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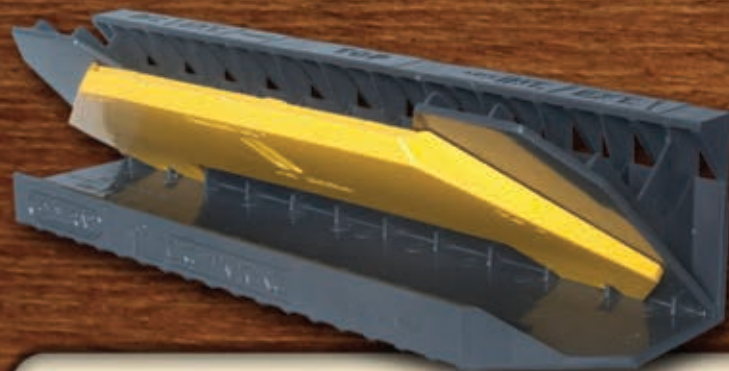
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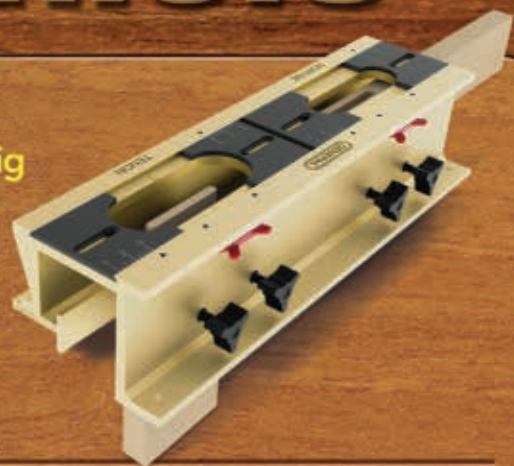
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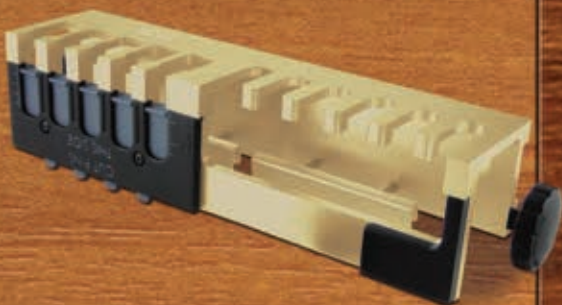
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I'm always amazed at the ingenuity of people in the building trades. It's a shame that modern society puts so much emphasis on higher education and pays so little attention to the need for skilled labor. I don't mean to suggest education isn't a good thing. I've got a degree, and it helped me get this job. But there are different types of education for different types of people, and there are many ways a person can be "smart."

For example, even with record unemployment in today's job market, there is a serious skills gap. Skilled positions are left unfilled because there aren't enough people trained to perform them. The relatively few skilled workers who fill them are enjoying a successful career. Meanwhile, college graduates are suffering record unemployment, and many of the graduates lucky enough to find work are forced to take jobs outside their field of study. Additionally, countless graduates are neck-deep in debt with student loans. So, if the goal is gainful employment and a secure career, then skilled workers appear pretty smart in today's job market.

I came across a couple more examples at this year's Remodeling Show in Chicago, Illinois. I met the makers of the SideJob Instant Cargo Rack. Invented by a construction contractor, it's a clever way to haul building materials such as lumber and sheet goods using your work vehicle, without taking up valuable interior space. Just place the SideJob Rack over your ladder rack posts, hook the cam strap to a secure location under your vehicle and tighten. You're then ready to haul materials on the side of your van or truck. The SideJob won Best New Product at the convention.

Another bright idea came from the young deck-building contractors who invented the Chadirondack (half chaise, half adirondack) from Deccessories. After fielding calls regularly from clients whose furniture blew off their dock during thunderstorms, they arrived at the Chadirondack solution. More comfortable than stretching out a towel on the deck surface, the Chadirondack allows for an adjustable seating surface that collapses beneath deck level when not in use. With a quick tug on a strap, the knee joint locks into place, requiring you only to lift the back support to complete the setup. After you've spent the afternoon relaxing in the seat, the Chadirondack easily closes and

stows nearly invisible from the deck surface, allowing people to walk on top of it.

In both cases of these new inventions, a skilled worker saw a problem and envisioned its solution. These guys then designed their products through prototypes and testing, oversaw the manufacturing and ultimately brought them to market nationwide. It takes a lot of smarts to accomplish something like that.



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**Q:** Should I turn off my attic's power fan and close the vents during winter?

**A:** Although the natural instinct to keep the house warmer may be to close the attic vents, that is definitely not a good idea. In fact a cold, drafty attic is the ideal condition for an attic during winter. Insulation is what protects the house interior from this cold attic zone. A cool attic is the best way to control moisture. The chimney effect causes heat to rise into the attic, and this warm air can hold more moisture than cold air. When that warm air cools it releases vapor as condensation, which is why you want to vent it outside. When the attic ventilation can't sufficiently dry the condensation, the house can develop mildew, wood rot, peeling paint and other problems.

**Q:** I'd like to use 6x6 lumber for the posts of a bed, but the only 6x6 material I can find at the home-improvement store is pressure-treated. Is it okay to use the treated post for an indoor application?

**A:** The simple answer is yes, many treated wood products do not emit any vapors and are safe for interior use. Check use information on specific products. However, treated wood should never be used for cutting boards, countertops or any application where it may become a component of food.



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**Q:** What's the best way to avoid stripping screw heads when driving them?

**A:** When fastening screws, poor "fitment" is when the driver bit fails to fully engage the screw with equal contact on all surfaces. This leaves gaps and results in a poor fit that leads to "cam-out" (stripping the

head of the fastener). Poor fitment can be attributed to lesser quality bits or improper engagement with the screw head. Check the bit "fitment" by pressing the bit into the screw head and measuring the side-to-side movement. The more movement, the worse the fitment. Another indicator of poor fitment is "wobble" or "slop" when in use. This off-center alignment and uneven fitment can cause those frustrating cam-outs. If your bits have this problem, then buy new bits or screws of a higher quality. It's also important for the operator to make sure the bit is fully seated in the screw head before activating the drill.

**Q:** What's an easy way to clean grease off a stove burner?

**A:** Stove burners can get pretty disgusting with grease accumulation. One easy way to clean them is to seal them up in a plastic bag with a small amount of pure ammonia. Leave them sitting overnight, and the next day you should be able to wipe the burners clean with a sponge. The ammonia fumes help to dissolve the grease (as opposed to direct contact with the liquid ammonia). **EHT**



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# Going Down the Drain

*Tips for Retrieving Items Dropped in a Sink Drain*



By Robert Robillard

working on the trap beneath the sink. I learned this the hard way one day when one of my children stepped over me and let the water run prior to getting a glass of water.

Most likely your item is still in your house plumbing and hopefully it's resting at the bottom of the sink's P-trap. The P-trap is the U-shaped pipe under the sink that holds water to stop sewer gases from coming back up through the drainage pipes. The P-trap can be found in common household fixtures such as sinks, bathtubs, showers, laundry sinks and much more. Fixtures such as bidets and toilets have a trap built into them.

The size of the pipe depends on the size of the fixture. The larger the plumbing fixture, the larger the drain pipe. Kitchen and bath sinks typically drain into 1-1/4- or 1-1/2-in. waste pipe. Two-inch pipes are common for laundry drains, and 3-in. pipes are used for most residential toilets.



*From expensive jewelry to toy army men—you name it, and it's probably fallen down a drain. First step is to remove the drain plug and try to pull the object from the top of the sink.*

**M**y brother is a plumber and has shared stories of some bizarre items he's had to retrieve from plumbing drains. From cell phones to a TV remote, toy army men to eyeglasses—you name it, and he's retrieved it from a toilet or sink.

In the kitchen, how many times have folks taken off their rings to wash dishes only to accidentally knock one of them down the drain? Sound familiar? Just ask my wife.

Whether you're trying to retrieve a small metallic item or just trying to save yourself from finally buying "that bigger diamond ring," the steps are pretty much the same.

This article will guide you

through the steps necessary to easily retrieve such items as rings, coins and more from a sink drain.

## SAFETY PRECAUTION

**A word to the wise:** Plumbing, especially in older homes, can be fragile. Improperly installed or corroded plumbing connections can break, causing thousands of dollars in water damage. Just imagine buying a new, "bigger" diamond ring in addition to a new ceiling or hardwood floor.

If you feel that your pipes may fall into this category then call a plumber for an evaluation.

It's always a good idea to shut off the water at the faucet prior to



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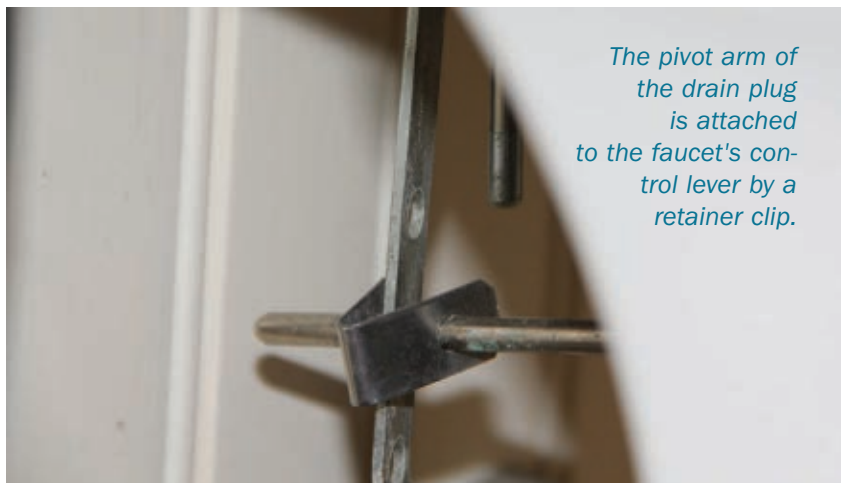


## RETRIEVING LOST ITEMS

If the dropped item was caught and is still inside the sink's P-trap, there are three possible scenarios. The best case scenario is when you can see the item and are able to use a retrieval tool to grab it out.

**Retrieval Tools—Magnetic or Prong.** A magnetic retrieval tool is a telescoping tool with a strong magnet on the end. This tool is useful for retrieving items that are magnetic. (Note: Gold and silver are not magnetic.)

A prong retrieval tool can be purchased at most home-improvement centers and plumbing supply stores. It's approximately a 3-ft. long flexible rod with a spring-loaded lever that opens and closes four prongs. The prongs are opened with a thumb push button.



This retrieval tool is very effective at grabbing items that are just out of reach.

Bathroom sinks usually contain a drain stopper mechanism, which will need to be removed if you will be using the prong retrieval tool.

Removing the stopper involves going under the sink and removing the pivot nut that holds the horizontal pivot arm onto the pop-up drain stopper assembly. Typically this nut can be unscrewed by hand.

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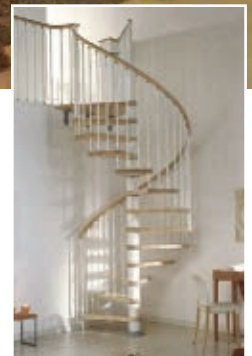
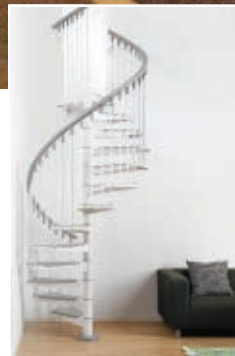


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With the drain plug in the up position, place an object such as a screwdriver under it so that it won't close.

Locate the clip that the plunger rod slips through to hold the hori-

zontal pivot arm. The pivot arm enters the drain pipe under the sink and will be found just before the P-trap.

Remove the clip by squeezing the clip together with hand pres-



*Pinch the retainer clip with your fingers to release tension and slide it off the pivot arm.*



*Unscrew the nut that holds the pivot arm so it can be removed from the sink's tail-piece. You can then lift the drain plug out of the sink.*

sure. Pay attention to how the whole unit is assembled so that you can re-install it the same way.

Next, loosen the pivot nut by hand. Remove the horizontal pivot arm and nut. This frees the drain plug, which can now be removed.

Attempt to locate your lost item with a retrieval tool. Then, clean the drain plug and re-install. The hole in the bottom of the drain plug needs to receive the horizontal pivot arm on reassembly.

**Tip:** Be careful not to lose any parts, such as washers or seats, when removing the drain stopper mechanism. Also do not over-tighten the nut when re-installing.

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## REMOVING THE P-TRAP

If an item is stuck then it may be necessary to remove the P-Trap. In most cases, the P-trap is easily accessible. If it's not, you might need to call a plumber.

**Note:** Many P-traps have a drain plug at the bottom of the P-trap for cleanout. If your sink has this, you may still need to remove the P-trap to retrieve your item. This drain plug is intended to aid in clean-

ing the P-trap but is probably too small for your dropped item to fit through.

Turn off the water under the sink. Many times people working on drains have to leave the site for one reason or another. Turning off the water prevents someone else arriving on the scene, turning on the faucet and causing a flood.



*The tools shown can help you retrieve lost items from a drain pipe.*

*This photo shows how the drain mechanism connects. The hole at the bottom of the plug receives the pivot arm to open and close the drain. Clean the assembly before reinstalling.*



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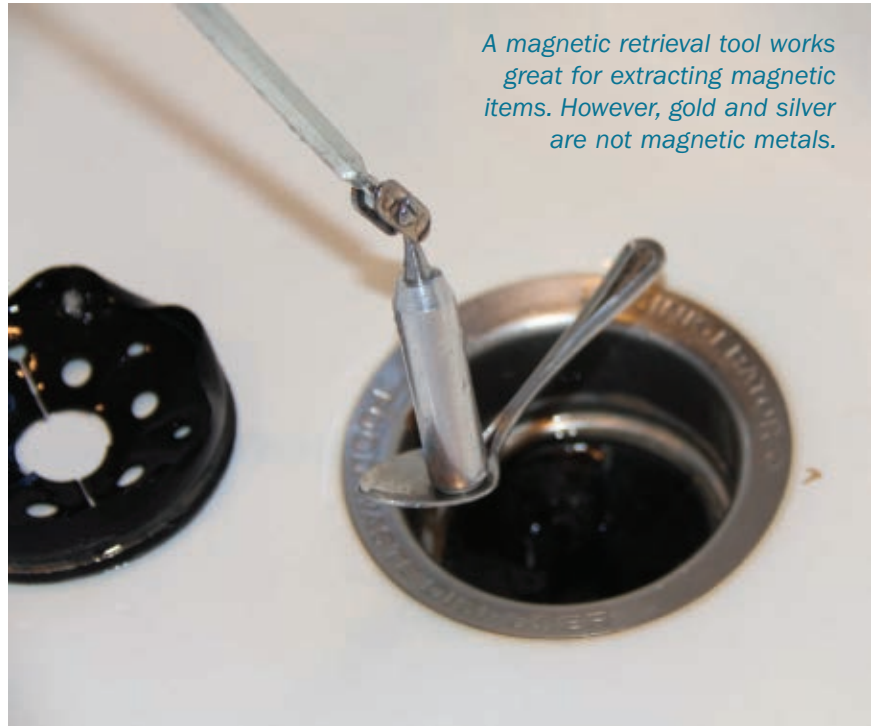
\*Speed percentages based on test results of siding installation tools as conducted and published by James Hardie.





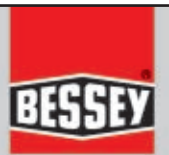


*A prong retrieval tool has prongs on the end for grabbing objects in confined spaces.*



*A magnetic retrieval tool works great for extracting magnetic items. However, gold and silver are not magnetic metals.*

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BESSEY Tools offers two horizontal versions and an Inline version with new offerings coming Fall 2012.

Toggle Video





## DO IT YOURSELF

The first thing you'll want to do is to remove any objects or belongings from the area where you will be working. Place a small bucket or tray under the P-trap to catch the water in the pipes. Failing to do this

will result in water spilling onto your cabinet base or floor, depending on where you are working.

Remove the drain plug at the bottom of the P-trap. This will drain the pipe, and if you're lucky



*A prong retrieval tool has a flexible shaft to snake inside the pipes.*



*The pronged tool can retrieve non-magnetic jewelry.*

your object may fall out. If it does, then replace the nut, turn on the water and test for leaks.

Otherwise, locate the two "slip nuts" on each side of the P-trap bend. Using Channellock pliers or an adjustable wrench, turn the slip nuts counter-clockwise to remove them. Remember that sometimes these nuts are screwed from the bottom up, so make sure you are turning them the correct way. Water may leak out as you loosen these nuts. Loosen the nuts one at a time, leaving the first nut on by a thread or two so that when you're loosening the second nut, the trap does not fall on you. Be careful not to strip the slip nut threads.

**Tip:** To protect chrome, copper or brass decorative drain pipes

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## DO IT YOURSELF

from wrench marks, wrap the slip nut with a rag and place your pliers over the rag.

Once you have removed the two slip nuts, dump the pipe

contents into your pan. Hopefully the item that was dropped in it will fall out. Otherwise, try retrieving it with needle-nose pliers.

Clean the P-trap with hot water

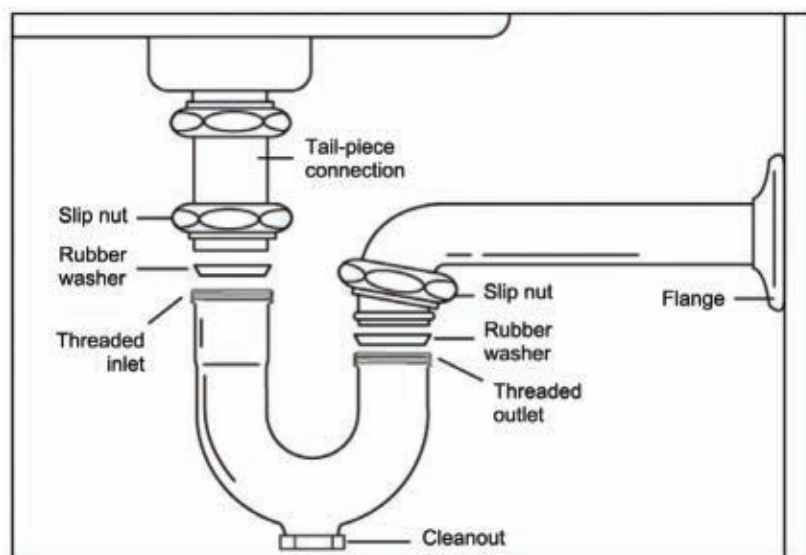
and soap before replacing.

Replace the trap, align the pipes and tighten both slip nuts by hand before using the wrench. Make sure the nuts screw on easily and do not strip the threads.

Turn the faucet on and run the water, checking for leaks. If you see any leaks, tighten the slip nuts, wipe the area and check for leaks again.

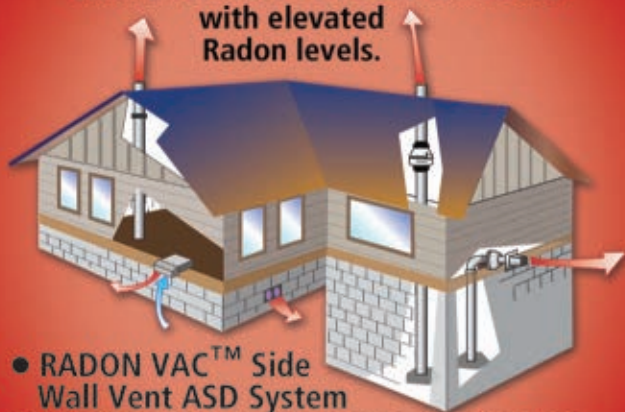
**Note:** On drains with only one slip nut you may have to cut the pipe. This is the time to call a plumber unless you are skilled in working with plumbing.

*Shown are the typical components of a sink's P-trap.*



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*Small-profile work lamps are a big help for lighting the cramped area beneath sinks.*

*Some P-traps have a drain plug at the bottom for cleanout.*



*The drain plug can empty water from the trap, but dropped items are usually too large to fall out of the cleanout hole.*

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## DO IT YOURSELF

### GARBAGE DISPOSALS

If you've dropped an item down a sink with a garbage disposal, exercise extreme caution. Make sure to unplug or shut off the power to the disposal.

If the item is visible, unplug the disposal and then use a wooden spoon, tongs or a retrieval tool to remove the item from the garbage disposal.

If the item you've dropped is



*To protect pipes from wrench marks you can wrap them with cloth before unscrewing.*



*Channellock or slip-joint pliers work best for removing P-traps.*

magnetic, use a magnetic retrieval tool or try dangling a magnet tied to a string down the drain to retrieve the item. While most jewelry is not magnetic, sometimes a steel clasp will provide the necessary magnetism to make this work.

If the item was caught in the grinder, it has probably damaged the disposal. Contact a plumber to evaluate. **EHT**

**Editor's Note:** Robert Robillard is a remodeling contractor based in Concord, Ma. Visit his website at [www.AConcordCarpenter.com](http://www.AConcordCarpenter.com)

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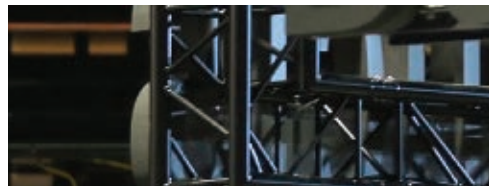






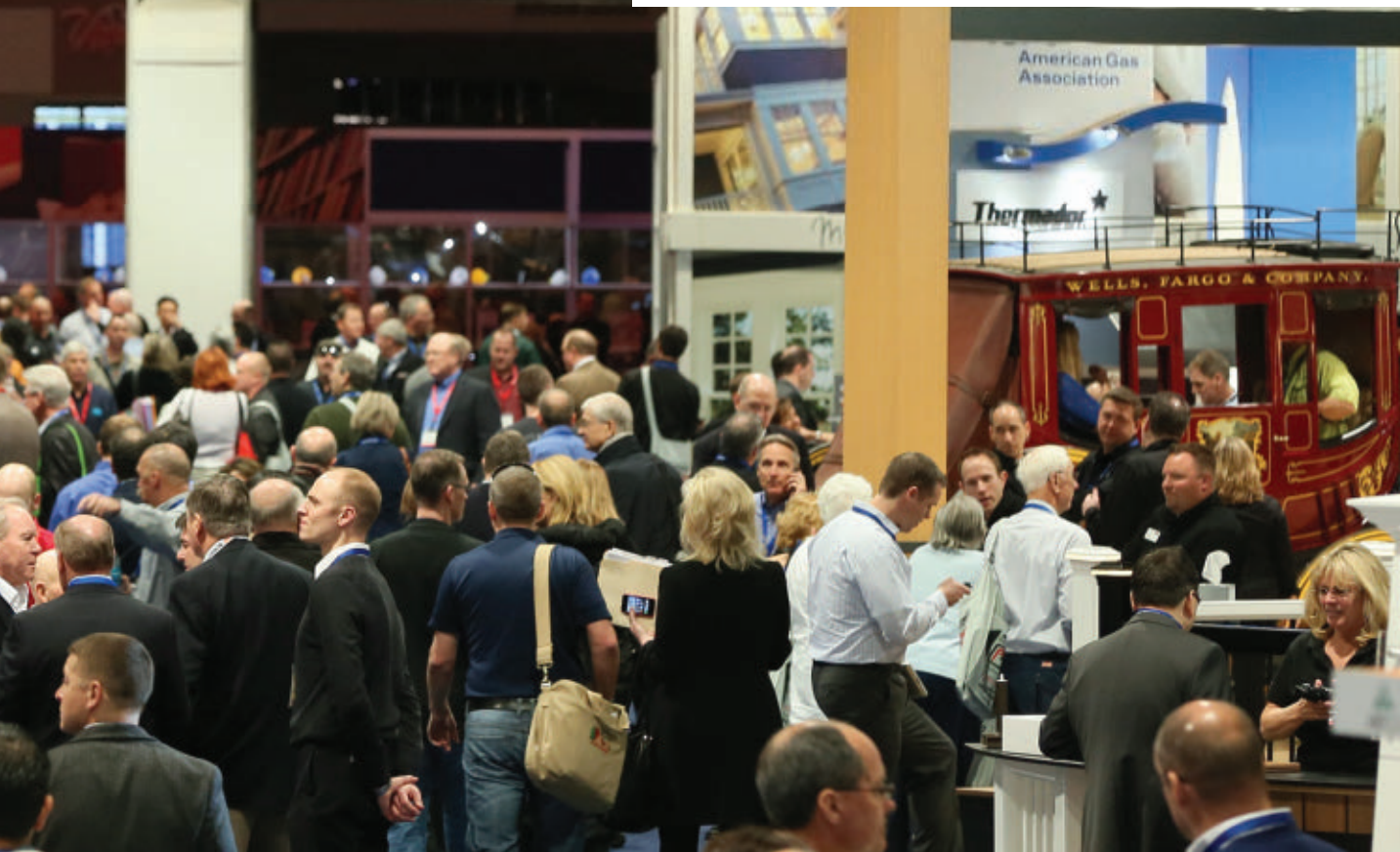
# IBS™

2014 NAHB International Builders' Show®



On February 4-6, more than 75,000 builders, remodelers, developers, architects and other industry professionals from over 100 countries will congregate in Las Vegas, Nevada, for the International Builders' Show. For the first time, the National Association of Home Builders (NAHB) and the National Kitchen & Bath Association are co-locating IBS and the Kitchen & Bath Industry Show (KBIS). Between these two major conventions, the anticipated number of exhibiting companies is expected to top 1,500. It will be the one place in North America that the entire building industry comes together in 2014.

Here's a preview of some of the many products that will be exhibited.





## PEEL & SEAL

Peel & Seal from MFM Building Products is a tough, dependable waterproofing membrane for a multitude of applications. It is an ideal DIY solution for flashing around chimneys, roof vents, ducts, skylights, dormers and other difficult-to-waterproof items. It is also perfect for repairing gutters, smooth asphalt or metal roofs. The self-stick properties make installation quick and easy. A sharp utility knife and hand roller are the only tools needed. Peel & Seal is designed to be left exposed to the elements, so no coatings are required. Peel & Seal can also be used on mobile homes, RV campers and other EPDM surfaces when using WeatherBond Multi-Purpose Primer. Backed by a 10-year limited warranty, Peel & Seal and WeatherBond can be purchased on the MFM website or through building products distributors around the country. Visit [www.mfmbp.com](http://www.mfmbp.com) or stop by booth C8406

## CONSTRUCTION MASTER PRO

The award-winning Construction Master Pro from Calculated Industries has been helping builders, carpenters, remodelers and skilled DIY'ers get it right the first time, every time, for more than 30 years. The Construction Master Pro is an advanced feet/inch/fraction construction-math calculator with powerful built-in solutions that will help you improve design accuracy, save time and reduce material waste. With the Construction Master Pro you can convert between feet, inches, fractions and decimals, including metric. Enter measurements in feet-inches and fractions just like your tape measure reads and instantly calculate complex



construction challenges for framing, stairs, decks, roofs and more. Built-in solutions include: Roof, Rafter and Framing Solutions (hip/valley, jacks, cutting angles, rake-walls); Stair Calculations (treads, risers, stringers, stairwell opening, etc.); Circular Calculations (arcs, area, circumference, etc.); as well as calculations of area, volume, square-up, etc. Visit [www.calculated.com](http://www.calculated.com) booth C3254.



## NEW WAVE IN ROOFING—ONDUVILLA AND ONDURA

Onduvilla and Ondura roofing systems are innovative, attractive alternatives to traditional roofing products. They can be installed directly over old existing roofing, such as shingles and metal, preventing tear-off and saving time and money. They can be cut without special tools, adapt to any standard roof structure, and even be walked across without damaging the product. Onduvilla shingles offer the distinctive, raised appearance of a Mediterranean tile roof, with all the advantages of shingles. Not only attractive, Onduvilla is backed by exclusive SealSmart technology—its composite material shrinks firmly around each nail, creating a permanently leak-resistant barrier. The corrugated design of Ondura sheets and tiles enables them to be both lightweight and strong. With total asphalt impregnation, they outlast almost all other roofing, including metal. Both products boast Lifetime Limited Warranties, are



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## THE DECK HARNESS

The Deck Harness from GRK Fasteners is a lateral load connector device that consists of a steel chain-linked assembly with a thermoplastic plug in the center. The plug is installed through the house deck ledger/rim board. One end of the deck harness is attached to the primary structure floor joist with a U-bolt and washer plate. The other end of the Deck Harness is attached to the deck joist with identical U-bolt and washer plate. The correctly installed device will then inhibit a deck from fully collapsing due to ledger board failure. The ICC (International Code Council)

requires a minimum of two Deck Harnesses per deck, and this method is very easy to install and well worth the investment. In the event of deck failure and the deck separates from the house, the Deck Harness kicks into full gear and keeps it from completely collapsing. Visit [www.grkfasteners.com](http://www.grkfasteners.com) or booth S2438.

## TILEABLE COVERING SUPPORT FOR SCHLUTER-KERDI-DRAIN

In response to the growing design preference for sleek, discreet drainage lines, Schluter-Systems has introduced a new tileable covering support to its Schluter-KERDI-DRAIN product line. The frameless, tileable covering support features a square stainless steel plate with Schluter-KERDI laminated on the surface to allow for bonding of ceramic

or stone tile, creating a virtually invisible drainage line. The KERDI-DRAIN is a floor drain specifically designed to allow connections to Schluter-KERDI or other bonded waterproof membranes. The membrane is adhered to the large integrated bonding flange to form a waterproof connection at the top of the drain assembly. The KERDI-DRAIN grate assembly allows for lateral and tilt adjustment and



accommodates a wide range of tile thicknesses. The covering support is placed flush with the top of the bonding flange and can therefore accommodate any thickness tile covering. Visit [www.schluter.com](http://www.schluter.com) or booth N635.

## MAZE NAILS

Maze Genuine Double Hot-dipped galvanized ring-shank coil roofing nails are 100-percent made in the USA. The nails are also approved by Miami-Dade County to withstand the strong



winds associated with hurricanes. Both plastic- and wire-collated 15-deg. nails are designed to fit a wide range of roofing nailers, including Bostitch, Hitachi, Senco, Max, Fasco, Porter-Cable and more. Visit [www.mazenails.com](http://www.mazenails.com) or booth C6647.





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## DSI POWDER-COATED RAILING

Digger Specialties, Inc., a nearly 30-year old family owned business, manufactures aluminum railing, fencing, columns, continuous hand rail, vinyl railing and fence systems. This year, DSI expands their plant with a "state of the art" powder-coating line. DSI is now a certified PCI 4000 A2 (AAMA 2604) & A3 (AAMA 2605) manufacturer of architectural-grade, powder-coated aluminum railing, column and fencing systems. One of the featured products is the Westbury Railing System, which has been tested and evaluated to meet and exceed the IBC, IRC and FBC Building Codes. According to the company, Westbury is the only aluminum railing that is certified by the Powder Coating Institute (PCI) and has been tested and verified for AAMA 2604 & 2605 standards. Visit [www.diggerspecialties.com](http://www.diggerspecialties.com) or stop by booth S1443.

## BELLAFORTÉ SHAKE

Bellaforté Shake polymer roofing tiles from DaVinci Roofscapes have a multi-width appearance that replicates hand-split real cedar shakes with slanted sawn

edges and staggered lengths. The tiles feature snap-fit tabs and a self-alignment ledge for easy installation. The roofing tiles come in 49 colors and a selection of five color blends, including Abruzzo, Espresso, Tuscano, Verona and



Harbor Gray. The polymer tiles resist curling, cracking and fading, mold, algae, fungus and insects under normal conditions. The tiles have also achieved the highest standards for wind, fire and impact resistance. Additionally, DaVinci roofing tiles resist water absorption, which eliminates freeze-thaw issues and allows for installation in all weather conditions. Available nationwide, a square of Bellaforté Shake (with 100 pieces per square) weighs

just 190 pounds. This lower tile weight helps reduce installation time and transportation costs. Just as with other DaVinci products, the Bellaforté Shake tiles are 100-percent recyclable and come with a 50-year limited warranty. Visit [www.davinciroofscapes.com](http://www.davinciroofscapes.com) or booth C2136.

## PULSE MODERN-STYLE DOORS

Clean lines and crisp angles configure together to deliver the sleek, modern designs of the new Pulse studio of doors from Therma-Tru. Iconic details with a vintage flair lend a nostalgic appeal to these doors. Available in oak-grained fiberglass, smooth fiberglass and steel, Pulse doors come in both 6 ft., 8 in. and 8 ft. heights. The Ari, Solei and Echo styles in Pulse are available in four privacy glass options along with clear Low-E and internal blinds. The Línea style is available with these same glass insert options plus decorative glass options of Blackstone, Crystalline, Sedona, Salinas, Element, Maple Park, Avonlea, Saratoga, Texas Star, Arden and Crystal Diamonds. Visit [www.thermatru.com](http://www.thermatru.com) or booth C6108.





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## -SIMONTON AND FYPON

Simonton and Fypon join together to showcase Simonton's ProFinish Brickmould 600 new construction windows that feature Decorum by Simonton collection options. Decorum is a product line that offers exterior color frames which complement the overall look of the home, such as brick red, pine green, bronze, driftwood and chocolate. Simonton will also show a 3-lite Reflections patio door and windows in the Impressions 9800 series. Fypon



will showcase a variety of urethane and PVC millwork pieces, including new woodgrain column wrap kits and door surrounds. Visit [www.simonton.com](http://www.simonton.com), [www.fypon.com](http://www.fypon.com) or booth C6113.

## VENTILATION SYSTEMS FROM TJERNLUND PRODUCTS

Tjernlund Products offers innovative ventilation fans for home health and comfort. The Xchanger Reversible Ventilation Fans and UnderAire Crawl Space Fans comply with ASHRAE ventilation standards, improve indoor air quality and are a great solution for damp, musty basements and crawl-spaces. AireShare room-to-room or level-to-level transfer fans add



comfort in hard-to-heat or hard-to-cool spaces, presenting a great option for split-system or window air conditioning. The Balance Booster Reversible Transfer Fan is a unique air-transfer system that economically balances temperatures in multi-level homes. Also available are the Radon VAC Side Wall Radon Mitigation System, the Sure Dry Shower Drying Systems, and the Auto-Draft Chimney Top Fans for solving draft problems on solid fuel and gas fireplaces. Visit [www.tjernlund.com](http://www.tjernlund.com) or booth S2023.

## MURO AUTO FEED SCREWDRIVERS

Muro North America Inc., an originator of Auto Feed Screw Driving technology, will be exhibiting the company's latest variety of tools and fasteners. From decking, drywall, subfloor installation and more, Muro offers the right fastener, whether you prefer coil-feed or strip-feed systems. Visit [www.muro.com](http://www.muro.com) or booth C8510.





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that do-it-yourselfers can normally complete within a half-hour. Visit [www.johnsonhardware.com](http://www.johnsonhardware.com) or booth C6120.

## CONCRETE SOLUTIONS COOL-IT

Rhino Linings Corporation, a leader in protective coatings, announces the release of Concrete Solutions Cool-It, a heat-reflective concrete stain and sealer. Cool-It is designed to reduce the temperature of outdoor surfaces while also providing a uniform, protective, colored finish. It is ideal for pool decks, sidewalks, patios and benches and is available in nine popular colors. Cool-It has good



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## STARRETT COMBINATION SQUARE

Since Starrett invented the combination square in 1878, it has become one of the most versatile measuring tools you can have. Perhaps the most common use is to mark a straight line perpendicular to the edge of a board to make a square cut. The tool also makes it simple to draw lines parallel to the edge of a board. By moving the head



set distance, you can create multiple lines that are spaced an equal distance apart.

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it's possible to quickly and accurately find the center of a circle, a dowel or rod.

This tool can also be used to verify and recalibrate a compound miter saw, a table saw, a jointer and even a router when they fall out of calibration. The combination



square head is a precise gauge for checking accuracy of these power tools.

Check out "Starrett

Combination Square Tricks" on YouTube and visit booth C7049.

## SURE DRIVE DECK FASTENERS

Sure Drive USA offers a variety of deck screws designed to achieve maximum driving performance, with a variety of corrosion-resistance options. The company's popular Rustguard Decking Bullets are coated to provide excellent protection against rust and corrosion. For the "ultimate" in corrosion protection Sure Drive's Seamaster line is made of high-grade 305 stainless steel. All deck screws come with either a Type-17 cutter point or Sure Drive's patented serrated-teeth thread design that slices through even the toughest materials without splitting.

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decking usually has a softer core but a tough exterior "wrap" that makes it difficult to penetrate. The Sure Drive CCDS starts quickly and eliminates "mushrooming" of



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Leading the development of premium, low maintenance, exterior building products, AZEK and TimberTech have united under CPG Building Products. On display will be several new co-branded railing components and accessories for easy assembly of AZEK or TimberTech Railings. TimberTech will also unveil four dramatic new capped composite colors, in styles ranging from rustic to elegant. AZEK Pavers, made with up to 95 percent recycled content, will add new sizes and profiles. In addition, as the leading brand of low-maintenance PVC decking, AZEK Deck will now feature the XLM product line, award-winning DeckLites and exclusively designed hidden fastening systems. Visit the AZEK/TimberTech booth C3015. **EHT**





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# DIY HOME INSPECTION

Discover small problems before they get big.

Photo © Iriana Shiyani / 123rf.com





**T**he purpose of a home inspection is to examine the inside and outside of a home, including the grounds, the structure and mechanical systems. The inspector looks for defects, broken or obsolete components, and damage due to weather, rot, or wear and tear. A qualified professional inspector then provides the customer with an itemized and detailed summary of the findings.

While a do-it-yourself inspection won't be nearly as thorough as hiring a pro, a yearly examination of your house is a good way to analyze your property and determine any necessary repairs you can make to prevent bigger problems in the future. Plus, you can take some cues from the pros regarding how to organize your inspection and how to look for red flags that can lead to more trouble down the line.



# DIY HOME INSPECTION

Today's building codes generally recommend that water should be diverted 10' away from the house foundation. This can be accomplished with proper grading, along with downspout extensions, splash blocks or downspout drains.

*Check the roof for worn or missing shingles and flashing. Use binoculars to inspect all roof penetrations, including the chimney. Make sure the gutter is free of leaks and clogs. Gutter covers help to keep leaves and debris from accumulating and impeding drainage.*



## SITE ANALYSIS

According to Robb Graham, president of Professional Home Inspection Institute, a home inspection boils down to three major considerations: Water, Safety and HVAC. "For example, one area of a home inspection is site, grounds and grading, and the primary concern is proper grading to ensure water is running away from the house," says Graham. "Another area of inspection is sidewalks, and ensuring cracks will not create a tripping hazard, which is a safety concern."

The home inspection typically

begins with a site analysis, examining in particular the drainage and grading of the property. Proper grading ensures that surface water is directed away from the foundation. Poor drainage can lead to accumulated hydrostatic pressure against the home's walls, which can cause basement walls to buckle, or lead to water erosion, which can weaken the home's foundation. The grading should be sloped away from the house, dropping 6 inches for every 6 feet.

You'll need a flashlight to inspect crawlspaces and unlighted basements for any signs of water

penetration or cracks through foundation walls. A 4-ft. level will help determine if foundation walls or exterior retaining walls are listing or bowing from external pressure—problems that can eventually lead to collapse. Use a pick, screwdriver or awl to check areas for wood rot or decay in the framing. Wood rot is caused by a fungus and is as damaging as termites.

Check framing members near the ground for signs of termite infestation. Termite-damaged wood shows mud tubes that are lined with dirt. Termites' wings also



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# DIY HOME INSPECTION

fall off easily, so a pile of wings is another clue to their presence.

Cracks in a floor slab or evidence that it is heaving upward probably indicates a high water table. Installation of footing drain tiles can counteract problems associated with a high water table.

If a home has a sump-pump, then drainage is probably an issue. Check the foundation perimeter for ruts on the ground or bare spots where the grass has eroded. This may indicate more water flow than the ground can absorb, which leads to erosion and could eventually weaken the foundation. Installation of drainage conduit can provide a solution.

Inspect trees and landscaping as well. Tree overgrowth can lead to too much shade, which can contribute to mildew and rot on



*Not all rot is as evident as this badly damaged window. Use a pick or awl to prod the wood casing and trim of doors and windows. Look for peeling paint and soft, spongy wood.*

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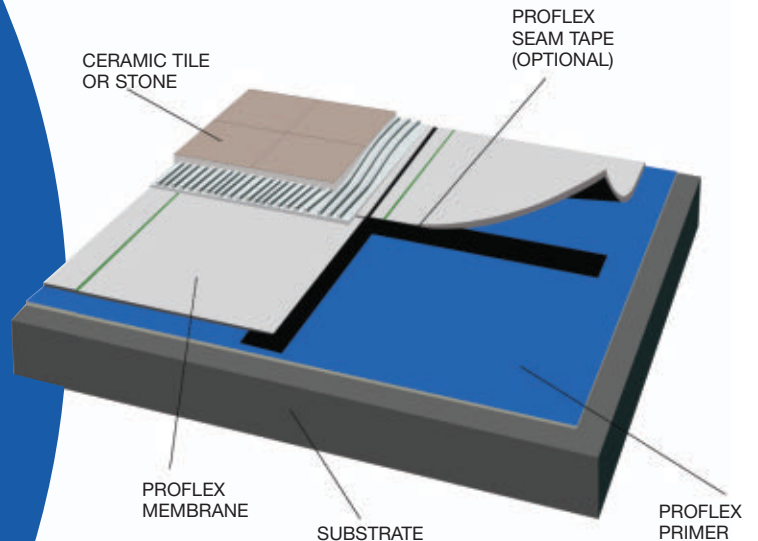


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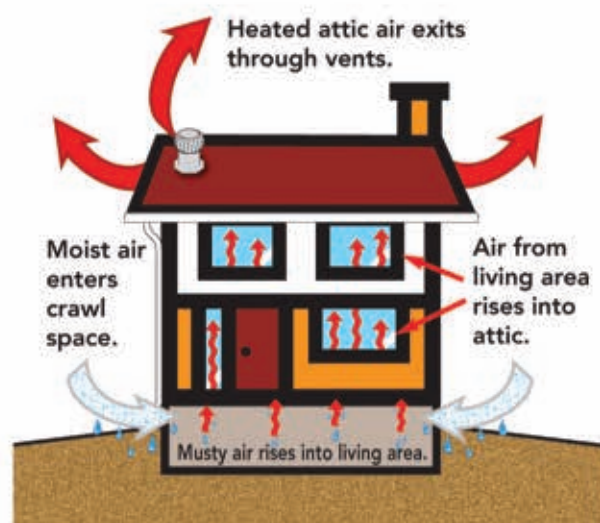
**Everything you need in one place.** If you're closing a crawl space, we want to encourage you to try the products from Crawlspace Depot. Our team has searched the country for the best products available. We test all our products in actual crawl spaces to make sure they deliver the performance you need to do the job right. And when it comes to pricing, you'll see we bring you the lowest prices possible.



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**Why close a crawl space?** No amount of ventilation will solve the problems modern day air conditioning causes. Outside air entering through the vents can create condensation on any surface below the dew point temperature, such as floor joists, insulation and pipes and ducts. This constant condensation causes wood rot and mold, and attracts all types of insects, including termites.

## Stack Effect



Closing a crawl space, which includes sealing the vents, insulating the walls, creating a vapor barrier and conditioning the air in the crawl space, is now considered the best practice standard. Leading research by Advanced Energy under a grant from the U.S. Department of Energy ([www.crawlspace.com](http://www.crawlspace.com)) identified the common symptoms of a crawl space moisture problem as mold or moisture damage in the crawl space or living area, musty odors and high humidity in the living area, condensation ("sweating"), buckled hardwood floors, insect infestations, and rot in wooden framing members.

Closing the crawl space creates a clean, conditioned space under the home, improves air quality throughout the home, saves up to 18% in heating and cooling cost in the Southeast,\* reduces mold and wood decay on floor joists, reduces buckling of hardwood floors, creates warmer floors in the winter and reduces pest and termite pressure.

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# DIY HOME INSPECTION



*If you find deteriorated caulking around the doors and windows of your home, then cut away the old stuff and replace with a new high-quality exterior sealant. This helps protect the home from air, water and pests.*

the house. Overgrown trees and shrubs that contact the house can lead to pest infestation and should be trimmed back.

Inspect all walkways, driveways, patios and stairways for any disrepair or damage that can cause a safety issue. All stairways must have a concrete footing and foundation. Make sure the steps don't tilt, heave or sink to one side. Generally any platform above grade must have a sturdy handrail system. Current building codes stipulate that handrail balusters are spaced no more than 4 inches apart so children can't get their heads stuck between them.

Check all decks, porches and balconies for structural integrity. For decks attached to the house, pay close attention to the ledger board connection, which is prone

to rot and water damage if improperly installed and is a common cause of deck collapse.

## HOUSE EXTERIOR

Inspection of the home's exterior begins with the foundation and footings, looking for cracks, bulges or excessive settlement. Hairline cracks in the foundation may be only cosmetic shrinkage cracks that occur as the foundation cures, but they should be monitored. Cracks that are V-shaped (wide at top, narrow at bottom) are likely caused by uneven settlement of the footing and usually worsen over time. A crack that runs from the wall and continues to the floor may also indicate a significant settlement problem. If this is the case, excavation below the existing foundation may be necessary to build a support foundation.

You can check for floor framing problems in the basement. Look for twisted, damaged or rotted joists that can cause a weakness in the floor area. A sagging floor may be caused by a sagging main bearing beam, which can be caused by support columns spaced too far apart. There should be double floor joists under all wall partitions to prevent sagging from the wall's weight.

Any evidence of bulging or bowing exterior walls could indicate a problem with the studs. Studs can

An advertisement for Metal Ceiling Express. It features a collage of various ornate tin ceiling tiles in different colors and patterns, including gold, silver, and green. The text reads: "METALCEILINGEXPRESS.COM", "Tin Ceiling Tiles | Nail-up | Drop-in | Snap-Grid | Backsplash | Crown Moldings", "Authentic Tin Ceiling Tiles | Factory Direct", "32 Patterns | Hand Faux Finished Tiles", "Fast Deliveries | Top Quality", "1650 12th St East | Palmetto, FL 34221", "MetalCeilingExpress.com | 941.723.2288". At the bottom, there are logos for VISA, Discover, American Express, and MasterCard.



*Hydrostatic pressure forces water through this foundation wall, which indicates a drainage problem outside the home.*



warp if water has penetrated the wall and contacted the wood.

Inspect the home's windows for proper and safe operation and check the casings for rot—a common problem with wood windows. Use an awl to test the integrity of the wood. Look for flashing above and around the window. Instead of flashing, the window may have wood molding to divert water, but the molding is subject to rot and can allow water to penetrate the building. Make sure that caulking is in good condition, which prevents water penetration as well as air intrusion that can lead to cold spots in the home.

At the doors, check the thresholds for normal wear and tear and wood rot. Make sure they operate properly and that the hinges are firmly attached.

Wood trim is susceptible to rot and moisture damage. Check for warping, splitting, peeling paint and missing caulking.

"Another area of home inspection is the roof system," explains Graham, "which is ensuring rain, snow, and moisture do not enter the house."

Use a ladder to inspect the exterior of the roof for loose or missing shingles. Look for shingles that are blistered, cracked, buckled or curled at the edges, or gutters filled with large amounts of granules, which could indicate the shingles are nearing the end of their useable life. Check for worn or missing roof flashings, and look for any signs of roof deck bowing, expansion or waviness, which indicate a problem with the framing.

Chimneys should extend 3 feet above the highest point where it passes through the roof and at least 2 feet higher than any portion of the building within 10 feet. Check for structural cracks to the exterior or evidence of smoke



*The IRTC50 infrared thermometer from General Tools & Instruments provides remote temperature measurement with the pull of a trigger. It's an easy way to locate hidden hot and cold spots when performing an inspection. With its Star Burst laser targeting system, the IRTC50 enables the user to approximate the size of the measured spot for a quick and accurate reading.*

escaping through mortar joints. Look for a distorted or discolored rain cap. Look for creosote flakes on the roof and ground, or damaged roofing material from hot creosote that could indicate a dangerous accumulation.

Inspect all skylights, vent stacks and similar roof penetrations for proper flashing and signs of leakage.

Inspect the gutters and downspouts for any leaks or cracks. Make sure they're free of leaves, dirt or other debris that might impede drainage. A leaky gutter can lead to water accumulation at the foundation, and clogged gutters can lead to poor drainage and even ice dams at the roof line.

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# DIY HOME INSPECTION

At the mouth of the downspouts, pull out your tape measure. Today's building codes generally recommend that water should be diverted 10 feet away from the

house foundation. The further away the water flows, the safer the home. This can be accomplished with downspout extensions, splash blocks or downspout drains.

Check your exterior cladding for structural integrity, secure attachment and any signs of rot or water penetration. Always check for functional weep-holes in brick and brick veneer. In stucco, check for cracks due to the expansion of the plywood sheathing beneath it. Any size crack in stucco will allow moisture to penetrate. When inspecting EIFS (Exterior Insulating Finish System), professional home inspectors use a special wall moisture meter to detect unseen areas that contain moisture behind the wall surface.

Don't forget to inspect the garage. "The garage can have a lot of safety hazards," says Graham, "from the firewall to fire-rated doors, to garage doors that are not calibrated correctly. A garage door with incorrect settings (for the downward force on the door) can damage a car, or worse, can

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# DIY HOME INSPECTION



come down upon a small child. A garage door must also have a sensor that triggers it to return up if there is an item blocking the door."

## HOUSE INTERIOR

Your interior inspection should proceed in an orderly fashion to make sure nothing gets missed. Professional home inspectors often use an itemized checklist to keep track of the many similar components found in each room. By virtue of living in the home, you're probably aware of most of

your home's problems, but it's a good idea to pay close attention to the rooms you rarely occupy. Examine the walls, ceilings, floors, doors, window, stairways, counters and cabinets. The attic, fireplace, basement and/or garage are also included in the inspection. Some inspectors start at the attic and work down; others start at the basement and work upward. The most important inspection criteria should be the safety of the occupants, followed by the functionality of the house components.

*Professional inspectors use moisture meters to check moisture content behind surfaces like bathroom tile and EIFS. The MMD950 Deep Sensing Moisture Meter from General Tools has two measurement modes: Pin and pinless. The pinless mode uses an integral ball sensor with up to 4" measurement depth.*

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"For the interior, look for signs that there may be water issues," suggests Graham, "Interior doors that are shifting can be a sign the foundation is shifting due to water pressure."

A wall or ceiling may sag if it has been exposed to water. You should determine the source of any water penetration and address it immediately. Also, check for popping nails that may indicate inadequacies in the wall framing.

When plaster walls are exposed to water and then dry, the plaster can turn into a powdery substance with no structural integrity. Over time, plaster can crack and loosen due to temperature changes and natural shrinkage. Hairline cracks are not a major concern, but plaster that detaches from the wall could pose a safety hazard.



*If people in the home are susceptible to allergies, then it's smart to inspect the air ducts for accumulated dust, mold, etc. We found a lot of pet hair inside this duct. General Tools makes the 80560 Lighted Telescoping Inspection Mirror for peering into the dark crevices of your home. The telescoping shaft extends from 12-1/4" to 33".*

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# DIY HOME INSPECTION

On walls with wood paneling, make sure the panels are not bowing or warping, which could indicate moisture behind the wall.

"Look for humidity issues or

problems in all areas, but especially the attic," says Graham.

"The attic area can have serious problems with humidity, and must have proper ventilation. Humidity

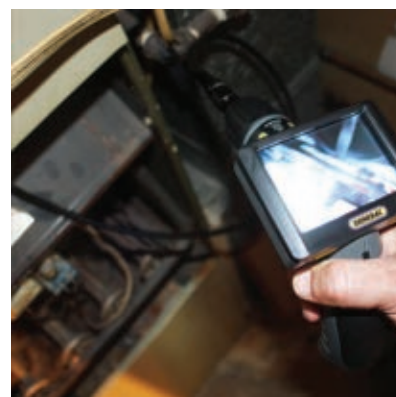
problems can originate from a bathroom vent that terminates in the attic, as well as roof leaks."

When inspecting bathrooms, make sure that shower pans aren't leaking by checking the ceiling beneath them for signs of moisture or stains. A moisture meter is a good tool to test for moisture hidden behind bathroom tiles.

Check the ceilings for nail pops, cracks or sags that could indicate underlying structural problems. If the ceiling joists are causing the ceiling to sag, this not only stresses the ceiling but the adjacent walls as well.

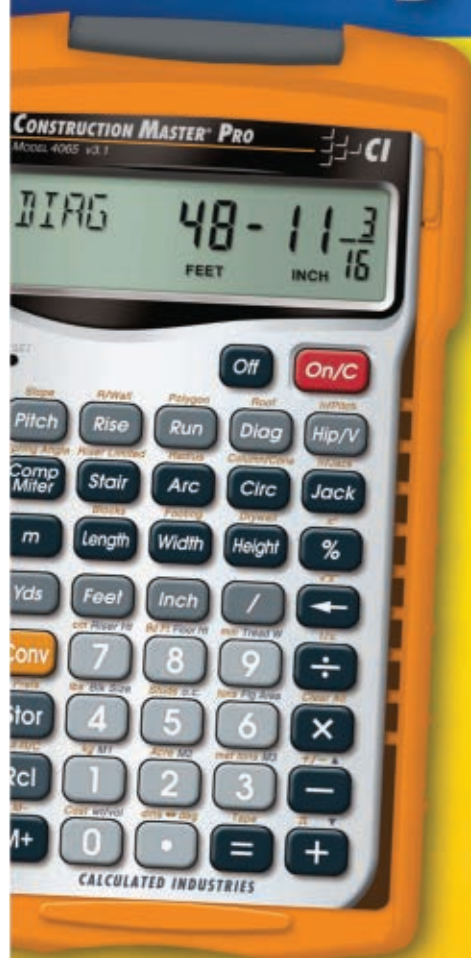
Make sure suspended ceilings are securely fastened. Pro inspectors check behind the panels to make sure the grid wasn't constructed to hide a problem that may or may not have been addressed.

Make sure all doors and windows operate properly in case of fire. All stair railings should be tightly secured and have no loose treads or risers.



*To inspect difficult-to-access areas around machinery and appliances, the Seeker DCS300 Video Inspection System from General Tools features a flexible camera-tipped probe with built-in LED lighting that's strong and slim enough to perform automotive engine check-ups. It comes equipped with a large, 3-1/2" monitor with a color LCD screen.*

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"The electrical system can have safety concerns with anything that is wired incorrectly," says Graham. "Faulty wiring can cause major safety issues, as well as shock hazards, and inspectors also note the use of GFCI circuit breakers, which provide safety in case of a ground fault." Professionals inspect the electrical service drop, the breaker box as well as the condition of any exposed wiring. They often use a three-

*General Tools' PNG2000A Combustible Gas Detector Pen is ideal for inspectors, contractors and homeowners to check gas leaks in plumbing and appliances.*

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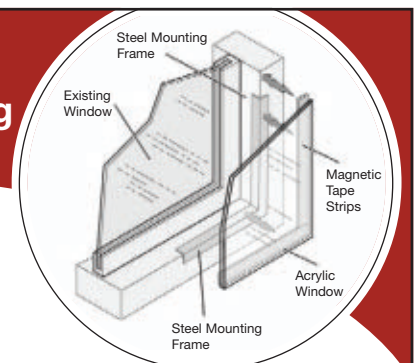
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## HOME INSPECTION AS A PROFESSIONAL CAREER

More than 75 percent of people purchasing a home will call on the services of a home inspector to give the property a so-called checkup. With so much demand, home inspection can be a very promising, rewarding, fun but challenging career choice. A home inspector has to constantly keep up on education, be aware of new technologies and constantly market their business.

A professional inspector follows specific Standards of Practice, either from a home inspection association such as ASHI or NAHI, or they may live in a state that regulates home inspectors through specific state standards. Some states can have rigorous requirements. Education is very important, because home inspectors have to know about the major systems in the house. By going through a professional training school such as American Home Inspectors Training Institute (AHIT), inspectors in training can learn how to properly inspect a home, fill out the inspection report and how to successfully market their business, regardless of their background.

Learn more about pursuing a career in professional home inspection at the AHIT website, [www.ahit.com](http://www.ahit.com).

pronged circuit analyzer to make sure wall receptacles are operating in the appropriate 120-volt range. Low voltage may be caused by a wire that is too small for the electrical load, a circuit that is too long, or conductors that have a higher resistance when operating at high temperatures.

Inspect your chimney interior for signs of creosote buildup, deterioration of mortar or other damaged components that could pose a fire hazard.

Your DIY inspection is also a great time to check the functionality of the smoke detectors in your home.

### PLUMBING AND HVAC

"The plumbing system is dealing with water and ensuring the water is flowing correctly," says Graham. Check pipes for leakage, corrosion and adequate insulation.

The most efficient way to inspect the plumbing system is to proceed room by room. Check all plumbing



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# DIY HOME INSPECTION

fixtures for proper drainage as well as the functionality of shutoff valves.

In older homes, make sure the home isn't still using lead pipes, which is a health hazard. Apply a magnet to metal pipes. If the magnet adheres, the pipe is made of galvanized steel; if not then it's likely a lead pipe.

If the home uses well water, visually inspect the storage tank and other components and test the well pump.

One way to verify that your house has adequate water pressure is to turn on all the faucets. There should still be a steady stream of water coming from each of the faucets. If not, the pipe diameter could be too narrow.

"The HVAC system is not related to safety or water, but instead to performance," notes Graham. "With older systems, an inspector would open the furnace and inspect the flames and other

parts. Newer furnaces cannot be inspected in that manner."

HVAC is a very broad category encompassing a wide range of systems, from the popular hybrid systems that couple a furnace with an air-conditioner to geothermal systems that extract heat stored in the earth. HVAC systems can be powered by electricity, gas or oil. They can be configured as forced air-systems, boilers, steam or radiant systems. If you aren't well-versed in the technology of your system, then it's good idea to have your home's HVAC system inspected annually by a certified technician.

## WRAPPING UP

In a buying situation, a professional home inspection takes the pressure off the realtor and seller of the home, and it helps assure the purchaser. "If a home has a problem, and it's not

inspected," explains Graham, "then the buyer might not know about an issue that is expensive to fix." And surprise repairs generally don't make new homeowners happy.

The same holds true for existing homeowners. By carefully analyzing your home for signs of wear, rot, damage or malfunction, you can address problems before they worsen and head off issues before they require a more costly, stressful and disruptive repair. **EHT**

***Editor's Note:** The Professional Home Inspection Institute (PHII) provides training for home inspectors nationwide. The training is online and easy to follow. Each lesson has learning material in pictures, text, video and audio, and there are practice quizzes and flash cards to help learn the material. Learn more about PHII at [www.homeinspectioninstitute.com](http://www.homeinspectioninstitute.com).*

## CLOSING YOUR CRAWL SPACE

Closing crawl spaces saves energy costs, prevents the fallout from built-up moisture and improves air quality throughout the home. It also eliminates conditions conducive for termites and mold, and improves equipment performance in the crawl space.

Vented spaces worked before air conditioning, but now when a family cools their home to 72 degrees and the air outside is 85 degrees with 80-percent relative humidity, it creates condensation on the floor joists, insulation, pipes and ducts. Ventilation won't solve the problem anymore. This constant condensation during the summer causes wood rot, mold and musty odors, and attracts all types of insects, including termites.

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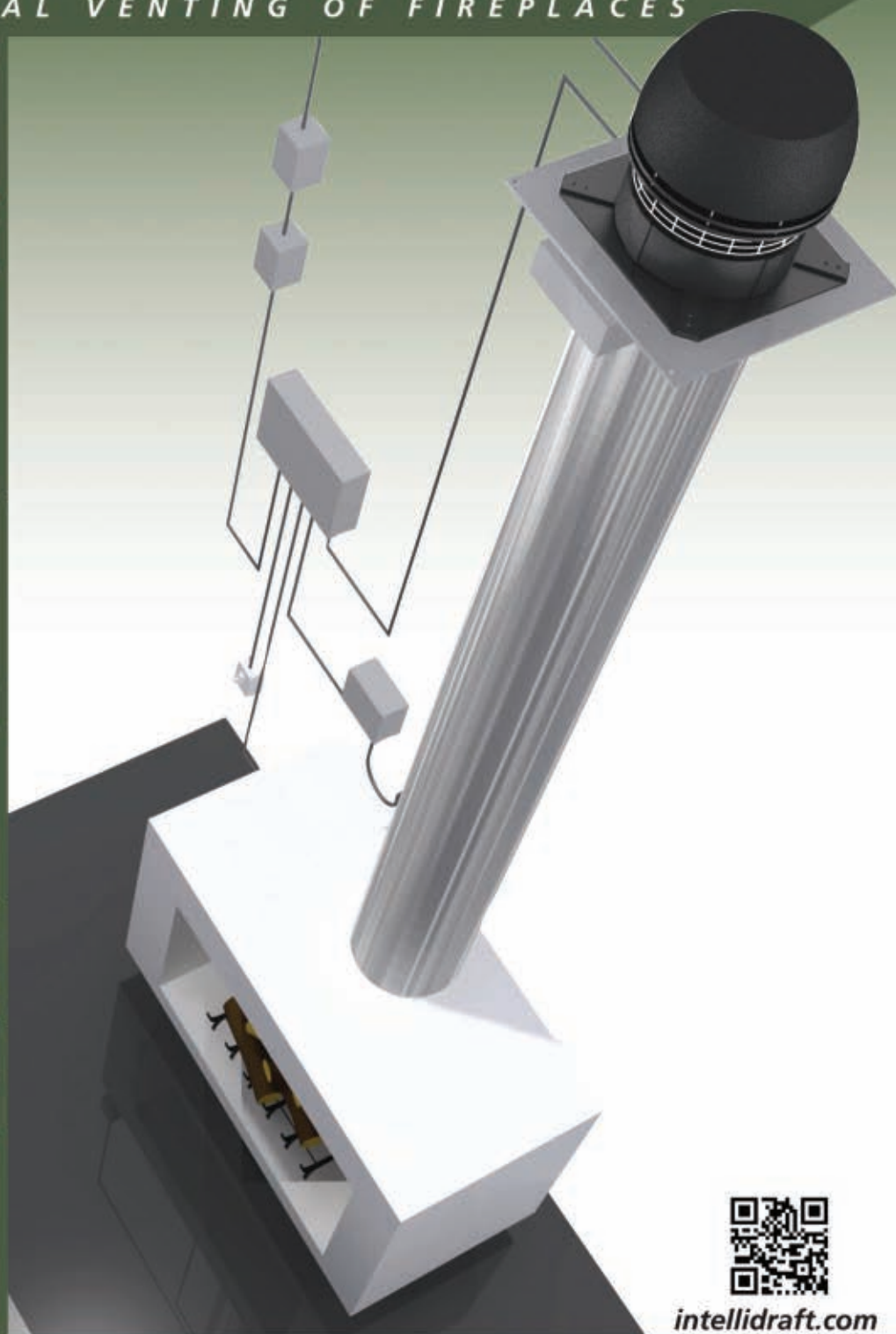
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# A BETTER BULKHEAD

By Rob Robillard

I recently installed a new powder-coated Bilco basement door. I first saw this new door finish at a builder's trade show in Orlando and then started seeing them pop up all over. When I had the opportunity to install one on my workshop entrance this past spring, I jumped on it.

## WHAT'S THE HYPE WITH THIS NEW BILCO DOOR?

Bilco is a well known brand in the building trades. The company has been making bulkhead doors, precast stairs and window wells that meet egress codes for years. The Bilco basement door system satisfies IRC 2012 Building code requirements for emergency egress in finished basement areas.

Egress is required in building codes and ensures that homes have plenty of exits, so that in the event of an emergency, people can get out quickly and easily. Building inspectors are very particular about ensuring that homes meet the egress standard, since failure to follow the egress code can be fatal in the case of a fire.

**NOTE:** As a general rule, every bedroom must have an outlet to the outside, which can be a window or door, through which someone can easily fit. When remodeling basements or adding bedrooms, contractors will often cut an exit in a foundation wall

How To  
Install A  
Basement  
Bulkhead  
Door System



## A BETTER BULKHEAD



*The old bulkhead door had deteriorated from weather exposure.*

*The bulkhead door provides weather protection and security to the basement while meeting egress requirements for the building code.*



and use a bulkhead as the external security/weather door, and then install an internal weather-stripped door to keep the heat in.

The new Bilco door is similar to the classic standard steel doors that Bilco has been making for years with one major difference: It has a factory applied powder-coat finish. Bilco offers four colors in

this finish; white, sandstone, light gray and brick.

### **WHY A POWDER-COAT FINISH?**

Powder coating is mainly done to metal and is a type of coating that is applied as a free-flowing, dry powder. This coating is typically applied electrostatically and is

then cured under heat to allow it to flow and form a “skin” over the metal. The result is a superior finish that is more durable and tougher than conventional paint. Powder-coated finishes typically are more resistant to chipping, scratching and fading—all things that can happen to painted steel basement doors.

By powder coating the doors Bilco is able to offer a better quality, environmentally safer product. Powder coating produces a thicker, more uniform and better-looking coating than conventional liquid



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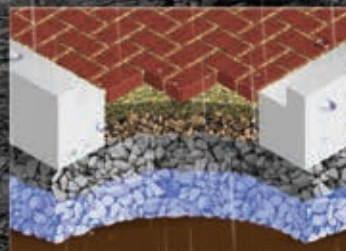
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## A BETTER BULKHEAD

paints. Powder coatings emit zero or near zero volatile organic compounds (VOC's), and the overspray can be recycled to achieve nearly 100 percent use of the coating.

### INSTALLING THE BULKHEAD

For my installation, I ordered the extension panel for the system to achieve the proper headroom

when exiting the basement. The new unit was replacing a 25-year-old unit. The pre-formed concrete stair foundation was in great shape, so all I needed to do was replace the cap.

**TIP:** If your situation requires concrete repair, then check out Bilco's website for help and advice. The company offers ideas on how to make the repairs needed, plus they sell "foundation plates" to help smooth and level the surface area for a better installation. It's the easiest and fastest way to improve the foundation surface area.

Prior to ordering I had to carefully measure my existing condition to see if the measurements fell within the parameters of the new powder-coated Bilco basement door unit. There is some leeway with the measurements, and the concrete pre-formed stair still fit the unit.



*Paint on the old door had badly chipped over the years. The new door's powder-coat finish will ensure a much more durable paint job.*



*Siding had to be removed to disassemble the old door.*

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The old fasteners were pulled out of the concrete foundation.



After the old door was removed, the old concrete foundation was found to be in good shape.

It is critical that the new door be installed on a surface that is smooth and level. When installed properly the Bilco door unit will open smoothly, close easily and keep out Mother Nature.

**TIP:** One of the reasons the old bulkhead failed was lack of gutters. I suggest you install gutters or a rain diverter above any basement door unit to protect the door as well as to keep water from getting under seams and into the basement below.

## FIRST IMPRESSION

The Bilco doors and panels arrived as a drop shipment from my lumberyard. The door came boxed up as heavy-duty metal panels. I was pleased to see how nice the powder-coated with a polyester resin finish looked. The polyester resin provides a durable, weather-resistant coating that exudes quality.

This powder-coat process also

eliminates the time and expense required to paint the door—a huge time and money saver. If only I could buy powder-coated cedar clapboards for my house!

## ASSEMBLY

**STEP 1:** Assemble the frame. This step was straightforward and easy to do using round-head nuts and bolts. It reminded me of an

### Tips for Installing Concrete Pier Footings

Here are some useful tips to ensure your footings are installed properly and the integrity of your project is maintained:

- You should always make sure that a qualified engineer has designed your footing forms and that they have been tested by an accredited organization.
- Select a footing form that can carry the weight of your new construction and has met the proper building codes.
- Select a footing form made of environmentally friendly, sturdy materials.
- Ensure you are placing the footing form on solid ground. The more solid the ground the less likely movement will occur.
- Install your footings 4-6 inches below the frost line to avoid potential movement. If you are in an area without frost, then the form should be back filled 2 feet to hold it in place when it is being filled with concrete.
- Should rebar be required pour concrete into the system first. Insert three or four number 4 or 5 rebar rods into the tube. To determine the length of rebar, measure the distance from the top of the tube to the air holes located on the Bigfoot Systems® Footing Form before you place the system in the excavation and backfill.
- Purchase the amount of concrete stated on the form label. You will use all of it.
- Use a Bigfoot Systems® Footing Form as a funnel to pour concrete into the system by placing an inverted Bigfoot on top of the construction tube.
- For a marine application, such as constructing a wharf, pour the concrete into the footing and tube on shore and have an excavator set them in place in the water. The other option will entail using a diver and pumper truck.
- Footing forms should always be used when installing footings as they provide added stability, strength and safety to your new construction.
- Don't risk having to redo the job, do it right the first time!

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# A BETTER BULKHEAD



*The door arrived as a package of metal panels to be assembled.*

Erector set. Bilco provides a detailed instruction manual with pictures to assist in every step.

**STEP 2:** Anchor the frame to house foundation. This was the fun part. I moved the door system as a complete unit into place and checked it for fit, leveling it in the process. Once I was happy with the fit, I measured the

door diagonals to "square the unit" and then used a marker to mark the anchor locations on the concrete foundation.

The instruction manual calls for a 3/16-in. hole and six 1/4-by-1-3/4-in. masonry screws, three on each side.

I chose to use Wedge Bolts where I was able to fit my impact

driver and then used expansion bolts where I could not fit my driver. My main reason is that I like to over-build and I wanted better "hurricane lift" protection than what I felt the masonry screws offered.

The extension panels have flanges that allow the unit to be attached to the house wall. I used this to install screws right to the wood framework of the house. After this unit was installed, I overlapped and covered these seams with Vycor rubber flashing and then overlapped them with cedar clapboard siding, caulking all of the seams.

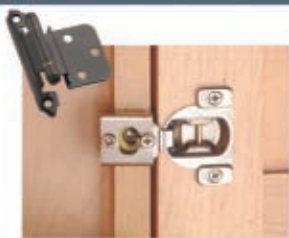
**STEP 3:** Door installation. The doors were heavy and solid.

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# A BETTER BULKHEAD

The extension panels were assembled with the included hardware and then fastened directly to the house framing and concrete foundation.



*Predrill the foundation for the masonry anchors.*

They have hinges that index into hinge receiver brackets and are secured in place with hinge pins—super easy and fast to install!

#### **STEP 4:** Gas spring installation.

To assist opening and closing, each door has a gas spring piston that prevents the doors from slamming and also assists in raising and lowering them. The pistons allow the operator to lift a normally heavy door with one hand.

At this point I could almost smell victory—a few simple nuts and bolts attach the spring piston which snaps into place onto the bracket.

**STEP 5:** Painting the door. If you purchased a powder-coated door, there is no need to paint the door. You're done!



*The door was assembled, checked for square and then moved onto the foundation as a single piece.*



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# A BETTER BULKHEAD

**STEP 6:** Rubber bumper installation. The last step is to install two rubber bumpers at the door's edge to protect the doors and the side wall frames.

## FINAL IMPRESSIONS OF THE BILCO BULKHEAD DOOR

The gas pistons really make these heavy doors easy to open

and close—a great feature for small children and the elderly. The locking slide bolt on the inside is easy to use and super secure. The strength and durability built into these doors also provides a real sense of home security. The doors close reasonably tightly and have overlapping flanges that keep out the weather and wind-driven rain. I will be adding the optional keyed lock to this door soon.



*Level the door carefully and fasten according to the instructions.*



*For extra holding power, the fasteners for this project were upgraded from the recommended concrete screws to wedge bolts and expansion bolts.*



*The flange of the door was sealed with rubber flashing.*

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*The gas spring pistons attach to brackets on the doors.*



*The pistons assist in easily opening and closing the heavy metal doors.*

The powder-coated Bilco basement door was very easy to install. I rate this a moderate level of difficulty for a DIY'er.

The powder-coat finish really makes these doors "pop" and will no doubt provide a weather-tight seal from the elements for years to come.

One thing I was not excited about was that Bilco does not use galvanized or stainless steel with their fasteners. A small investment to improve the quality fasteners will go a long way when enjoying your new bulkhead door.

After installing this door I would recommend a Bilco powder-coated

door as a basement access or egress without hesitation. The bulkhead doors are ideal for access to a basement and to allow you to move large storage items, hot

water tanks, furnaces, pool tables, furniture, etc. through the door. It's safe, secure and durable, and the finish is going to last a long time. **EHT**

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*A little preventive maintenance can go a long way.*



should inspect the electrical components and connections and repair/replace or tighten any components as required. They'll inspect pumps, lubricate and check flow rates where appropriate; clean and lubricate motors as required; examine belts, and adjust and align them as required. A professional HVAC tech will also inspect, clean and balance the blowers as required.

A service visit in the spring should entail cleaning inside the air conditioner coil, condensate pans, condensate traps, and condensate lines to prevent obstructions. The outside coil should be cleaned and fins straightened for efficient operation. The tech should check refrigerant levels and if low, find the leak and fix it. (According to many equipment manufacturers, a 10-percent refrigerant loss will result in a 20-percent decrease in system efficiency.)

HVAC service in the fall should include cleaning the furnace's burner assembly and removing soot from the fire side of the burner. The heat exchanger should also be inspected for cracks. A professional tech can adjust the air-to-fuel ratio of the burner and perform a combustion analysis.

Some professional service techs will suggest having your system inspected up to four times a year (of course, they're the folks that are selling the service). However, an annual inspection from a knowledgeable pro is a good investment by the homeowner.

Following are also some simple maintenance steps a DIY'er can take until time for the next pro inspection.

**M**ost homeowners have a rudimentary understanding of their heating and air-conditioning system but only get "up close and personal" with the equipment when a problem arises. And when a problem arises with the HVAC system, the house can get very hot or very cool very fast, which can elevate the inconvenience to an emergency.

However, like most other components of your home, a little preventive maintenance can help avert catastrophic failures in the future.

Since HVAC systems often mystify the homeowner, consulting a professional technician is typically a good idea. Pro technicians will check system functions, safety controls and adjust the operating sequence where appropriate. They





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## FILTERS & DUCTWORK

Be diligent about regularly replacing the filters that remove dust and other particulate impurities from the air as it circulates

through the HVAC system. Most systems use disposable filters. Some furnaces have an electrostatic filter, which is a sturdy metal filter that needs to be cleaned

every few months. In either case, a clogged filter hinders airflow, and your system will have to work harder to achieve the temperature programmed in your thermostat, which wastes both energy and money.

The ductwork in HVAC systems should be maintained as well. Some homeowners opt for having ducts professionally cleaned with high-pressure vacuum equipment. Duct-cleaning won't noticeably improve energy efficiency, but there may be other benefits such as the removal of dust, mold and other allergens.

Make certain that duct joints are sealed to get the most efficiency from your system. Avoid "duct" tape for air ducts and wrap the joints with high-quality foil-faced tape, which is more durable and creates a tighter seal. In warm climates, ducts that run through attics should be sealed very tightly.

Also, keep the area around the furnace clutter-free. Basements and utility rooms, which often house the furnace, tend to accumulate all sorts of junk and storage items, but a furnace needs

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*Shown is the Bearcat wood-burning furnace from Charmaster.*



## SAFETY TIPS FOR WOOD-BURNING FURNACES

Do you heat your home with a wood-burning furnace? The most important item to remember about operating and maintaining any brand of wood-burning furnace in your home is safety. You can never be too careful. Read your operator's manual for proper installation, operation and maintenance. Establish a routine for proper wood storage, maintenance of the furnace and safe firing techniques. Also, have a clearly understood plan to handle a chimney fire, should one occur.

The experts at Charmaster ([charmaster.com](http://charmaster.com)) offer the following monthly maintenance tips for your wood-burning furnace.

- Remove and clean creosote from stove pipes between the furnace and the chimney. Install new stove pipe as needed for safety.
- Clean creosote from the heat exchanger.
- Check and clean creosote in the chimney and chimney cap.
- Check and change furnace filters every 15 days. Dirty furnace filters will cause furnace overheating and unsafe furnace operating conditions. Handling wood creates dust, thus wood-burning furnaces require more filter changes per season than conventional oil or gas furnaces.
- Remove ashes as often as necessary.
- Disconnect the furnace power source, and then clean and inspect the blower assembly. Lubricate if necessary.

good airflow for proper operation. It's best to keep the area around the equipment clear of obstructions and especially combustible items.

## MAINTAINING THE FAN MOTOR

Many furnaces have factory-sealed bearings that never need oiling, but other motors do require occasional lubrication. Remove the access panel and examine the blower motor. If it needs oiling, then you'll find small holes at either end of the motor. Apply a couple of drops of oil (usually 10W/non-detergent) to lubricate the motor.

Not all fans run off a belt, but if it does then it may periodically require tightening. Check the tension by pushing down on the belt midway between the fan and the motor. The belt should flex about one inch. If it doesn't flex appropriately, then loosen the nut on the bracket that holds the motor. Turn the second nut to tighten or loosen the belt. Retighten the nuts

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*Use foil tape for an airtight seal around ductwork.*

once the belt has been properly tensioned. Cracked or stretched belts should be completely replaced.

A belt-driven fan motor will operate most quietly and efficiently when the pulleys are in line with each other. Place a straight edge, such as a level or ruler, against the sides of the pulleys on the

motor and the fan. Check for any deflection as evidenced by a triangular space between one of the pulleys and the straightedge, which indicates misalignment. To correct this, loosen the bolts

that hold the motor on the mounting bar. The bolts of the motor are held in slotted bolt holes. Slide the motor along the bar until the pulleys are aligned and retighten the fasteners. **EHT**

## SIMPLE TIPS FOR A WARMER HOME

### ADJUST YOUR FAN

It may seem counterintuitive to turn on your ceiling fan during the winter, but most ceiling fans have a switch that controls two settings. The counterclockwise setting cools the room during summer. However, since heat rises, during winter the fan's clockwise setting forces warm air downward into the living space.

### ADD MOISTURE

Anyone who's spent a steamy summer in Alabama will attest that humid air feels warmer than dry air. For a more comfortable sleep and to soothe sinuses irritated by cold, dry weather, use a humidifier. Both cool mist and warm mist humidifiers are available, but either can make a room feel warmer.

### SOLAR POWER

The radiant heat of the sun can be harnessed to heat your home by strategically adjusting your blinds and curtains. On sunny days, open curtains that face southward to let the sunlight in. However, close the curtains at night to provide an additional insulating barrier between cold outdoor air and your home.



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# Concrete Slab Basics



By Matt Weber

A concrete slab is one of the basic components of modern construction throughout the world. Whether used as a building foundation, sidewalk, patio or a mounting pad for your AC condenser, the method of construction is largely the same.

Building codes generally require that exterior stairways have a concrete footing or foundation. Without the foundation the steps will sink, heave or tilt to one side. This article shows how to build a 4-in. thick slab that will serve as a foundation for a set of deck steps.

Be prepared for a workout if

you're constructing a concrete slab. It can be tough work, requiring a lot of digging, mixing and other sorts of manual labor.

## STEP BY STEP

First, mark the perimeter of the slab location with stakes and string. Make sure the slab area is large enough to completely support the bottom of your stair stringers—or whatever else you plan to use it for.

Calculate the depth of the finished slab, including the concrete and the gravel base. Concrete is typically applied at a minimum of two inches, but I recommend a

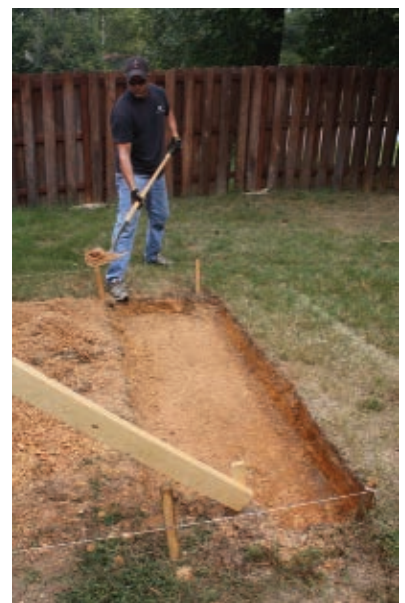
minimum thickness of 4 inches for a durable stair footing. With this type of application, both a fine and coarse aggregate are required. (I used ready-mix bags of Sakrete.)

Next, dig a level excavation to the dimensions of your slab, plus room for forming boards.

The first layer of my slab consisted of 5 inches of gravel. I shoveled in the stone and compacted this gravel bed down to 4 inches with a hand tamper.

Next, I built a rectangular concrete form using 2-by-4s fastened with some heavy-duty R4 screws from GRK Fasteners. Pros often use duplex nails to build the form, which are easy to pry out after the slab cures, but for a low-profile form like this I find using screws to be even faster. The forms frame the perimeter you marked with the stake and strings.

I leveled the form on the gravel bed and anchored it in place every 18 inches by screwing in stakes driven in the ground outside the



*First step is to excavate the slab location.*



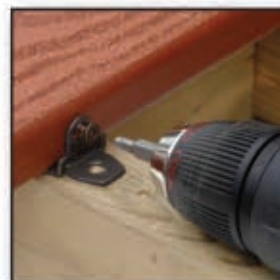
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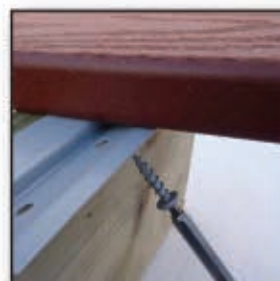
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## PROJECT NEXT

frame. The stakes hold the forms securely so they don't bow or blow out when filled with the heavy concrete. Once the stakes were in place, I cut them flush with the top of the form so I could use a

screed board once the concrete was added.

There was a slight grade in the soil I had to overcome to ensure that my stair landing was built level. To accommodate the slope I

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*Add a gravel base for the slab.*



*Tamp down and level the gravel bed.*

partially buried one end of the form below grade, leaving the top inch of the form above ground to shed water. The opposite end of the slab was set above grade, with the edge of the form exposed. Removing the soil allowed me to level the form from left to right and front to back, and stake it securely. Be sure the form is flat enough to provide an even landing for the stair stringers but slightly sloped to shed water away from the home.



## CURING

Concrete doesn't achieve its strength from drying, but from curing, which is a chemical reaction. According to the experts at Sakrete, "Curing is the action taken to maintain moisture and temperature conditions in freshly placed cement mixes, allowing the cement to thoroughly hydrate." This can be done by misting the concrete, placing wet covers such as burlap on the concrete, or by coating with a product such as Sakrete's Cure n Seal.

Curing is necessary for the concrete to achieve all of the desired properties. Additionally, rapid loss of water from the surface of the concrete will cause the slab to cure at an uneven rate. This can happen during periods of high temperature or wind. If the top portion of the slab dries before the lower portion, the concrete will cure at different rates, causing the slab to develop cracks. Learn more at [www.sakrete.com](http://www.sakrete.com).



*Dig deep enough to account for the gravel base (4" after compaction) and concrete pour (4").*



*The concrete form was made from treated 2x4s.*

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## PROJECT NEXT

I then laid a grid of rebar on wire brackets that float the rebar about midway deep in the concrete forms. I tied the rebar intersections with wire.



*I used a cutoff saw to trim the rebar to size for the reinforcement grid.*



*Secure the rebar grid with wire ties.*



*Stake down the form every 12 to 18".*

mixed up some quick-drying concrete, one bucket at a time, and filled my form. It took longer than expected, and next time I'll rent a concrete mixer.

You should spray down the form and the gravel with water when adding the concrete. Keep the entire work area damp throughout the installation of the concrete so the surroundings won't leach moisture out of the concrete before it has properly cured.

When the mix reached the top of the forms, I struck off the excess concrete even with the top of the forms by screeding it with a very straight 2-by-4. It helps to move the edge of the screed board in a side-to-side motion over the upper edge of the form to create an even slab.

I then used a wood float in a circular motion to work the heavy aggregate below the concrete surface and bring the "cream" to the top. If you prefer, you can roughen the surface with a broom as the concrete cures to give more traction to the top of the slab.

Allow the concrete to cure for a few days before walking or building on top of it. Because I was building during the heat of summer, I kept the slab covered in plastic to retain moisture for a slow, solid cure. **EHT**



*Apply the concrete. I mixed it one bag at a time but should've rented a mixer.*



*Screed the concrete even with the form.*



*Float the surface of the slab to bring the cream to the top.*



*After the concrete fully cures, it's ready for use as a walkway or footing.*





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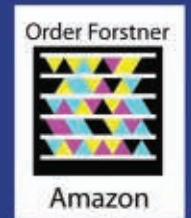
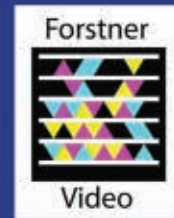
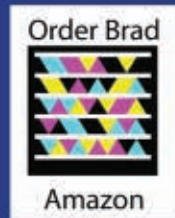


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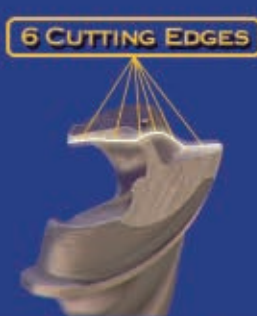
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