONTHLY NEWS

September 2018 Volume 11, Issue 9

Presidents Corner

Our association is at a transition point. We are financially healthy. We have steady membership levels. We also have stable systems in place to provide the quality education that you have come to expect. What we don't have is the next generation of leaders for our organization.
I am asking for you to consider stepping forward and offering a small amount of your time to serve as a C.A.H.I. director. Please talk to a current director and ask about how you can help and what your commitment would require.

At our recent meeting we confirmed that we currently have two openings on our board of directors and expect as many as two more openings in the upcoming licensing period.

The need for new board members became even clearer at our recent elections. We adjourned the meeting without electing a President, Treasurer or Secretary. Our re-elected Vice President, Woody Dawson will act as President for the near future. Rob Gutman will continue to act as Treasurer however he declined to run for re-election.

I also declined re-election. I will remain on the board and will provide my services as the interim Secretary. I am very proud to have been able to serve as your President. It was a tough decision but one that is best for me and my family. As President we were able to incorporate many improvements in Credit Card processing and Web hosting while offering a couple of full day CE events along with 35 hours of CE credits in the past year..

Unfortunately I have left some unfinished work. We are working towards adjusting all membership renewals to a July date in order to allow a concentrated membership drive with postcard and email reminders.
I hope you all support the Board through this time of change.

Thank You

Bill Kievit

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 free to members. 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

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Meeting Dates!

September 26th Meeting

Cheshire Ct Fire Marshal

John Andrews

The Fire Marshal's Office is responsible for all fire code enforcement, building plan review, fire and life safety inspections, fire prevention, and public fire safety education.

BY JLC STAFF

Installing Fiberglass Batts

No other building material has changed more in the past few decades than insulation. From fibers made from stone and recycled slag to spray foam insulation, new materials (each with its own pros and cons) seem to arrive almost daily. But despite all the changes and advances, fiberglass-batt insulation is still one of the most common types of insulation being used today. Readily available and easy to install, fiberglass can provide effective insulation in walls and ceilings if installed correctly.

General guidelines. Before discussing installation, we need to understand some broad concepts about fiberglass insulation. First, it comes in either rolls or batts. With rolls, each individual length has to be cut. Batts (which we will be talking about here) are available in precut lengths that commonly fit stud bays for 8- and 9-foot walls.

Fiberglass insulation also comes in precut widths to fit typical stud wall spacing—either 16 or 24 inches on-center—and in thicknesses that fit typical wall framing, such as 3 1/2 inches thick for 2x4 walls and 5 1/2 inches for 2x6 walls.

The most important thing to realize about installing fiberglass-batt insulation is that its effectiveness depends on six-surface contact: top and bottom plates, studs on both sides, wall sheathing to the outside, and wallboard to the inside. The insulation should fit snugly in the stud bay without being compressed; compressing the batts reduces the insulation's overall R-value. Also, do not leave any empty air spaces in the stud cavity—voids around insulation allow air to move, which again undermines the R-value of the insulation.

Fiberglass batts are available faced or unfaced. The facing on the batts acts as a vapor barrier. There is some disagreement as to whether to staple the facing to the edges of the studs or along the sides of the studs. Face stapling does not compress the batt along the edges, allowing the insulation to loft fully into the entire space

Photos by Roe Osborn

To insulate effectively, fiberglass batts need to fill the entire stud bay without being compressed. To insulate a wall, start by filling the full-width bays. Insert the batt from the top down, pushing it up against the wall plates. If the sides snag on rough lumber, run a putty knife along the side of the stud.

To cut a batt to width, hold it up to the bay and pinch the top at the width needed. Holding the batt against a double stud, cut down from the pinched point as far as possible **(2)**, and then flip the batt to cut the rest **(3)**. Cut the batts to length along the bottom plate **(4)** and tuck into place **(5)**. For stud bays below windows, cut the batts to length all at the same time **(6)**.

between studs. Side stapling creates small pockets of air and compresses the edges of the batts, both of which can reduce the effectiveness of the insulation. However, if the drywall installer intends to glue the sheets to the studs, side stapling will leave the edge of the stud exposed for the adhesive.

Protecting yourself. Exposing bare skin to fiberglass can cause itching and irritation. When working with fiberglass insulation, protect your hands with disposable gloves. A long-sleeve shirt and long pants or a disposable paper suit can help protect arms and legs.

Fiberglass insulation also tends to produce fine dust that can be very irritating to the lungs and breathing passages, so always wear a good dust mask (3M 8210, N95 or equivalent) when working with fiberglass insulation. That dust can irritate eyes as well, so safety goggles are advisable.

Cutting and installing batts. When insulating a room, first fill the full-width, completely open stud bays (with no plumbing, electrical, or HVAC in the way). Working from the top of the stud bay down, gently insert the batt into the bay with the top edge snug against the top plate **(1)**. Then work your way down the bay, pressing the batt into place. If the sides of the studs are rough, they may snag the insulation as it slides into the stud bay, preventing it from expanding to fill the cavity. Run a putty knife along the edge of the stud to release any places where the insulation might be hung up.

Depending on the brand, precut batt lengths will be slightly long for the stud bay, but at this point, just let the excess stick out at the bottom of each bay. It's usually much easier to cut them off all at once rather than getting up and down for each batt.

Next, fill the full-height empty bays that are narrower than a full width. Hold a batt up against one side of the narrow bay and pinch the top of the batt at the desired width. While still pinching the width, hold the batt up against a double stud (such as the side of a window opening). Fiberglass batts cut easily with a sharp blade in a utility knife, so starting at the pinched point, cut down the length of the batt, keeping the cut as close to parallel with the edge as possible **(2)**. When you've cut as far down as you comfortably can, stop, flip the batt lengthwise, and finish the cut from the other end **(3)**. Now the narrow batt can slip into its bay.

To fit insulation around simple wires traveling across a bay, pinch the batt at the height of the wire **(7)**, and then slit the batt partway at that point **(8)**. For complex wire runs, separate the thickness of the batt **(9)** and then feed the outside layer behind the wires **(10)**. After pressing the inside layer into place, cut around the switch box for a snug fit **(11)**.

When you've completed a large wall section, go back and trim the bottoms of the batts. Simply cut the excess off each batt using the edge of the bottom plate as a cutting guide **(4)**. After cutting a batt to length, push the bottom edge into the bay to allow it to loft or expand properly in the space **(5)**. Keep track of all the cut-off scraps. They come in handy for small or odd-shaped wall cavities that need to be filled with partial pieces.

Finally, cut the pieces that fill in the bays under window openings. Hold a batt up to one of the bays, and this time, pinch the side of the batt at the proper height. Count the number of short pieces you'll need and cut them all at once **(6)**.

Insulating around wires and pipes in walls. Now we can turn our attention to the stud bays that have electrical or plumbing in them. Where wires run horizontally across the bay, there are two strategies. With the first approach, begin by holding the batt against the bay and pinching the location of the wires **(7)**. Then cut partway through the batt at that height **(8)**. The slit then wraps around the wires as the batt is pressed into the bay.

This method is fine if the wire is pretty close to horizontal and if there are no switches or feeds that have vertical runs. Otherwise, it makes more sense to split the thickness of the batt up as far as the wire **(9)**. Because of the way fiberglass insulation is manufactured, you can separate the batt naturally without cutting the fibers. Then when the two sides are pressed back together, their fibers marry naturally to create a complete and effective blanket.

After splitting the batt, feed the outside section behind the wires and switches, sliding it up to the wall plate **(10)**. Then push the inside part of the batt into the bay. If there is a switch box, run the utility knife around the box, cutting out just the inside layer of insulation. Make the cutout slightly smaller than the box so the insulation fits tightly around it **(11)**. When the cutting is done, go around the bay and make sure that both layers are in full contact with the top, bottom, and sides of the bay, and that the fibers of the two layers have joined back together.

For a more detailed discussion, go to **jlconline.com/training-the-trades/installing-fiberglass-batts**.

Photo 10 by Arn McIntyre; all others by Steve Easley

Practical Air-Sealing

Getting to 3 ACH50 isn't hard if you focus on these locations

BY STEVE EASLEY

In my work as a building-science consultant, I meet with builders around the country. Many of these are production builders, and I often work with their crews to teach them about quality assurance—issues that can lead to either inspection red tags or costly callbacks. In the past few years, as more states and municipalities have adopted the 2012 and 2015 International Energy Conservation Code (IECC) into local building codes, I have spent an increasing amount of time educating crews about cost-effective approaches to air-sealing. The new energy code mandates blower-door verification for homes, with a maximum 3 ACH50 in climate zones 3 to 8. That's a tough mark for some builders to get to from the previous requirement of 7 ACH. The new requirement means that builders now have to be very deliberate in their air-sealing efforts.

With diligent effort, we can do a lot better than 3 ACH50. A good example is Jake Bruton's work featured in "Air-Sealing That Works" (Apr/18). But in this article, I'm not going to look at how close to the cutting edge of airtightness we can bring conventional practice. Rather, I'm going to target some of the low-hanging fruit, so to speak—the places a building crew can focus on to hit the 3 ACH50 that's required by code. That low bar begins with a discussion of what doesn't work.

Fiberglass insulation (by far the most commonly used insulation in U.S. homes) does not stop air leakage. Two of the photos above show this clearly: The black areas are caused by dust and dirt getting pulled through the insulation. Insulation works as a filter but not as an air barrier. I'm constantly surprised how builders loosely think that if we are dealing with insulation, we must be dealing with the energy code. Maybe the limitation here is a lack of understanding that there's much more to the energy code than just saving money on air-conditioning bills.

Many of the builders I work with initially see air-sealing only as an energy issue. A few also appreciate the comfort and indoor-health issues. But one of the most important, and often underappreciated, reasons for air-sealing is durability: By controlling air leakage, we help control moisture.

The photo above of fungus growing on the sheathing and wall

framing is of an exterior wall; it's inside a wall cavity where a plumbing stack is running. Leaks at the plumbing stack and the sheathing allowed moisture laden air from the interior to leak into the stud bay. The moisture condensed as the air made its way out through sheathing joints, leading to water soaking the wood and providing the right conditions for mold and rot. The lesson here is that air-sealing is about so much more than just about reducing energy bills.

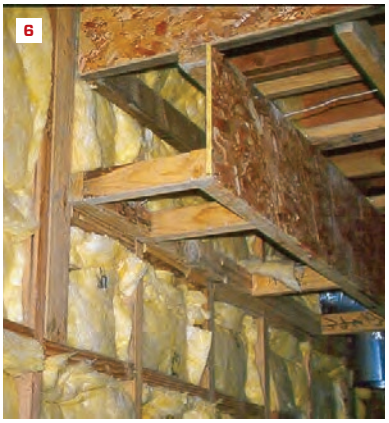
WHY ACCURATE MEASUREMENTS?

Air-sealing, or rather providing a "continuous air barrier," has been a code requirement for a long time. The big change with the 2012 version, in addition to lowering the maximum air leakage rate, was the new requirement to verify the air leakage rate for a home using a blower door. While the testing requirement is new to many builders, it may be a blessing in disguise. If you don't measure, you don't know how leaky or tight your building is. Many of the air leaks in a building cannot be visually identified. With a blower-door test, you have an accurate approximation of the total air leakage in the building.

Researcher David Wolf, working with Owens-Corning in 2013, performed a study that dove deeply into quantifying home air leaks. Using typical blower-door depressurization conditions, Wolf designed a battery of tests to measure, and rank, the impact of air leaks in different locations of a home to determine which air leaks make the biggest difference in the total air leakage (see "An Air-Sealing Priority List," Aug/13).

Wolf's work has been especially useful in quantifying all those seemingly small, inconsequential leaks to show how big an impact these can have on total house air leakage. His work mirrors my field experience and is a good guide for builders and their crews on where to focus their air-sealing efforts. But there are other factors besides just the amount of leakage. How much effort is involved plays a big role, and that effort often varies by how a builder works, how many trades are involved, and how the scheduling of different trades unfolds during a project.

Recessed lights are a common source of air leakage, as clearly shown by the light shining around this conventional can light viewed from the attic **(1)**. This fixture **(2)** reportedly meets the code requirement for "airtight, IC rated," but in fact you can see light through one gasket. **Duct boots** are best sealed with foam sealant **(3)**.



Huge hidden leaks above this garage ceiling **(4)** will be inaccessible once the ceiling is hung. These areas should have been sheathed before the shed trusses were installed. Similarly, attic trusses used for this bonus room create enormous leaks **(5)**. **Cabinet soffits** are huge leaks to the attic **(6)**. Drywall on the lid is the best way to shut these down **(7)**.

ATTIC FIRST

For an air leak to occur you have to have a hole and a pressure difference. Pressure differences are caused by wind, stack pressure and mechanical equipment. Fewer holes mean less leakage. Attics are particularly prone to losses from stack effect, which effectively turns a house into a drafting chimney (hence "chimney effect" is a synonym for "stack effect"). Air leaks at the top tend to be the most numerous and the easiest to remedy, making the attic the single most important place to focus on.

I recently air-sealed a house built in 1978. Because the house had a family of bats in the attic, all the attic insulation had to be removed. This was a perfect opportunity to air-seal. By sealing only the attic leaks, we cut the air leakage rate from 4,460 cfm to 2,180 cfm—more than half the total air leakage. If builders would conscientiously air-seal the attic ceiling after the drywall is hung—before insulation—getting to 3 ACH50 would be much easier. It wouldn't have to interrupt the sequence of the job, and it could be done with minimal cost. More production builders need to take this step.

Can lights. Of all the openings in a house, one of the biggest from an air-leakage perspective is around recessed light fixtures. In Wolf's study, can lights accounted for an average of 9.1 CFM50, or about 0.15 to 0.31 ACH50, per fixture. One way to think about this amount of air leakage is that for every four to five can lights you seal, you can gain about 1 ACH50.

Conventional recessed cans are extremely leaky. You can see right through them **(1)**. Surprisingly, many so-called "airtight, IC-rated" fixtures (which is what the energy code requires) are not much better **(2)**.

Better from an air-sealing perspective (and arguably from a lighting perspective, as well) are a range of new LED "can-less" fixtures that either have a low-profile housing or are surface mounted. Both types have simple plug-and-play-type wire connections that not only simplify the installation but result in almost no penetrations. With LEDs, you also don't have to worry about any thermal overload so you can spray foam or otherwise bury them in insulation without fire concerns.

Duct boots at the end of HVAC supply runs through the attic are another big ceiling penetration from an air-sealing perspective **(3)**. Wolf measured the average leakage at 7.7 CFM50, or 0.13 to 0.26 ACH50, per boot. Foam sealant carefully applied to the perimeter of the boot and the drywall tends to be the easiest way to seal these leaks.

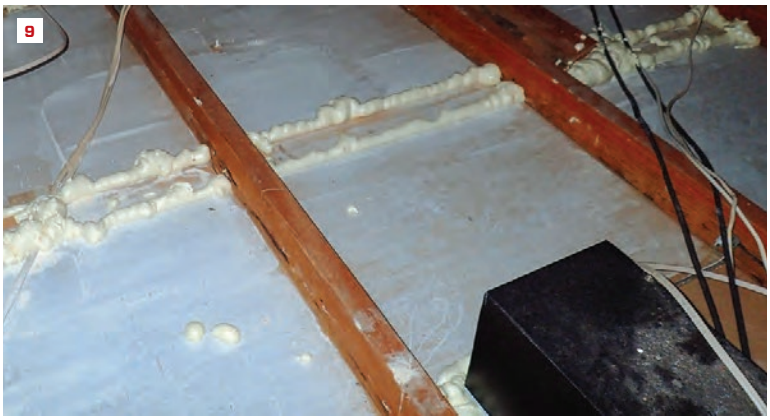
Knee-wall areas and the floor and roof sections outside attic trusses are protected from weather, but otherwise "open" to outside **(4)**. The best way to deal with these enormous leaks is with rigid foam or heavy cardboard sheathing. It is picky work to piece-in these sheet goods and foam or tape the edges. But if not done, the impact on performance can lead to costly warranty issues. (For more on this, see "Fixing the Bonus Room," Mar/17.)

Attics often have other huge openings that many builders don't see as air leaks. A common one occurs in the ceilings of single-story attached garages where they bump up and connect to a larger attic space over the main house **(5)**, or to a two-story wall. The best way to shut these huge leaks off is to sheathe over them at the framing stage. Otherwise, you will need to go in later and cut pieces of rigid foam to block off the areas between the truss chords, and then seal the edges with foam sealant.

Dropped ceilings above cabinets are often left open to the attic floor **(6)**. The exterior wall gets insulated, and often the insulation contractor will lay a batt over the opening in the attic floor, but underneath that insulation is just one big hole to the unconditioned attic, which is effectively outside.

The most effective way to seal these is by installing the ceiling drywall before framing out the soffits. A continuous drywall lid over the area effectively shuts down the airflow, whereas the drywall that gets pieced on the sides and bottom of the soffits doesn't. There are too many cracks at the soffit corners that corner bead and drywall mud don't seal.

Not every builder can get the drywall contractor on board to hang the whole ceiling early in the schedule, but you may be able to get the pick-up framing crew to install a few selective sheets of drywall over the soffit area **(7)**. It's not much drywall compared with the entire ceiling. Having the pick-up



Top plates of partition walls in attics are huge sources of air leaks, made worse by all the electrical penetrations **(8)**. They can be sealed effectively with canned or boxed foam sealant **(9)**, but with foam sealant, installers have to be extra careful to not miss spots along each side of the plates. Having an insulation contractor hit the entire top plate with closed-cell foam **(10)** often works better.

All exterior wall plates can leak, and the garage separation wall **(11)** should be considered an exterior wall. **Band joists** are among the leakiest areas in a house. Insulation stuffed between joists is not an air-seal **(12)**. Closed-cell foam applied here provides a good air-seal **(13)**. Even if you don't insulate the walls with it (as shown here), hitting the rim-joist area only with foam can be a cost-effective way to air-seal this difficult area.

crew install these few sheets may not be as disruptive as you expect.

Wall plates in attics. Partition walls are typically framed with truss chords fastened to the top plates. Once the ceilings are hung with drywall, you generally end up with hundreds of feet of cracks on either side of the top plates open to the attic. Each stud bay in the partition effectively becomes a little chimney. Stack effect draws in air at the bottom of the wall plates and pushes it out the cracks into attics. Holes for electrical wiring and plumbing vents compound the leakage **(8)**.

While leakage around can lights and duct boots are the biggest "openings" identified in Wolf's study, drywall-to-top-plates are one the biggest "joints," accounting for around 0.5 CFM50, or 1.3 to 1.6 ACH50, *per linear foot* of joint. This can add up fast in attics.

As with soffit leaks, one way to shut down top-plate leakage on partition walls is to drywall the lid before standing partition walls. Jake Bruton employed this method on the build he covered in the April 2018 issue. It does require a full-scale sequencing change, which I have not been able to sell to many big builders, especially in this labor market. Even if you don't like this approach, its still easier to air seal the attic before insulation is installed. I can't stress enough that if builders take this step of addressing air-sealing in the attic, they will be able to achieve 3 ACH50 relatively easily.

Foam sealant sprayed along all the plate joints certainly can work **(9)**, but it's easy for installers to skip spaces along the joint, creating an incomplete air-seal. Some builderss find it's easier to send in a spray-foam-insulation installer. One reduced-cost method is to foam-over plate areas of the attic floor, including the perimeter wall plates **(10)**. Or, you can foam over the entire attic floor, though this can get expensive.

BOTTOM PLATES AND BAND JOISTS

Beyond the attic, there remains a host of wall air leaks on which builders can focus attention to produce a significant reduction in total leakage area.

One of the most significant is the bottom plate connection to the foundation,

and especially at the garage separation wall, where plate leaks measured in at 0.6 CFM50 or an average of 0.2 ACH50, per foot of joint.

At the bottom of the house, stack effect is a strong driver of air leakage, concentrating high pressure at the top and bottom of the building. This makes all sill plates prime leakage areas **(11)**.

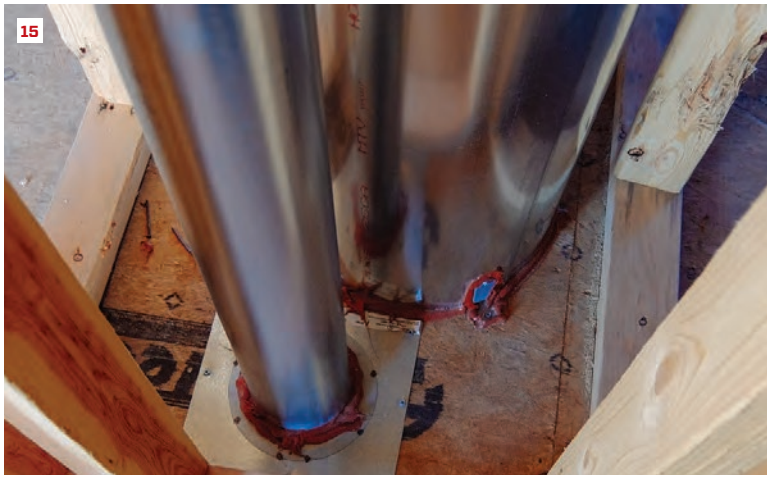
Band joists for second floors fall closer to the neutral pressure plane—the middle section of a building's height—and therefore, they do not tend to be as affected by stack pressures. Nevertheless, they are still extremely leaky owing to the number of cracks formed by all the pieces joining in this area. In fact, Wolf measured these as the leakiest joints in a house at 0.86 CFM50, or about 0.4 ACH50, per foot.

Some builders continue to believe that stuffing the rim with fiberglass is sufficient **(12)**. Batts may work to insulate this area, but you first need to air-seal with caulk in the corners at the top and the bottom of the rim joists (the corner between the sill or wall plate and the top-side decking), as well as along the joists or floor trusses crossing the sill plate. This is awkward work, to say the least. Getting between the floor joists and the decking is difficult. Some framing crews have gotten skilled at handling a caulk gun as they frame, sealing the plates before installing floor decking, and then coming back to apply one bead to seal the top of the rim to the deck. This is not the way every framing crew likes to work, however.

A much easier and still very effective way to address the rim joist is to seal the entire area with closed-cell spray foam **(13)**. It can be cost-effectively foamed to a 1-inch thickness (or in colder areas to 2 inches), and insulated with batts (flash-and-batt), or insulated to a great depth to satisfy the entire code-required wall R-value. Even if you're not insulating the wall cavities with foam, insulating the rim joist entirely with closed-cell spray foam is turning out to be a go-to solution for an increasing number of builders.

HVAC PENETRATIONS

Vents and ducts passing through framing can lead to some large, significant leaks through the building shell. (That is, leaks that impact the blower-door test—not to be



Vents for combustion appliances **(14, 15)** must not touch combustible materials; sheet metal and fire-rated caulk will work for air-sealing the gap. **Ducts** need to be sealed at the locations where they run from an attic or crawlspace into conditioned space **(16)**. But just going through the motions is not enough **(17)**; attention with spray foam is required.

Fireplace inserts are typically boxed into framed recesses that leave open framing areas connecting the conditioned space with the exterior **(18)**. A good solution is to build a sealed chamber for the insert **(19)**. The chamber will be hidden once drywall is hung on the walls.

confused with a duct-tightness test. Duct testing is a separate concern between the builder and the HVAC installers.) Many HVAC ducts and vents run through boxed-out framing chases and connect an equipment room at slab level, or a basement or crawlspace, with the attic **(16, 17)**. Once again, with many of these leaks, stack pressure is the principal driver. Plumbing vents, which run either in boxed out chases or through a stud bay, also fall into this category of leaks that connect the bottom of walls to the attic. (And we'll get to plumbing drains in a moment, which deserve their own kind of special attention at the floor level).

What makes HVAC vents, including chimney vents, special is that the air-sealing solution often includes an all-important accommodation for avoiding the risk of fire. Boxed-out vent chases should be capped with OSB or plywood **(14)**, and this combustible material needs to be cut back from the vent and the gap bridged with sheet metal and fire-rated caulk **(15)**.

Fireplaces are an important subset of this. Too often, these are installed in boxed-out framing areas. The fireplace insert itself is often housed in an area that has walls that are open to the exterior walls and a lid that opens, with a vent running out through the roof **(18)**. It's critical that builders follow the vent, which sometimes passes from the conditioned space into the attic through a very large framing opening.

The best way to handle the insert is to house it in its own chamber **(19)**, seal it off with drywall and sheathing, and use the appropriate vent, sealed with fire-rated caulk. When the walls of this home are drywalled, only the face of the fireplace will be visible (in other words, it will look like a fireplace, not a woodstove).

COMBUSTION SAFETY

Here is an important addendum related to combustion appliances and fireplaces: If you are working with a home-performance contractor for your blower-door testing, you are likely in good hands and will be guided on accommodating any natural-draft combustion appliances. For those, best practice by far is to install

direct-vent, sealed combustion appliances. However, if you're making a budget choice not to use these and you're not working with a home-performance contractor, beware: A combustion appliance that is starved for air can backdraft, drawing carbon monoxide down the chimney. This is one of those no-joke matters; it can end in the death of an occupant, and no builder wants to face that.

Until recently, energy codes have not done a good job addressing the life-safety issue of combustion-appliance backdrafting. The IECC rectifies this in the 2015 version with an entirely new section addressing fuel-burning appliances. It requires the combustion appliance, such as a furnace or a water heater, to be isolated from the building envelope by locating the equipment room either outside the envelope—in the garage or crawlspace, for example—or in a separate room supplied by open air ducts. This room must be insulated and sealed off from the rest of the conditioned space, so that like a garage or the crawlspace, it exists effectively outside the building envelope. Again, the safest, simplest and most cost-effective solution is to use sealed combustion equipment.

PLUMBING

There are two serious leaks that get missed time and time again: One is the bathtub drain over crawlspaces. It's not uncommon for plumbers to overcut the floor sheathing to make ample room to glue up the drain trap. This happens not only in wood-framed floors **(20)** but also in slabs where the slab is often formed to fit the trap and this gets left as a wide-open hole under the tub **(21)**.

The other place that gets missed is the wall behind the tub **(22)**. Unlike the wall around the tub, which is air-sealed with drywall or backerboard, the area behind the tub is often left open. The solution is simple: Before the tub surround is framed in **(23)** or the tub installed hard to the framing, the wall needs to be covered with a panel stock. This is required by code.

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Tub area. Plumbers often cut out a section of the subfloor to install traps, leaving a massive hole under the tub. Rigid foam and sealant can remedy this **(20)**. Slabs also need to be sealed **(21)**. Behind tubs, framing is often left open (**22**). This should be sealed with drywall or sheathing **(23)**.

Get Your Rental Property Ready for Winter: Fall Maintenance Checklist

By Sandra Faucett

As you start to feel the chill in the air — and suddenly you can get pumpkin spice everything — you know winter is on the way. Use this checklist to perform the needed maintenance to protect your rental properties from the cold, wet, wind and ice of the season. Completing these tasks will save you time and money from costly damage during the winter months. For more information about maintaining your rental properties, watch this webinar.

See the checklist at the end of the article.

Exterior Maintenance

Inspect roof and clean out gutters

Stop leaks at the source by checking your roof for broken shingles or holes. Replace problem areas and seal with watertight caulk. While you're up there, scoop out leaves and debris from the gutters.

Winterize exterior faucets and sprinkler systems

Insulate outdoor faucets with foam or towels held tight with a bungee cord. Drain water from irrigation or sprinkler systems and garden hoses to prevent freezing and cracking.

Check snow and ice removal tools

Make sure you have the necessary supplies to keep your properties safe, including salt for making sidewalks and paths walkable and a snowblower or shovel for clearing driveways.

Secure snow-removal services

Sometimes a shovel isn't enough: If you live in an area that generally gets a lot of snow, line up a plow service. Look for a service that lets you pay as you go in case you don't get the expected snowfall.

Landscaping

Fertilize grass and mulch beds

Mow and dethatch your lawn with a rake, aerate and fertilize. Apply fertilizer to beds as well, and then spread mulch. Water well to get the fertilizer into the soil to do its work. This is a good time to plant spring bulbs, like tulips and hyacinths, for added appeal,

Trim flowers, plants and trees

Cut back dead flowers and seed heads, and prune bushes and plants. Be on the lookout for trees that need trimming. Remove dead branches, and take out unstable trees.

Check the water drainage in your yard

Check outside areas for disconnected drain spouts and landscaping that slopes toward your foundation. Add sand or gravel to improve draining in low areas.

Interior

Check window and door seals

Check for drafts and air leaks to prevent heat escaping and cold air coming in. Caulk over trouble areas or call in a professional to replace a window or two if they are beyond repair.

Make sure the furnace is working (and replace filters)

Replace furnace filters, and check the connection between the furnace and the thermostat.

Clean out air ducts

Hire an HVAC professional to use negative pressure to clean out your ducts at least once a year.

Have your fireplace and chimney checked

If your properties have fireplaces, check for buildup and make sure the damper and flue are functioning properly. If needed, call a professional chimney sweep to come and clear soot and creosote to avoid accidental fires.

Replace batteries in smoke and carbon monoxide detectors

Make sure your smoke and carbon monoxide detectors are in tip-top shape by replacing the batteries every six months and testing them monthly.

Check your dryer to prevent fire

If you provide washers and dryers for your tenants, now's a good time to clear lint. Check the dryer's lint trap and ductwork, and clean out any built-up lint or debris.

Wrap pipes to prevent freezing

If you have pipes in chilly basements, exposed crawlspaces or accessible attics, insulate them with foam covers or towels.

Add insulation to the attic and basement

Add extra insulation to your attic ceiling and basement walls. You can use traditional insulation or spray-foam that acts as an instant barrier against freezing temperatures.

Fall/Winter Maintenance Checklist

Exterior

- ☐ Inspect roof and clean out gutters
- ☐ Winterize exterior faucets and sprinkler systems
- ☐ Check snow and ice removal tools
- ☐ Secure snow-removal services

Landscaping

- ☐ Fertilize grass and mulch beds
- ☐ Trim flowers, plants and trees
- ☐ Check the water drainage in your yard

Interior

- ☐ Check window and door seals
- ☐ Make sure the furnace is working (and replace filters)
- ☐ Clean out air ducts
- ☐ Have your fireplace and chimney checked
- ☐ Replace batteries in smoke and carbon monoxide detectors
- ☐ Check your dryer to prevent fire
- ☐ Wrap pipes to prevent freezing
- ☐ Add insulation to the attic and basement

1301 Second Avenue, Floor 31, Seattle, WA 98101

BY TED CUSHMAN

Dumping Heat to the Pool

In summer, the big power hog in most homes is probably the air conditioner. But for homes with pools, heating pool water is often a significant factor too.

This raises the obvious question: When you're using lots of power to cool the house at the same time as you're spending money to heat the pool, shouldn't there be a way to capture the heat you're taking out of the home's indoor air, and put that heat into the pool water?

Lindsay Scott, currently an energy auditor in Austin, Texas, had that same thought back when he was a builder in the Cayman Islands. Electricity is expensive in the Caymans, and Scott's customers wanted high-performance homes with low energy bills. But they also wanted swimming pools. Scott's answer was to heat the pools with waste heat from the houses, using a heat transfer system called the HotSpot FPH (for "free pool heater"), from HotSpot Energy (hotspotenergy.com).

The system is simple in concept: You just install a secondary condenser in the air-conditioner or heat-pump refrigerant line. When the air conditioner is running, if the pool needs heat,

This Cayman Islands custom home, constructed with insulating concrete forms (ICFs), used waste heat from the air conditioning to heat the pool for free (see next page).

Photos courtesy of Lindsay Scott

This custom-home swimming pool **(1)** gets its heat from waste heat recovered using a condenser spliced into the air conditioning system's refrigerant line **(2)**. The heated water is directed into the small spa pool in the center, which then overflows into the main pool. The HotSpot FPH unit **(3, 4)** is rated for 78,000 Btu and is wired to kick in and draw heat whenever the pool needs heating.

the secondary system cuts in and pulls heat from the air conditioning's coolant loop.

John Williams, the CEO of HotSpot Energy, said his product sells nicely by word of mouth. "We've never advertised," said Williams. "We're engineering types, not marketing types." But Williams was happy to explain the concept to *JLC* in a phone call. "It's basically just a conventional commercial heat-recovery system, adapted for use with a swimming pool," he said. "The only differences are some minor differences in controls, and of course we upgraded to a titanium heat exchanger to deal with salts or corrosive chemicals that could be in the pool water."

"In a regular air conditioner," said Williams, "you have a fan, and you blow outdoor air across a coil, and the heat gets thrown away into the backyard. When our system is active, the refrigerant uses the alternative water-cooled condenser, and instead of a fan, we use the existing pool pump to push water across the titanium coil, which puts the heat into the pool instead of throwing it away."

The system takes a week or 10 days to warm the pool up at the start of the cooling season (which, conveniently, is also the outdoor swimming season, Williams noted). But once the pool is warm, the HotSpot keeps it warm continuously. Said Williams, "You could never afford to keep a pool heated continuously like that with a paid-energy pool heater. Your bills would be $5,000 for the season."

And, Williams explained, the HotSpot recovers the mechanical energy of the air-conditioner compressor as well as the waste heat from the house. "It makes your air conditioner more efficient," he said, "and it heats the pool for free."

Ted Cushman is a senior editor at JLC.

CPSC has changed the format of the recalled items list. I thought it was easier to scan for items I am interested in. Thought the writeup on Rust-oleum paint was interesting.

United States
CONSUMER PRODUCT SAFETY
COMMISSION

Recall List

Below are examples of recalled items listed on the CPSC website. For a complete and updated listing go the website at https://www.cpsc.gov/Recalls.

SEPTEMBER 6, 2018

Lester Electrical Recalls Links Series Chargers Due to Fire and Burn Hazards

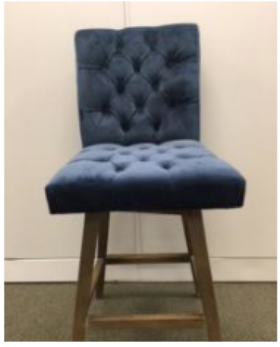
The control board can fail and overheat, posing fire and burn hazards.

Remedy:
Consumers should immediately stop using the recalled chargers and contact Lester Electrical to receive a free replacement control board or schedule a free repair.

Units:
About 19,000

Consumer Contact:
Website:
http://www.lesterelectrical.com/
E-mail:
service@lesterelectrical.com
Phone: (800) 295-2086

SEPTEMBER 6, 2018



TJX Recalls Barstools Due to Fall Hazard; Sold at HomeGoods, Marshalls and T.J. Maxx Stores

The wood joints on the barstool can break; posing a fall hazard.

Remedy:
Consumers should immediately stop using the recalled barstools and return them to any Home Goods, Marshalls or T.J. Maxx store for a full refund.

Units:
About 1,100 (in addition, about 500 were sold in Canada)

Consumer Contact:
Website:
http://www.homegoods.com/
Phone: (800) 888-0776

SEPTEMBER 5, 2018

Polaris Recalls Ranger Recreational Off-Highway Vehicles Due to Crash Hazard (Recall Alert)

The front lower control arms can separate, posing a crash hazard.

Remedy:
Consumer should immediately stop using the recalled ROVs and contact a Polaris dealer to schedule a free repair. Polaris is contacting all registered owners directly.

Units:
About 1,000

Consumer Contact:
Website:
http://www.polaris.com/
Phone: (800) 765-2747

SEPTEMBER 5, 2018

Hawthorne Hydroponics Recalls Humidifiers Due to Fire and Shock Hazards

The humidifiers can overheat while in use, posing fire and shock hazards.

Remedy:
Consumers should immediately stop using the recalled humidifiers and return them to the place of purchase for a full refund of the purchase price in the form of store credit.

Units:
About 400 (In addition, 70 were sold in Canada)

Consumer Contact:
Website:
http://www.sunlightsupply.com
E-mail:
RMA@sunlightsupply.com
Phone: (888) 582-2762

SEPTEMBER 5, 2018

Rust-Oleum Recalls Countertop Coating Due to Violation of Federal Lead Paint Ban

The countertop coating contains levels of lead that exceed the federal lead paint ban. Lead is toxic if ingested by young children and can cause adverse health issues.

Remedy:
Consumers should immediately stop using the recalled countertop coating and contact Rust-Oleum. Consumers who have not used the countertop coating will receive a full refund plus $25 to return the product to Rust-Oleum. Consumers who have applied the recalled countertop coating will receive a repair kit or replacement of the affected surfaces.

Units:
About 1,800

Consumer Contact:
Website:
http://www.rustoleum.com
E-mail:
rustoleumcountertoprecall@rustoleum.com
Phone: (800) 908-4050

AUGUST 30, 2018

Core Health & Fitness Recalls Stairmaster Stepmill Exercise Equipment Due to Fall Hazard (Recall Alert)

The steps can accelerate rapidly without input from the user, posing a fall hazard.

Remedy:
Consumers should immediately stop using the recalled exercise machines and contact Core Health & Fitness for a free repair. The firm is contacting all known purchasers directly.

Units:
About 3,500

Consumer Contact:
Website:
http://www.corehandf.com/
E-mail:
support@corehandf.com
Phone: (800) 598-8541

AUGUST 30, 2018

PetSmart Recalls Strip Lights for Reptile Cages Due to Fire Hazard

The strip light's fluorescent bulb can overheat causing the hood on the light fixture to ignite, posing a fire hazard.

Remedy:
Consumers should immediately stop using the recalled light fixtures and return them to any PetSmart store for a full refund.

Units:
About 23,000 (in addition, about 440 were sold in Canada)

Consumer Contact:
Website:
http://www.petsmart.com
Phone: (888) 839-9638

Photo: Tim Healey

Frost-Protected Shallow Foundations

Cold-climate alternative uses specialized insulated forms

BY ROE OSBORN

When Mitch Frankenberg decided to build five small cottages to expand his B&B in central Vermont, he looked for a strategy that would fit within his budget. Pouring five separate conventional foundations with 4-foot-deep frost walls was out of the question. Instead, he decided to put each cottage on a frost-protected shallow foundation (FPSF).

CAPTURING WARMTH FROM THE EARTH

An FPSF works by holding in the ambient warmth of the earth to prevent the soil below a shallow monolithic slab from freezing and heaving (see EPS Forms for a Shallow Foundation, page 42). The FPSF requires minimal excavation and much less concrete, resulting in savings that more than offset the additional cost of the insulation.

For these foundations, Frankenberg's contractor contacted J.E. McLaughlin, a local company, which fabricated L-shaped forms out of 6-inch EPS foam. The EPS has a 2-pound density for greater compressive strength to withstand backfilling and concrete placement.

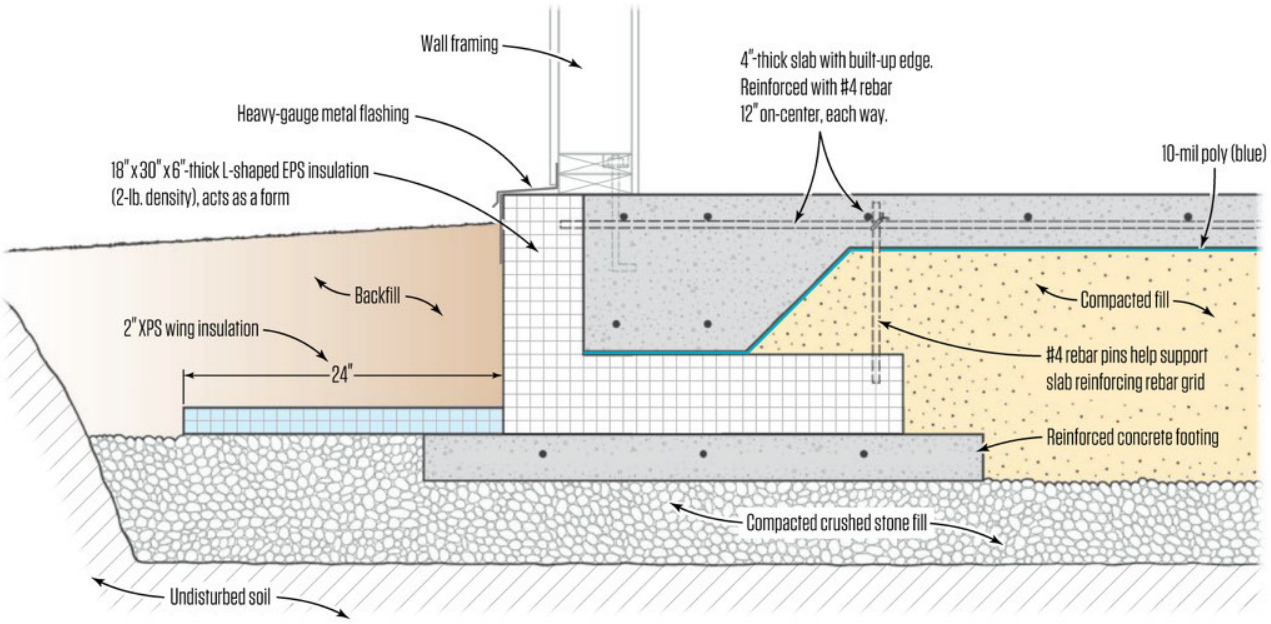
SIMPLE MATERIALS

The beauty of this FPSF is that all the materials were simple and were easy to work with. After the initial excavation, the crew formed the footings with 2x4s. The EPS forms cut easily with a handsaw and fit together like giant Legos.

The built-up edges of the slab were formed by adding and compacting soil inside the EPS forms. Extra attention was paid to constructing the rebar grid, and the pour itself was straightforward. When finished, each slab was ready for the framing crew to come in and start building the little cottages.

Roe Osborn is a senior editor at JLC.

EPS Forms for a Shallow Foundation



Capturing warmth. The insulation around a frost-protected shallow foundation captures ambient warmth of the earth to keep the soil beneath the foundation from freezing and heaving. L-shaped EPS forms create a built-up edge for the reinforced monolithic slab and hold in warmth from the ground. XPS wing insulation raises the frostline around the building's perimeter.

Excavation and footing. The first step is excavating for the foundation assembly. With the excavation open, the crew can put down a layer of crushed stone. The crew sets up 2x4 forms for the footing, using a laser to make sure that they are perfectly level **(1)**. After the crew stakes the forms in place, a concrete truck carefully fills them **(2)**.

Illustration by Tim Healey; Photos: 1, Roe Osborn; 2, Mitch Frankenberg

Insulated forms. After the footings set, the crew cuts and fits insulated forms made from EPS foam for the slab **(3)**. The forms cut easily with a handsaw, and the crew miters the corners. Next, they even out the ground inside the forms with a fresh layer of crushed stone, compacting the layers as they go **(4)**.

Photos this page by Mitch Frankenberg

Prepping for the slab. After putting down horizontal wings of insulation around the base of the forms, the excavator backfills around the forms to lock them in place. Soil added inside the forms is compacted **(5)**, and then the crew spreads a layer of poly as a vapor barrier below the concrete slab **(6)**. Vertical sections of rebar will tie into the rebar grid for the slab.

Rebar grid. A grid made from 1/2-inch rebar forms the reinforcement layer for the monolithic slab **(7)**. The ends of the bar insert into the foam, and pieces of CMU act as chairs for the grid to sit on. Each intersection is wire-tied together and anchored to the vertical rebar sections. An additional layer of rebar below the main layer reinforces the built-up edge of the slab **(8)**.

Slab placement. The concrete crew places the slab, screeding the mix flush with the top of the forms **(9)**. The treated sills for the walls attach to the slab with concrete screws for positioning **(10)**. Embedded J-bolts around the perimeter of the slab provide permanent anchoring for the framing.

Photos: 7, 8 & 10, Tim Healey; 9, Mitch Frankenberg

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