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TOH crew members position physical shoring on one of the Manchester project's five new dormers. For more info on this and a lot more work, see "Peak Performance," page 73. BY JEFFREY KELLER

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cover

At the TV show's Manchester project house, TOH On-Scene general contractor Tim Silva shows that a new dormer window is planned. Inspired by village houses of the 17th and 18th centuries, Silva built a dormer that blends in with the original. To find out how Tim and the crew got the job done, see "Peak Performance," p. 73. PHOTOGRAPHS BY KELLER & KELLER

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departments

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In "Vintage Finds" (p. 20), **BO NILES** recounts the adventures of a sprawling postcolonial kitchen in Maine. "The homeowner did a beautiful job of preserving the room's historic character while improving its efficiency," she says. On a different note, Niles is currently remodeling her own "messy" kitchen in Madison, and she's been collecting ideas while working on this and several other recent Maine folk projects. A former senior editor at *The Old House and Country Living*, Niles has won 11 book-of-the-month and other design awards.

CHRIS PYLE illustrated the month's Persons column ("Fix-Up Funds," p. 56) as construction and insurance boss. He and his wife recently took over just such a job to subdivide the garage on their 1920s home in Indianapolis, and the financing on his had them to add a new art studio above before settling down to a drafting desk. Pyle, who's been in the industry for years as a rock and jazz drummer. His educational illustrations have appeared in numerous national publications, including *Time*, *National Geographic*, and the *New York Times*.



"Having spent so much time on construction and design, I've learned that houses get built at all," says writer **DAVID REICHGOLD WARD**. "There are so many middlemen, coordinators, and everything has to go down in a certain order." While covering the magazine's *Timeless Home* project ("A.S. Dreams Go," p. 92), she's also been supervising the building of her own new home, designed by her uncle, 1927 architect, Bruce, at the same Atlanta neighborhood. The secret to success, she has learned, is plan well ahead—"a pretty good lesson for me, too."

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All the Right Moves

My wife and I found it very interesting to read other people's experiences and speculate on moving houses in "Middle House" (September 2001). We recently moved a two-story farmhouse built about 1910, to a new location over 10 miles away! When they first heard of our plan, many people expressed concern for our sanity, but once they sat back and saw the size of the house, its structural integrity and its potential, they no longer questioned our motives. I cannot say enough good things about our move, who transported the house with great care.

Moving a house is a tremendous adventure, and it can be an interesting and exciting process—sometimes frustrating, but always full of lessons.

WILLIAM KEITH PEAR, LEXINGTON, MISSOURI

I've always wondered how houses are moved. It's such an interesting process. I first heard of it when a friend brought a barn in New Jersey, dismantled it, and had it moved to Maine. He passed both the old and the new houses inexpensively, and now he has exactly what he wanted where he wanted it. It's a fantastic idea, especially to move a historic home that would otherwise be lost—there's no loss but more people don't try it.

MIKE FLORESCHI, NEW YORK, N.Y.

We agree that moving a structure is an often overlooked and viable option for those who are interested in a historical home but perhaps don't like its size. Our monthly issue *Viva Old House* column features many opportunities to purchase a house, sometimes for as little as \$2, that can be moved to a location of the homeowner's choosing.

A Soft Place Is Hard to Find

Your September 2001 issue noted on the cover "Soft Flooring for Kitchens," but I couldn't find anything viable about soft flooring. Can you give more information about the flooring options and costs and where to find it? Mike Weiss, Boca Raton, FL

You're not the only reader who had trouble tracking down the "Move Notebook" in September's *House Calls with Sheri*, page 22. (Further information can be found in that issue's *Discovery* page 146.) Given the stress expressed, we are planning to run a



PHOTO: JACQUES NOB

Feature in a spring issue that will feature many different materials and price ranges, as well as installation information.

Le Fig Threesome

Scott Gibson had an excellent article on weatherstripping (October 2001), but his "Night-Move Risk" (right) works only for homeowners with tight-banded thresholds. These account for about 10 percent of renovated homes, but not all. Turnbuckles, high-speed pumps, compressors, and other installing equipment, especially where vibrations occur, generally use left-handed threads on the ends of clonk-like rotating shafts to prevent the nut from loosening and coming off.

You have a very good magazine that I look forward to reading each month.

EDWARD B. WILSON, PORT HAVEN, TEX.

Hydraulic Help

The advice given in "Hot Water-Heating Green South" (Jack Horn, October 2001) was off the mark. A properly installed hydronic or steam system is infinitely more comfortable than a "hardwood-air" furnace. You might have



referred the letter-writer to a site like www.bearingshop.com, which has a "Find a Contractor" feature that a homeowner can use to find a local hydraulic-system contractor. PHILIP WILSON, BIRMINGHAM, MISS.

Stone Washed

Regarding the advice given in "Gooty Stone," Ash Horn (September 2001): Years ago we bought a house that had a Tennessee stone fireplace that had turned black and orange from the previous owner's smoking habit. We, too, were advised to use sodium phosphate (TSP), but when I read the directions and realized that this is a caustic substance that must

be treated with respect, I decided to search for another solution. I found that scrubbing a non-bleach, nonabrasive spray cleanser onto the stone using a bristle brush and then letting the surface with a clean sponge worked perfectly. Love the magazine, love the slow-down, hope this is helpful!

GAELA BELLIS, CUMMIS, N.J.

The success of the treatment used depends both on the type of stone and the source of the stain, so you found, testing on a small area first may reveal that a milder cleanser than TSP will suffice satisfactorily.

punch list

editorial note: what is going on here is according to the standard one construction job.

• In "Endicott" (September 2001), the photo of the Massachusetts house (which is still a very good one) is a work of art.

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Higher Ground

When TON general contractor Tom Siles needs to reach greater heights on the exterior of the TV show's Manchester project, he goes himself: a lift with two different types of staging systems: aluminum poles with an adjustable platform (above left), or standard steel scaffolding (above right).

If Tom works on a short-term task that doesn't take a lot of extra hands but does require him to move around a fair amount—fixing a door or window opening, for example—he uses the lightweight aluminum system, which allows him to change the platform height with a hand crank. “It uses no inch, or three feet, or twenty,” Tom says. “I just jack it up to a comfortable working level.” With two 24-foot poles that

attach to the house, a 20-inch-wide work platform, a workbench platform, and ladders to reach attic nooks, the staging can be taken apart and used in less than an hour.

The sturdier, 6-foot-wide platform of freestanding steel scaffolding better suits jobs requiring heavy materials and multiple workers—such as construction of the McCue second-story deck. In fact, the back of the Manchester house was covered with the lightweight staging for a full five months while Tom and his crew removed and rebuilt most of the house's skin on that side. “I can bring up lumber, windows, bricks, even build a workstation on my platform,” says Tom. “It’s like lifting the ground up and leveling it with the roof line.”

PHOTOGRAPHS BY DAVID GARMER

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Tom's Technique: subflooring

FOW contractor Tom Silva's tips on building a base for a strong, stable floor

The Manchester project overhaul includes the repair of several floors, so Tom Silva's been ripping out a lot of board subflooring to get to the sagging joists (see "Frame Work," November 2006). Once he finishes bolting them, he'll install new plywood subflooring. Here are his step-by-step instructions for a sturdy, squeak-free base.



1 Use only 4-by-8-foot sheets of 5/8-inch tongue-and-groove plywood. Places of 1/8 inch inside finger joints; the finger joints are the most secure the floor. The interlocking joints are stronger, and the thick boards are less susceptible to splitting between joints.

2 Run the long side of the plywood—and its grain—perpendicular to the joists. "Then it won't sag between them," says Tom.

3 Stagger the joints like a mosaic floor when laying blocks.

4 Otherwise you're putting more stress on one joint than you need to," he says. "And that weakens the floor forever."

5 Lay out each single with head of subfloor down the middle of each joint, a thin bead on the tongue end of the plywood, and only enough for you to work with one sheet at a time (1). "Ways over

every joint at once, the glue will form a skin before you can get all the plywood sheets, and it won't stick," he says.

6 Leave a 3-inch gap (the width of a 2x4 stud) between shutting square edges (2) and about half that—first symbol the space—between each tongue and groove. "Wood expands and contracts every minute of the day," says Tom. "Loose joints prevent buckling or fracturing squares."

7 Finally, drive 6d ring-shank nails from a nail gun or 7½-to 9-inch deck screws through the stud so they just dip into the new base without breaking through it (3). "A nail sunk two-thirds of the way through the sheet is only 3/4-inch if we cut left underneath the head," says Tom. "That's a weak board, and ultimately a weak floor system."

When architect Stephen Holt and homeowners David and Janet McClure decided, mid-renovation, to expand the square footage of the new kitchen at the Manchester project—the son of design relaxation that takes place on every job—Tom Silva realized that one very important steel beam would come up short by more than 2 feet. The beam had been installed during the house's 1979 renovation, but the new configuration moved the wall that held up one of its ends 26 inches farther out. No problem, said an ever-willing Tom; we'll just tack on a new piece of steel to the beam using a

"frakbee." This joint, in which one I-beam is patched to another with a sort of tub-and-slot assembly, is considered by steel workers to be particularly sturdy. "There's more surface area in the weld than in a conventional end-to-end joint," says Tom. "And the longer the weld, the stronger the joint."

Tom used a coffin cut to trace a 3-inch-diameter half-circle "bee" on the vertical surface at the end of the beam in place and then drew a tab of equal size on the addition (see illustration, left). Using an acetylene torch, Bob Duono of Boston Welding and Design cut away the semicircular hump on the longer beam and the steel surrounding the tab on the add-on; then he fit the sections together and welded them into a single, unbreakable repair. Says a satisfied Tom: "The welded joint is actually stronger than any other part of the beam." —Jefferson Miller

Extension School

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HOUSE CALLS WITH STEVE



Yankee Pride

A respectful radio improves what was best about a one-time tavern kitchen

BY BO NILES

As a child, John Henshaw spent many joyful summers at his grandparents' house in Brunswick, Maine. Built in 1789 as a roadside tavern, the classic four square—so called for its square plan with a room in each corner—had been in his family ever since his grandfather purchased it as a vacation home back in 1944. Now the house, along with an boyfriend's mansion and a quarter mile of shoreline, belongs to John, who took possession of the place after his grandfather's death in 1998.

Although some modest improvements had been made to the house in the 1970s, the water wiring just in had taken their toll. John, a software entrepreneur who works with a microcomputer company in nearby South Portland, had to upgrade the entire infrastructure: "The hot-water heating, electrical, plumbing, basement floor, and septic are all new," he says. Despite all the work, he wanted the house to retain its historic appearance. So when it came to the rambunctious kitchen and its hodgepodge of dishes and aging appliances, John, an accomplished cook, was intent on preserving the open, friendly feel of the 16 by 22-foot room. He also wanted to include an informal eating area where he could entertain family and friends casually.

PROBLEM

While the kitchen was generous in size, precious wall space was hidden up by two staircases—one leading to the bedroom above and another to a cellar below—as well as four doors leading on to a mudroom, a bathroom, the dining room, and the living room. Such a layout might have been useful in the house's earlier days, but "giving over that much real estate to one room



more. Although his grandparents' kitchen was cheerful, John wanted to preserve the room's quaint, open atmosphere. With only minor changes to the layout, the new plan created a work area for a serious cook.

PHOTOGRAPHS BY SEAN BURDANE



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HOUSE CALLS WITH STEVE

doesn't make sense in a modern kitchen," says *The Old House* host and past-time Master restorer Steve Thomas. All of these interlopers were moved (and John's grandparents had to push their refrigerators against a window, and they had very little storage space). Kitchen areas were rearranged to wrap free horizontal surface, including windowsills, the top of the hodge, and even stairway treads.



IDEAS: The 16-by-22-inch kitchen area means that inefficient because much of the wall space was interrupted by chimneys and stairways. **STYLING:** Pulling surface of the chimney and walling up a doorway created 32 square feet of wall and storage space. And connecting the adjacent pantry and mudroom made way for an easy breakfast room.

SOLUTION

John relied on his preservationist instincts to create a new kitchen and dining area. Then altered the design of the bathroom home as little as possible while addressing roommates and improving storage space. To expedite the redo, he called on general contractor Don Clifford of Harpersville, Maine. As John says, Clifford maintained the look, but he did not off the back wall, replacing it with an enclosed

(which had weather control) and two a new L-shaped counter, with a dark-green laminate top, around the corner to connect the appliances. This arrangement added John 9 square feet of workspace, with a sink and dishwasher on one side and a gas stove replacing the old electric range on the other. With four basins, grill, and griddle, the professional-caliber range is John's pride and joy. "I love getting all year round," he says. The diet list is meat, most food runs through a self-stirred wash, and most food runs through the range.

After much deliberation, John pulled out the staircase landing from the kitchen to the second floor. Its removal made room for a 36-inch-wide cupboard angled into the corner that houses the refrigerator and a TV above. "This was one of the smartest things I did," he says. "The space where the staircase ended upstairs turned out to be the perfect location for a laundry."

With instant as his guide, John had all of the coloring, including a new finish of concrete across from the sink, custom cast-iron frame pine with Shaker-style panel doors. He then painted them in the same dove shades of yellow he had used on the stairs since he was a child. Finally, he lightly sanded and repainted the old pine floor and wainscoting.

FINISHING TOUCHES

Adding to the old main bed in the 26-by-36-inch, French-style oak work as a space from. Made of stone, a traditional mantel quite common to vintage homes, it was hand built by Al Lindsey of Mad Cave Marble and Granite, in West Bath, Maine.

The 26-by-36-inch worktable at the corner of the room usually is for an island. John and a friend constructed the top and apron from oak and oak the top is hand-carved maple butcherblock. John also replaced the cast-iron woodburning stove with a simpler soapstone model more in keeping with the clean lines of the room.

Now that he's settled in, John is happy with the changes. Says Steve: "Not only is it an ideal space to work and dine in, it, but it doesn't seem dramatically different from his grandparents' kitchen." ■



LEFT: The stairs and breakfast area, opening full-height in the middle, allows light into the food prep zone. **RIGHT:** A computer workstation runs on a clear bench that echoes the clock.

new wall. Strained to blend in with the rest of the rest exterior, it contains a window that frames the rural scene and an 8-foot-high, multi-paneled back door, with transoms and sidelights. The space in the pantry can now be used as a new, saving eating area with a 16-foot-high cathedral ceiling, additional storage, and a window seat. "With his sense of preservation, John did only what was necessary to benefit the house without harming its character," Steve says. "The old-on look as if it had been there all the time."

John didn't even touch the simple, old-fashioned kitchen layout either Clifford walked in the kitchen-side door to the bathroom



Refrigerator Dec. 28 '90

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ASK NORM

Sound advice on woodstoves, peeling wallpaper, and tile mosaics

LIGHTS, ACTION...NO TV

I recently located 30-year-old incandescent lamps under my kitchen cabinets. They are old, aged, but they really mean up the reception on my TV and AM radio. I tried plugging the 110-volt cords into a different circuit, but that didn't help. We like the lights, but not so much that we'll sacrifice our entertainment. Got any ideas?

PAUL ANASTAS, GERMANTOWN, N.Y.

Like many modern electrical devices, halogen under-cabinet lights operate at considerably lower voltages—12 volts, typically—than the 110-volt power that feeds outlets in U.S. households. Incoming electricity is routed through a transformer, the little black cube you plug into an outlet, which “steps down,” or reduces, the voltage. But it also generates electromagnetic interference (EMI) that can wreak havoc with TV and radio reception. Other than increasing the distance between the transformer and your radio and TV, there's nothing you can do to make your existing transformer better behaved, short of turning off the lights.

With so much household gear relying on low-voltage power these days—including cordless phones, color-set printers, and cordless power tools—EMI has become a big problem, and you're not the only one complaining about it. Some more expensive devices come equipped with radio-frequency interference suppressors, which can alleviate EMI. Because EMI is technically a radio wave, it falls under the purview of the Federal Communications Commission. The FCC suggests that if you are having interference problems between fixtures in your house, you can try contacting the manufacturer of the area where the equipment was purchased to resolve the problem.

WOODSTOVE POSITION

We are building a new main entry on an existing slab, and will soon be ready to build a woodstove, which has a Sierra cladding on Princeton logs. Some friends say we should position the unit on an adjacent entryway. Does that seem right to you?

PAUL AND PATRICIA JONES, WORTHEN, ILL.

There's no reason your stove can't sit right on the slab—concrete isn't combustible. And because a woodstove heats primarily by radiation, it doesn't need extra height to keep you toasty. The only advantages of clearing a stove are that it would be easier on load and, with the doors open, would give you an eye level view of the fire when you're seated.



More important than a stove's height is its distance from a combustible wall. New stoves have an Underwriters Laboratories (UL) label that lists approved clearance from back and sides. If the stove isn't labeled, then follow the guidelines specified in your local codes.

CUSTOM MOSAIC WITHOUT KNEE PAIN

I want to create a 30-inch-diameter mosaic medallion for the center of a bathroom floor, then surround it with tile. But I don't want to spend hours on my knees working directly on the floor to draw another way to do this?

OSCAR WHEELER, GAITHERSBURG, MD.

According to tile contractor Joe Perinetti, who has worked on lots of TCN jobs, the easiest method would be to cut a piece of mosaic backer board 2 inches wider than the size you need, set it as a flat surface at a comfortable working height, then mount the mosaic pieces on it with rhinoceros adhesive. Leave out five pieces of the medallion—one near the center and one at each corner—so that when you're finished you can screw the backer board to the floor. Also, be sure to leave a 3-inch margin of bare backer board around the mosaic. That way, you'll be able to sand the joint between the mosaic's backer board and the tile substrate on the rest of the floor with 2-inch wide floor glass mesh tape and a clean coat of sealer.

GARAGE CONVERSION

We need extra room in our house but we don't want to build an addition. Instead, we'd like to convert our 10-by-21-foot garage into living space. The garage ceiling is 11 feet above the concrete slab floor, which is 3 feet below the floor in the rest of the house. We'd like to make all the floors the same height. What's the best way to handle this?

JOHN MCGOWAN, BIRMINGHAM, N.Y.

Building codes generally require at least 7 feet of headroom from the top of the finish floor to the lowest surface of the ceiling, so you won't have any problems on that front. They also require that all “habitable” rooms have a minimum area of window glazing—typically 8 percent of the floor area—to provide adequate levels of natural light and ventilation. (For the specific code requirements in your town, check with your local building department.)

The area under the new floor will be like a crawl space, so you'll need to ventilate it. Building codes require approved mechanical ventilation or cross-ventilating openings at the exterior foundation.

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ASK NORM

area walls on at least two opposite sides, located as close to the corners as practical. You'll also have to provide an access opening that's at least 15 by 24 inches so you can get under the floor panels easily to examine the area and troubleshoot any problems. Finally, some towns have regulations that require careful parking for every house, if you eliminate your existing garage, you may have to build a new one, at least a carport.

The construction part of the project is pretty straightforward. After you get a building permit, you'll have to frame in the garage door opening and then add the area to match the house. If you're adding windows, this would be the usual place to do it. To build the sound floor, use some lumber or joists to span the width of the garage. Support their ends with post hangers and horizontal ledger boards bolted to the wall studs. You'll also need to add fire blocking between the studs at the level of the new floor. Then insulate and wire as usual.

WALL OUTLET

A wall outlet at my house has stopped working. Can you give me some ideas about why this would happen?

Dever, Colo., Susan, 50 yrs.

Assuming you've already checked the circuit breaker or fuse box—it's not passing how many folks don't—it could be that the actual connectors inside your outlets are loose or not making contact with a plug's prongs. Or maybe a wire has come loose at the receptacle; the device that connects the wires. Electrician Allen Goffert says that most "dead" outlets he encounters are the result of "backstabbing" (see photo, top right), what electricians call the method of sticking stripped wire into the little holes in the back of a receptacle. Goffert admits that it's a fast and code-approved way to wire, but he never does that because the frayed inside the quick-grab that grip the wire can eventually allow the wire to pop loose. Instead, he always forces a wire loop, holds it around the terminal screw, and then tightens it. Goffert says that any receptacle old

enough for backstabbed wires to work loose ought as well be replaced. It's an easy task, as long as you always shut down the power at the circuit-breaker panel first, and always verify with a voltage tester that power is not reaching where you're working. Also, you have to be sure the new receptacle matches the type of wire in your house. Most homes have copper, but those with aluminum wiring, recognizable by its silvery color, need to have receptacles marked



"CofN" (see photo above). If you use a receptacle marked for copper wire, the decorative details will corrode and you'll be left with flaky connections, possible sparking, and the potential for a fire.

PEELING WALLPAPER ON A CEMENT

We live in a 130-year-old house that has a fireplace in the livingroom and a chimney that runs up the middle of the house. The sootbox at the chimney alongside the upstairs bathroom has been plastered and wallpapered, but we can't



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ASK NORM

owen to keep the paper stuck to this part of the wall is because of the temperature change in the chimney? **POWER HOUSES/BAKERS, N.Y.**

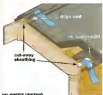
I think it's more likely a moisture problem. Smoke, being a porous material, will readily absorb water, which eventually migrates to the outside surface of the chimney. So you should first make sure that there's a cap on the chimney to keep out rain and that all the flashing is in place where the chimney penetrates the roof (see Ask Norm, June 2001, page 34). Also, if you have a high-efficiency gas heating system exhausting into an unlined chimney, the brim will soak up the water vapor generated by gas flames. (To correct this problem, use an AL 234-C stainless steel flue liner, and have the work done immediately.)

Painting and decorating contractors (John Drexler, who has worked on many *This Old House* projects, can't imagine the chimney getting hot enough to burn the wallpaper. "People paper behind stone and stone is all the time," he says, "and rarely have a problem, unless they don't use enough paint."

VENTILATING WITHOUT SUPPLIES

I own a "two-story Cape in northwest Ohio, where the winters are cold and snowy and the summers hot and humid. The second floor is now one large room with knee-wall windows. Its ceilings and gables walls have much-needed insulation, but the roof is not adequately ventilated because there's no overhang to install soffit vents. The furnace isn't vented either. I'm planning to install, but I don't know how to proceed. **THE GOSWOLDS, GERMEN, OHIO**

You're right to focus on ventilation. Having a vent installed at the ridge and on both eaves, and a clear pathway for air to flow along the underside of the sheathing, will prevent the buildup of heat and



NO-SOFT VENTING

moisture that would otherwise seal you from the life of your roof. The fact that your house has no soffits isn't much of a problem because your installer can put in a metal drip-edge vent that functions like a membrane soffit and lets air under the eaves bays. **W.V.**



probably have to trim off a bit at the lower edge of the roof sheathing, then create a gap for air to flow up to the ridge vent.

To install the ridge vent, the steps of roof sheathing will have to be cut off both sides of the ridge along its entire length, opening a 3-inch-wide channel for air to exit. I'd go with baffled vents here

ASK NORM

no snap windblown rain and snow from getting in. The same drip-edge-and-ridge-vent system will also work on the dormer roof.

If your roof doesn't already have a continuous overhang on gap between the eaves and the sheathing, you'll need to remove the roof wood and staple some foam baffles to the underside of the sheathing. When you install or replace the bays of insulation, just keep their vapor barriers facing inside and make sure that the baffles aren't flattened by compressing the insulation where your knee walls meet the rafters.

By the way, since you're replacing the roofing, I'd recommend that you stop a down to do the sheathing, even if the building code allows you to add wooden lath. There you'll be able to repair any sheathing damage, replace all the flashing, and really lengthen the life of your roof. **A**

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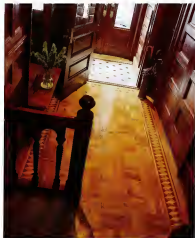
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Fancy Cuts

Laser saws revive the ancient craft of inlaid flooring



In this house and for its July 1941 *Movie* *Amnesia*, the inlaid floor was made by *Amnesia* (see page 10). The original floor was made by *Amnesia* (see page 10). The original floor was made by *Amnesia* (see page 10).

Their mission producer Tim Brame and his wife, the actress Judith Ivey, are serious about old stuff. When pure wear out on one of their vintage cars (including her 1941 Dodge pickup), they seek out genuine replacements. And when they found remnants of an inlaid floor design during the renovation of their 1992 Manhattan brownstone, they decided to re-create it. "We went for an exact reproduction," says Tim.

The only—a geometric border of alternating white oak and maple with a mahogany background—pattern was in the home's entrance foyer. The pattern leads movement and depth to the small space, and ties the rest of the white oak parquet floor into the original mahogany wall paneling.

Inlaid wood floors have been a part of interior finishes since Roman times, but in the last decade they have surged in popularity because of the development of the laser saw. With the help of AutoCAD design software, these 12-by-5-foot "saws," which look like oversized copy machines, can translate a designer's sketch into a custom pattern with the push of a few buttons. Once the pattern is downloaded, a laser starts

perfect cuts through as much as 175 inches of wood per minute, depending on the hardness of the species. "It's the most sophisticated woodworking tool in the world," says Jim Garth, co-owner of Descriptive Flooring, in Marietta, Georgia. The technology is so specialized that only a handful of American companies perform the work, using equipment costing as much as \$1.5 million.

But the investment has paid off. Garth says he and his competitors have seen business grow at 35 to 40 percent annually for the past five years because the effectiveness of hand labor has



"I don't want this
to happen to
my home movies."



SEARCH



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RECORD



EDIT



PLAY

made solid wood is affordable again for just about anyone budgeting wood floors in a new or renovated house. Hardwood can add less 40-inch boards for about \$300 for an average-size room, according to Garth, while a decorative border comes from \$20 per foot for a basic design to \$100 per foot for an intricate pattern. A standard 24-inch-deep computer workstation gets for \$500. Installation by local wood floor specialists in existing or new floors runs from \$3 to \$7 per linear foot for borders, midfloor transitions typically start at \$175.

The easiest way to plan an added wood floor is to choose from the classic patterns and motifs featured in top floor manufacturers' catalog. The brochure for Scam Quality Wood Floors in Menasha



Wis (who installed the inlay in Tim and Judith's bedroom) offers a variety of exotic woods and patterns, while Decorative Floorcraft stock but features 14 classic-black styles, including a Victorian rose pattern and a geometric Art Deco theme. "It's less expensive to use something that the manufacturer has his CAD designed up for," says Moore designer Der Molenet, who has worked extensively with wood inlays. "We try to go with as many standard designs as possible, and then make adjustments."

Of course, it's still possible to create a custom added wood floor entirely by hand. Eugene Klotz, owner of Renaissance Hardwood, in San Francisco, uses a scroll saw to cut intricate custom designs. "We're using a technique that hasn't changed much in five hundred years," says Klotz, who learned the craft at his uncle's place. "The only difference is that we rely on electricity, while they used hand power." To ensure that the pattern and its surrounding floor fit together perfectly, Klotz affixes two pieces of 1/2-inch wood bearing one on top of the other with a glue-on piece of wood will be inlay while the other will be the floor area of the design and pushes both pieces of wood through the scroll saw while the saw. He then dips the pieces into lacquer then sets to get them again. When semi-dry, the pattern is changing by imperceptible. "Computers can't duplicate the tiny little differences that a human eye will always tend to make," says Klotz. Hand-cut designs cost from 20 to 30 percent more than laser jobs.

Along with choosing the pattern, homeowners must also decide on the wood species. Of the 30 varieties Decorative Floorcraft offers,

some are familiar floor choices like maple and white oak while others are exotic exotics like South American purple heart and African leopard wood. (The company says it only buys wood from sustainable forestry programs.)

Once the pattern and wood type have been chosen, Garth enters the data into his computer, and ScanCAD software creates a scale drawing of the floor design so the homeowner can visualize the room before the wood is sawed out. Then he enters the specifications into another software program that delivers what's known as a tool path—a series of computerized commands that will guide the laser.

On one job, shop foreman James McVey places a sheet of 1/2-inch maple, 3 feet long by 1 foot wide (rough and wide) over scumming

no wood species, inside the "saw" on its vacuum table. An suction grips the wood and holds it perfectly flat. Then a 2,500-watt laser, which is mounted on an overhead arm and looks like the clutch end of a drill bit, goes about an inch above the surface of the table, steadily burning through the wood and cutting out a piece for the design; the accuracy is within 1/1000th of an inch.

Once all the pieces have been cut, McVey meticulously fits the inlay together. Because the pieces fit so tight, he glues them permanently into a 3/4-inch-thick birch plywood

substrate. "The plywood allows the inlay to be flush with the surrounding flooring," says Garth.

On the job site, strips go down the same way as standard wood strip flooring. To fit into edge cuts, grooves joints are milled into the sides of boards before leaving the shop; they go sealed in or glued directly on existing subfloors.

Medallions and other decorative details are a bit trickier because they involve routing out an opening from the surrounding strip flooring, which must be installed first. The key tool is a router template (supplied by the inlay manufacturer) that is held under (if the floor is a finished) or taped onto (if not). Once this is done, the router runs a plunge to cut with a top-bearing block cut be around the inside edge of the template and the inlay is composed. Then he chisels and cleans out the inside. "It takes about an hour to cut a hole for a medallion," says Garth.

For the final touches, Garth recommends water-based finishes, which are nontoxic and fast drying. When that's done, you can move the neighbor over to admire—and walk on—your new masterpiece. ■

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Silencing the Staircase

Tom Silva tightens up treads and banister

BY ZACHARY GAULKIN

G

etting the novel post, The Old Home general contractor Tom Silva pulls himself up the main staircase on the TV show's Manhattan project, where he takes over the sound of creaking wood. "That's exactly what not to do," he says. "Every time you yank the post, you weaken the whole assembly."

It's hard to resist pulling on a banister to propel yourself up the stairs or pounding on the treads during a rushed descent. But this type of abuse takes its toll. Wobbly newels, loose railings, rickety balusters, and grooving treads result. New staircases and old can be similarly affected as wood swells and shrinks with changes in humidity, loosening the grip of once-tight nails and screws.

A loose newel post requires a pro's attention, but a homeowner can easily tighten a railing or a squeaky tread—a matter of retightening the failed joints with finish nails or screws and then covering those tracks with putty or wood plugs. Tom cautions that his repairs last by choosing the right fasteners, drilling pilot holes, driving the nails at an angle—and not abusing the staircase. "After spending hours fixing them," he says, "you'll be sure to treat them lightly."

PHOTOGRAPHS BY BEN STECHER/ULTE.

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TIGHTENING A LOOSE THREAD

1. "When a thread squeaks, you're probably hearing the squeal of loose wood rubbing against a rail or another piece of wood," Tom says. Look for an often-forgotten step. "Put your ear close with you move around—you can often tell where on the head the noise is coming from." If the 18th's slingers—the supporting underparts—move and vibrate from underneath, Tom tries directly looking for rail holes or pulls on the beam or the rail. He then drives a pair of bridle claws in the square, about an inch apart, through the head and 1/2 to 1/3 inch into the slinger. He uses a 10-inch—slightly smaller than the 18th's—he'll be hammering in—driving the hole in to make a 1/2. These pins help prevent the head from splitting and direct the rails into the head of the slinger. "If you start to find, there's a chance the rails will follow the wood's grain back out the side of the slinger," Tom says.

2. To remove the 1/2-inch long bit from the rail through the head and into the slinger. "Driving nails at an angle really helps drive the head," he says. To avoid moving the wood, he strikes the nail with a 1/2-inch nail, driving the nail heads in back before the surface of the wood. "Put some weight on the head after you've nailed it, it will move, you might need another pair of nails a little further along the head." Finally, he fills the holes with a dab of wood-colored putty.



FIXING A LOOSE PALUETER

Palueters—the vertical splines between the ceiling and the beams—are either nailed or held in place by wood or stone mortise-and-tenon joints. Regardless of how they were originally attached, loose ones are repaired by substituting them with rails. A top rail and rail have partially emerged, Tom either pulls them with rails or inserts them with a rail set. Then he drills new holes slightly smaller than the old, 1/2, or 1/2 inch into the beam or handle. Drilling is essential and 1/2 to 1/2 inch into the beam or handle. Drilling is essential without it there's no way Tom can get the rails in and avoid splitting the wood or knocking it out of position.



REATTACHING A HANDRAIL TO A NEWEL POST

5. Tom checks a 1/2-inch diameter with a 1/2-inch diameter into the top of the post, then makes a hole from the underside of the post into the rail while firmly holding the rail down. After a quick exchange with the owner, the 1/2-inch wood screw through the hole, seating its head in the bottom of the 1/2-inch deep recess cut by the countersink. If the rail is rounded to the post's side, Tom drills into the post from the rail's underside.

TOOL BOX: BACKSAW

With its hardwood plastic grip, black steel spine, and steel, leather-like teeth, the backsaw is the finish carpenter's scalpel. Ideal for any cross-grain cutting that requires the utmost precision.

"When I got into this business 20 years ago, we'd use a backsaw of any kind," Tom says. "It's great for small cuttings or half-log joints." The saw gets its name from the folded metal "back" along the top of the blade, which prevents the thin blade from buckling on the joint—or cutting—wrong. Yet it's the tiny teeth that are responsible for the tool's reputation for precision. They have almost no "set" (they rarely bend out from the plane of the blade) and so leave a narrow kerf as they cut. That's good for fitting plugs and filling joints, although it means the saw is more likely to bind. To prevent that, Tom subject his backsaw with gentle pressure, which can make work.

These days, Tom relies on power mills more for most finish work. But his vintage backsaw—he's had it so long he can't recall when he got it—is always close at hand. "There's nothing sweeter than using a hand tool," he says.



3. "Before coming up the stairs will be able to see the underside of the newel post, so I need to pull the screw back," Tom says. Instead, he fills the hole with a 1/2-inch long wooden plug cut from the side of a 1/2-inch board. He holds the plug in some yellow carpenter's glue, pushes it into the hole, and taps it home with a hammer.

3. Tom slides a sharp backsaw (see "Tool Box: Backsaw") left underneath the post and from the plug back. He lifts the back saw just with 120-grit sandpaper and it's ready to be pushed out. "If the joint is not too tight, he can be pushed out with a 1/2-inch, then drive on some paragoned or finish with a disposable fine tooth.



Desk Job

A compact workstation boosts the efficiency quotient of a kitchen—and a family

BY RYAN ROBBINS

Like many of Brooklyn, New York's Victorian-era row houses, Christine and Kevin McKean's 1701 brownstone was built in the English-tradition family-room-apartment, kitchen-downstairs. But in the 1960s, the kitchen level was converted into a rental garden apartment, with the original bachelor's pantry serving as a kitchenette. So when the McKeans decided to reclaim the entire structure as their single-family home, the old pantry and surrounding rooms were the logical spot for the new kitchen. And a simple clinic, quickly because the owner for making the household have with modern-day efficiency.

"I wanted a place where I could put the kids in with the children"—said Jack, 41 years, and Emma, 3—"you point to and a book," says Christine. "I expected to make a cook in an apartment," she adds, but New York City-based architect William Rogers "brought boxes of it and convinced us to design a movable desk right into the kitchen."

Step Rogers, a veteran of regional Victorian restorations, "A town house of the period would never have had a desk in the kitchen. But today it's almost a necessity. So we incorporated the bachelor's pantry's handsome details—dark beechwood, paneled tops, dark wood—into a window, 30-inch wide by 22-inch-deep desk to make it look like it had always been here." Indeed, it would take a sharp if not blindfolded eye to deduce that this astonishingly handcrafted red oak desk, whose features blend with those of the adjacent kitchen island, had not accompanied the house throughout its 150-year existence.

Kathleen Donohue, GCIM/20, author of *Kitchens and Bathrooms Design* and an educator for the National Kitchen and Bath Association, appreciates the his-



The red beechwood desk has the graceful look of a built-in, but also the flexibility of a free-standing piece—sliding with an electric motor to reveal its necessary 30-inch overhang from the lower adjacent cabinet's pantry. The adjacent cabinets of which are painted in the background.

PHOTOGRAPHS BY JOHN GRUEN



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several misadventures. "Even in the 1950s and '60s, American lockers were designed using outdated time-and-motion studies and conceived as a laboratory half-life test, with the social function completely cut out," she believes this represented an unfortunate shift from colonial times, when everyone gathered in the kitchen to eat, light and wash. Carpenter Demolish: "Adding a desk makes the lockers more versatile and allows it to draw people together again."

With its single pull-out drawer stocked with a checkbook, stamps, envelopes, and pens, and its surface outfitted with a

mill saw and reading lamp, the kitchen desk is a perfect station from which to answer family correspondence. Or draw up a quick sleeping list—the pillows and refrigerators are within arm's reach. And at 30 inches in height—half a foot below the island counter-top—it is low enough for kids to look like Jack and Jason to sit at or make brownies on, or, as a dad, dangle over their homework while Mom and Dad tend the wait pan a few feet away.

"I never spend more of my waking hours at the kitchen, other than the desk," says Christine. "I don't know how we'd be able to function without it." ■

RECIPE FOR A KITCHEN DESK

Although architect William Rogers provided the inspiration for the McKenna's kitchen desk, the general idea came from contractors Doug and Drew Elliott, owners of Square Indigo Inc. The Brooklyn, New York, woodworkers' biggest challenge was to produce a new article that would pass for something built a century ago. Key to their success was matching the desk's color to that of the kitchen's salvaged turn-of-the-century cabinets. They achieved this by staining alcohol-based mahogany (black) and cherry (lighter) stains until the right tone was reached. Then they cross-hand-rubbed all of the desk's components with two coats before assembly began.

The desk's three-tiled case is composed of beechwood panels framed in rough-hewn red oak stiles. The cross first turned and a pair of bracketed front stiles and two square rear corner parts, everything then to receive the stained side and back rails. Then they grooved the inside edges of the frame elements to hold two back-to-back panels made of 30-inch-wide, 3-inch-thick oak

beechwood stock—one facing out, the other in. Each individual board has a bevel grained along its tapered edge to conceal the joint with the adjoining board, and a second purely decorative bevel running down its center. The woodworkers needed 12 such boards to form each side panel, 16 were needed for the back. Two continuous boards, oriented along either side of the front-right corners, trim the border of the panels.

With the beechwood beveled inside the frame, the crew clamped the entire case and secured the rails and stiles using 15-inch steel wood screws. A single beechwood running board along the desk's base further braces the case.

To bolter a 30-by-36-inch desktop, the men joggled and glued up four oak stiles, cut the laminated piece in two, then nailed it to a uniform 15-inch oakboard. Next they mounted the surface from below by screwing through two tall stiles that are rabbeted into the upper stile and upon the cabinet's notch. The

slightly overhanging lip is supported by the front stile's beveled detail.

The 36-by-32-inch, 13-inch-deep pull-out drawer is a rippled-front and rabbeted frame of tall oak with a maple plywood bottom. The woodworkers mounted the raised-panel drawer front from the inside with rabbet-front screws. Once the majority of the desk was assembled, the team applied four coats of tungsten, sanding between coats with 400-grit sandpaper. Finally, the shop beveled outside, white-washed steel slides for the drawer and two tightly perforated 15-inch-diameter bolts that mark the idyllic vintage hardware.

After Square Indigo delivered the kitchen desk to the McKenna residence, young Masters took and Mom quickly charmed it with their own style of handwork: hanging papers into the deskbox while sipping from their mugs.



ILLUSTRATION: JAMES HARRIS

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Twelve hours after applying a chemical stripper, painting contractor John Doe scrapes off the top layer of varnished fence paint. A respirator safeguards the lungs from the fumes of water-based lead paint.

Baring All

Used with care, chemical strippers peel off old, unwanted paint

As the general contractor for *This Old House*, Tom Silva seems to be in a constant fight to liberate houses from the grip of old paint. Among his more recent battle-grounds were the TV show's 1997 project house in Michigan, Massachusetts, where 15 rough, peeling layers, many containing lead, obscured details of an intricate staircase and created the ominous clay-bonzo, the 1994 gothic house in Watertown, Mass., with its paint-clogged staircase and doors, and the 2000 project house in Chatham, Mass., where none of the exterior brick had been bared beneath a quarter-inch of latex, oil, and lead paint. In each case, Tom turned to chemical strippers, formulations that dissolve the

chemical bonds in a coating so that it can be scraped away. "They're like magic," he says. "You brush or spray a stripper on and scrape and paint off, sometimes several layers in one stroke."

Chemical stripping is one of the best ways Tom can get rid of old paint. One is to rip out the old material, pour and fill, and replace it with new, but contractors don't often make sense. "A piece of wood that's solid walnut or pine would be very expensive to replace, especially if it has a special profile," Tom says. And stone details, like the entrance carved globe door in Watertown, are unreplaceable. Power sanding is the brute removal method, but also the one most likely to damage the underlying surface and blow dust into the air, a serious



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the only viable protection for hands is heavy-duty rubber, nitrile, or neoprene gloves. "Latex gloves like you get at a supermarket are not enough," Collins says.

The group of solvent-based scappers known as olefinic amine, or ODA, is smoother of the "suds" finish converters now on most shelves. Like NMPs, with which they are often paired, ODAs evaporate slowly and can work through many paint layers at once, although it takes even longer than NMP. When using ODA scappers, conversion will often come on a thick layer and come a overnight wet-glassy wrap. When it comes time to remove it, the primary residual-lags to the mess, and get some more messy.

DBPs have long been used in laund closures, and have been marketed as the "safer" of all aerosols. But the CPSC became concerned about these marketing claims after some people reported illness when working with the solvent in poorly ventilated spaces. Industry-sponsored testing in conjunction with the Environmental Protection Agency is underway to confirm or refute these concerns. Final data are not yet available.

The fourth sub-type trigger is a combination of acetone, toluene, and perchloro (ATM). Like acetone-chloroform, these highly volatile chemicals can be extremely effective at removing paint, especially when pre-mixed with wax and dishwashing soap. The active ingredients close to the surface. Philip Perengowski, whose Strix 1000 sponges fall in this category, says there are the same solvents found in cans of high-pressure paint, where they keep the solid ingredients in solution. "This trigger paints the solvent back into the paint, but without stirring the contents to liquid," he says. "It breaks the adhesion or bonds where the paint stuck to the wood." An ATM trigger can reduce the power from an old marmoset at the Old GM House project in Wisconsin and suggest that paint to be effectively "The wall was missing," he says. "We sprayed it on, left it overnight, and by morning it had left the first stick off."

According to the manufacturer's material safety data sheet, if inhaled or absorbed through skin contact, ATM sprayers can irritate the eyes and skin, damage the lungs, liver, kidney, and heart, as well as the central nervous and reproductive systems, and can be fatal if swallowed. They need to be used with



Once a stopper surface print, "it's a ton of work getting it out of heads and crannies," says Tom Weber. The job goes faster with clamp pullers whose jaws are fitted with different blades.

plenty of ventilation and the proper safety gear, including splash proof goggles, heavy-duty gloves, and a respirator fitted with organic vapor cartridges. These stoppers are also highly flammable—cigarettes, pilot lights, and sparks from electrical equipment can set off an explosion if the vapors concentrate sufficiently.

The only homeless way for chemicals to creep onto skin is with creams, ointments, sprays. Make sure creams, ointments, sprays, they are through many layers of clothing the same way we have dusts, cleaners, dyes, the same in a closed space. This slow but steady chemical action is remarkably effective, but over the time is gone, alkaline sprays don't work. They'll stain and discolor, improve wood and will attack the new brass alloys, stainless steel with an acid base. Skin and eyes are equally at risk, making goggles, chemical-resistant gloves, and protective clothing essential for anyone applying or removing the sludge.

Because it's hard to know how deeply and uniformly the mountains had thinned its work, repurposing is a gamble. "I usually stay away from shallow depths on sand," says Don, "except on dunes or places where I can find the area with plenty of waves and an acid." Everywhere else, he uses anhydrous chloride when he's in a hurry and a thick 50/50 sump when he has more time. Then he steps back and moves on to the phase every painter loves: applying a fresh finish. ■



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Garage Garret

Building an art space in
becomes a creative gallery



The cedar block garage with its single dormer (garret) was remodeled (over) to feature a home-like facade and a new studio on the upper level.

I had been almost 20 years since I had helped a friend build his house in Vermont, but the thrill of building, not with my own hands, but with the help of a friend, was still fresh in my memory. I knew that some sense of accomplishment was just months away as my wife, Lisa, and I considered the potential of our own cedar block garage with its parking area in the back. The 1950s garage, which sat a good 500 feet from our converted 19th-century stone schoolhouse in New Hope, Pennsylvania, was a sorry cypress. I just couldn't wait to get my hands on it.

I had visions of turning the garbled and decrepit upstairs into an office from which I could write, drawing inspiration from miles of the countryside. But Lisa hoped to give up her freelance design business to pursue a career as a full-time artist, and she desperately needed a studio. Painters have a lot of stuff, paint supplies, canvases, and frames that not 1,500-square-foot one-bedroom house could handle. It was never practical to give the space over



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BY TERRY MUFFATT PHOTOGRAPHS BY DEBBIE ROSS

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in less, so I decided that building Lisa's studio, rather than wing, would become my creative outlet.

Although the second floor measured a seemingly spacious 17 by 21 feet, there was hardly any headroom, and even for 3-foot 3-inch Lisa. The ceiling sloped from an 8-foot peak to a 5-foot-high wall on the south side and a 2-foot-lower wall on the north. It was difficult to envision how previous owners had used it as guest quarters—I was asked that it was designed to be a dormitory. It was even built for Lisa to imagine no very light-filled space, one big enough to hold her 60-foot easel and accommodate large windows capable of venting the fumes of oil paints and solvents (there were only three partially tinted windows). "It will be the studio of your dreams," I promised. "All we have to do is raise the roof."

Measuring the space without expending the loopy, we determined that we'd build up the north and south walls to 8 feet and put on a new roof that would allow a 12-foot cathedral ceiling. But to keep costs down, the original staircase on the east side—the only entry into the studio—would stay. For more light and ventilation, the design included an assortment of feature windows and light fixtures, some of which would have cost more than the entire project. The north wall would hold a set of double French doors (functioning as air-exit windows) and two additional windows picked up as a salvage find. The extended height of the south wall allowed us to accommodate a row of three 18-inch-high windows—actually kitchen pantry doors with wavy leaded-glass panes. The overhead lighting scheme was derived around five old school-gymnasium pendant lights that cost

Measurements matter: Lisa's studio is actually designed around salvaged materials and left space, even more. Lisa stands next to the work in progress. Sorry French doors, it's time to go.

us \$25 for the lot. We loved them as much for their whyness as for the abundant light they'd provide. Since we weren't picking out our art in the downtown garage but in the dormitory that runs on the side,



that new space would become my workshop's workshop for the project—and, eventually, my office.

On the exterior, we wanted that extended staircase would appear too heavy. To add character, we planned to raise the roof from the center while leaving a crest of 24 inches of the old roof on either side of a two-sided dormer that would extend from a new ridge beam. Lisa also wanted to give the garage a better look, so we decided to construct a new part of her doors on one of the bays.

After Lisa described the plans, a local architect contacted them via blueprint. Then, on a warm August morning, with building permit in hand and first upper agent at full throttle, we set to work yanking out the second floor's old 12-foot-wide walls and ceiling, the insulation, the framing, and the building's limited wiring. But we had just two weekends to go before friends would gather for our roof-raising "party," and we still had to demolish the old roof.

We got lucky. My sister Margaret, my sister Jenny, and a handful of constant supporters as the first weekend with a rain. So, in addition to bathroom, every able body got a taste of labor (it was like to climb a step the garage and step on two layers of asphalt shingles. Removing the roof's 2x6 joists and groove planking took the rest of that weekend and most of the week, revealing a shaggy's



dormer. The 40-year-old yellow pine joists were in excellent condition. I pried each of them up and handed them down to Lisa, who stretched and covered them with a tarp, figuring that they might one day be useful.

By the time our pals Phil, Richard, and Chris arrived, we were ready to start framing.

Through I could hardly wait, the architect, recognizing that the house's load would increase, suggested my own last resolution: the full beam that ran across the center of the garage ceiling, supporting the first joints of the upper story. Hearing his advice, we nailed two 2x6s on either side of it. With the floor squarefooted, we moved upstairs to construct the framing for the new roof wall. With a little rain, Chris and I filled the 10-foot section of framing plywood. Richard checked to see that it was plumb, and Paul secured it in place. Lisa, standing below us in the street, applauded. Her studio was taking shape.

Excited about our progress but realizing how much help we had needed to get done, Lisa looked around our friends left. "Can we really do the rest by ourselves?" she asked. "I sure hope so," I said, knowing that work just the two of us squeezing the work in between our day jobs (mine as a magazine editor, hers as a freelance art director), it was not going to be easy.

As I expected, securing the rest of the rafters was the hardest part of the job. At 15 feet long, they were difficult to maneuver and weighed a ton. Even more taxing was the fact that we couldn't use a single pulley to cut the rafters—the building was 4 inches wider on its west side than its east, perhaps due to shaling over the years. New measurements had to be taken for almost every board.

By mid-October we'd made progress. The rafters were in place, and on the north side, the dormer, encompassing the French doors, and the narrow bay window were framed out. We also had built a section of roof to cover the parking area at night, and I finished sheathing the building with 1/2-inch plywood.

To free us up until the weather and doors, Lisa tackled the job of sheathing the roof. By now we were on a five-course home with the staff at the lumberyard, and we picked up installations after them. Lisa also ended my do-it-yourself streak.

Because the weather was turning colder and the days shorter, Lisa was set on sheathing the roof in a week. I was more concerned about the 15-foot drop, and borrowed some scaffolding. I also asked my neighbor to keep an eye on her while I was at work.

Each morning, before driving off, I'd carry things up to the roof, where Lisa would be perched on a thick foam pillow—a trick of the roofing trade she'd read about. "You can sit on it and you won't slide off," she assured me. Most evenings, she was still up there and



The rise of the garage, and the putting plants (scaffolding), is under construction (10/10/02), with plans to glass in a greenhouse.

from the building, born and with every door and pipe run.

Because of the cold, persistent winter, we took a break. But by the first longer, lighter days of spring, I was able again to get back to work again, and was getting myself back by the end of that summer for single-handedly using the studio wall, with the help of friends, putting up 1/2-inch drywall on the ceiling and north wall.

I was eager to install the rest of the drywall, but Lisa, wanting something more rustic, suggested we paint the remaining walls with the old roof planking. I blew dust at the thought of having to sand the boards' rough surfaces, so Lisa found a local carpentry shop willing to save me the effort.

After 15 months of construction and roughly \$12,000 of expense, the new 310-square-foot studio with its tongue-and-groove pine floor and white-washed walls was ready. Fill the room again with Lisa's work area, the other as a space for living with yellow-stained two cupboards built in storage to look like a barquette. Every now and then I'm tempted to kick Lisa out and turn the studio into an office for me. But making the space is considered work in progress as she prepares for her first one woman show, and I know deep down that this is her rightful place. Eventually, I'll build my office downstairs. I've come to view the roof of pine in the morning, and now realize that I, too, have found my true creative outlet. ■



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Under a gold sky, a lone woodman emerges to try and haul over his shoulder and down a log with a chainsaw crack. As it fractures into fragrant sticks, he swears logs to warm up and his head aches. This is labor in an modern way, but with a pinch of passion. The rough faces of a split log show the wood to dry more quickly, crack more usually, and burn more readily than fresh, bark-covered cylinders.

Roger Cook, 70, a Hampshire contractor, can and splits firewood throughout the winter and early spring when the New England landscape has dormant, he delivers it to customers the following seasons. "The task is my winter culture," he says. He splits logs by his truck-bed, and he depends on a gas-driven hydraulic splitter. "You can cut

one," says Roger. "But the only makes sense if you have at least a cord of wood stacked—or two sections—of a cord of one." (A cord of log is 4-by-4-by-8 feet, or 128 cubic feet.) But if Roger has to make quick work of just a few logs, he grabs a wedge and a chainsaw and trims them to some mid-forty-inch proportions.

Roger depends mostly on his wedges for hand-splitting outdoors. These wedges are oak. But he finds a much more convenient for work like oak or maple that hasn't been used with one with glass blades (see "Splitting Techniques and Safety Tips," page 35). "Splitting wood—either by hand or machine—is one of those activities I get lost in," says Roger. "It's easy for me to get cross-eyed, and wood is hard enough wood to keep the brain from having all those



The heavy-duty wedge is made of hard maple. It's the same size as the one used in the photo.



When the splitting wedge is used, it's the same size as the one used in the photo.



When the wedge is used, it's the same size as the one used in the photo.

SPLITTING TECHNIQUES AND SAFETY TIPS

HAULES AND AIDS:

- Always wear impact-resistant eye protection, steel-toed work boots, and heavy gloves, if doing split operations.
- Choose a log that's light enough to be swung in a controlled manner, and be sure to hold it tight and the handle secure.
- Never step near people, in case the head comes loose.
- Use a clamping block that extends the top of the log wider than the head and below the point.
- Stay relaxed. A tight grip increases stress and fatigue.
- Swing down in a straight line with your body.
- Aim a few inches below the top of the log and angle the head slightly off the vertical, which increases the wedge effect.
- Bend at the knees as the head comes down, so the handle will be horizontal when the blade enters the wood. This transfers most of the weight energy straight into the log and reduces the chance of a glancing blow hitting your leg.
- Never swing a head or a log with a sharp, the impact can harm or even shatter the wood head.

WEDGES:

- Always drive wedges with a sledgehammer, which has a hard-wood striking face, never with the back or side of a head or ax, unless it's made specifically for that purpose (like the one of left).
- Before using a wedge, grab off logs that have split from recent use. Splitting such a "musclehead" log can shatter the wedge, sending small pieces of metal shooting off the shrapnel.



Fix-Up Funds

For big projects, construction and renovation loans can be a better bet than home equity lines or credit cards

BY SARAH L. ROBERTS-WITT

Two more four-year home buyers, a 125-year-old house with severely water-damaged walls and one tiny, heavily used bathroom wouldn't exactly qualify as a dream purchase. But for Fandy Engle, a 38-year-old business development manager for eBay, this charming wreck of a place in the Philadelphia suburb of Ardmore was low on her list. Though he had looked at another house in the same neighborhood, none was as large or as affordable as this \$79,900 five-bedroom brick Colonial.

But there was a catch. Besides coming up with the money to purchase the property, Engle also had to figure out a way to immediately fund many of the significant upgrades it needed. "I saw the place last September, and I knew that some of the improvements, like fixing the

ILLUSTRATIONS BY CHRIS PYLE



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aged paper, would have to be made before sale," he says. After getting estimates from contractors and factoring in about 30 percent for overheads, Engler figured he needed an additional \$30,000.

His options were limited. While other buyers in Engler's short-sale home against the equity in their existing homes, use personal savings, or tap credit cards to underwrite renovations, Engler didn't get over a home, and he needed to apply what he'd be paid in the down payment. He couldn't refinance a mortgage that exceeded the value of the property, and a home equity line of credit after he'd purchased the place would not have covered the cost of the repairs.

Facing the odd possibility that he wouldn't be able to buy the house after all, Engler made a round of calls to banks, contractors, and friends who had recently purchased similar places, asking if they had any suggestions. Several people pointed him toward the local source of funding: construction and renovation loans.

Offered by almost every lender, these products are marketed under many names, such as the Purchase & Renovation program from Wells Fargo, Fannie Mae's HomeStyle loan, and the FHA 203k loan underwritten by the Department of Housing and Urban Development (HUD). All work the same way: They let first-time buyers, as well as existing homeowners, roll the funds necessary for improvements directly into their mortgage.

With a 30-year Fannie Mae HomeStyle construction loan from a Tim's-based lender, Engler was able to borrow the \$74,000 he needed to purchase the house plus an additional \$20,000 to bootstrap the upgrades, which included modernizing the kitchen, reroofing the roof, and adding a bath and a half. At the then-prevailing mortgage interest rate of 8.5 percent, the money for improvements added less than \$300 to his monthly payment. "I wouldn't have been able to buy the place without this kind of loan," he says. "I didn't have the cash for the repairs, and I couldn't live there without making them."

WEIGHING YOUR LOAN OPTIONS

Construction and renovation loans have been around for a couple of decades, but lending companies have only started promoting them seriously in the past few years or so, as consumer interest in home improvement has skyrocketed. The two financing options offer similar rates (in early October 2011, the national average was about 6.3 percent on a 30-year loan) and can be handled with any type of down payment. The chief difference between them is that the amount of a construction loan, which banks typically give to new buyers, works as more and increases to an agreed-upon cap as the money to pay for the work is requested and approved, a renovation loan, geared toward existing homeowners, is generally a fixed sum determined up front.

For people doing a major improvement project, these loans are often more desirable than home equity lines. One key reason

Though home equity financing can extend to as much as 125 percent of a property's value minus the mortgage payoff, most homeowners lack a sufficient stake to meet the costs of a large-scale renovation. By contrast, construction and renovation loans have no maximum except the permitted appraised value of the house after the fix-up is completed. What's more, because the lender is permitting a new mortgage, the interest rate on such loans is typically several points below a home equity line.

In exchange for generally desirable terms, however, banks are stringent about what construction and renovation loans may be used for. As a rule, lenders will not finance improvements that don't directly add to the appraised value of the house.

And they require the homeowners to submit a detailed list of proposed changes. So while that new bathroom or kitchen will almost always be approved, middle counter tops probably won't, unless they boost up the neighborhood list item. "Some counties in town luxury improvements are allowed," says Katrina Jones, the director of product development for Fannie Mae's HomeStyle program. "What we try to avoid financing are unnecessary renovations that you don't really up with other homes in the area."

HUD tends to be conservative than that. Through its 203k loan program, the agency will lend up to a maximum of \$132,000 to convert an area to land work that is needed to bring a property into compliance with local building codes, as well as improvements like updating kitchens and baths.

While that may not be enough to satisfy many buyers, for those in lower income brackets it can be the key to home ownership. "To purchase the property, buyers are required to put down only 3 percent of the after-renovation value (plus closing costs and fees). The mortgage interest rate, however, tends to be a bit higher than that offered by other lenders for similar types of products, due in part to higher administrative costs."

DOING THE MATH

To determine the amount of financing, lenders ask an independent expert to consult with the contractor or borrower on a web form that estimates the costs for requested improvements. That contractor, who is paid by the homeowner and charges between \$400 and \$1,800 (the fee can be rolled into the loan), also certifies the value of local properties that are comparable to the homeowner's house post renovation. By weighing the cost of improvements and the potential value of the house after fix-up, the lender then sets a firm loan amount.

Banks are keen about the quality of the construction work, in some states requiring that renovations be done by licensed, bonded contractors and completed within a specified time period. Homeowners are generally paid brief from doing work themselves, except in the case of 203k loans, which permit homeowners to do some of the



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but skilled jobs such as painting, or more difficult tasks like carpentry if they demonstrate proficiency. In all cases, funds are held in reserve accounts and only disbursed to the contractor when the contractor completes his required and signed off on each phase of the job. Because the finished product is essentially the bank's collateral, "the bank is something of a risk for us, which is why we have assigned all the inspectors before any money is released," says Desmond Smith, senior vice president in charge of small programs for Wells Fargo. "We are looking out for the borrower's best interests as well as our own."

With banks moving away from a watchful eye, these options are obviously the wrong choice for people who prefer not to have a lender as a partner during renovations. That was the conclusion reached by Kim and Terry Block, who last August bought a 120-year-old farmhouse outside Raleigh, North Carolina. The home badly needed to be upgraded for tenants, it lacked a down payment or credit accreditation, both virtual prerequisites for comfortable living in that part of the country. However, after considering selling a conservation loan to his mortgage, Terry, a carpet installer and skilled do-it-yourselfer, decided he would rather tackle the labor himself than work with strangers in a volatile, "The purchase and renovation type of loan was definitely

appealing, but we really felt that we could do most of the work ourselves or with the help of our family and friends," says Terry, who tapped savings and profits from the sale of his existing home to meet the \$38,000 monthly cost. "And we could do it at our own pace."

But even experienced investors sometimes face projects that are too expensive or costly to handle without an infusion of cash from a construction loan. Chris Cautello ran into this situation a couple of months ago when he bought an 1890s farmhouse in Farmington, Illinois. A maze of small, dark rooms with only one bathroom, the house had to be relined significantly before he could move in. In 1999, Cautello had remodeled a 1900s craftsman cottage in Farmington and covered the \$60,000 job with a home equity line on his credit and credit cards. This time, though, the amount he needed to fix up the house was more than twice that, well beyond what he could squeeze out of any other source.

Cautello resigned to the fact that he'll have to forgo costly blower doors or kitchen charities, but at least with the bank's money he can make the farmhouse up-to-date and livable. "With a construction loan you don't have quite as much freedom," Cautello says, "but when a place needs \$155,000 worth of repairs, at that cost alone, it's a pleasure to have that as a financing option." ■

A HAND FROM THE STATE

Many state and city governments offer their own home tax lien revitalization or historic preservation. The 200-year-old town of Norfolk, Virginia, for example, has a Neighborhood Conservation and Rehabilitation Program that lets homeowners borrow money at an interest rate of about 10 percent to fix up historic cottages, town-city bungalows, and townhouses in 11 of its oldest neighborhoods. Provincetown, Massachusetts, and Maryland are other states with noteworthy rehab programs. For more on sources of funding for historic home projects, including tax incentives, see "Smart Money," June 2007. As with most rehab loans, there's some sort of security attached. In Norfolk, for instance, the money must be paid back within 10 years. In addition, the city has set strict rules for renovations, requiring that properties be indistinguishable without modifying their historic character. For example, homeowners may not lower ceiling heights, but they are encouraged to add climate and energy efficiency to make the houses suitable for contemporary living. Preservation loans, which most states also offer, are even more stringent. For one thing, they are usually available only for properties that are listed on a state historic register or the National Register of Historic Places. New Mexico's Historic Preservation Loan Fund, for example, partners with local lenders to let homeowners borrow up to \$200,000 at below-market interest rates, but the state's portion of the loan must be repaid within five years. Check city and state Web sites or call municipal offices to find out what's available in your area.

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HOMEOWNER'S HANDBOOK

Materials

When Tom Sells gets ready to frame a partition wall in an existing house, his advice about lumber is short and to the point: "Get a good grade—number two or better—kiln-dried, straight, and true." The first thing to look for is the grade stamp. This label, inked onto each side of dimensional lumber, identifies the species, moisture content, and quality (the grade) of that particular piece. Any grade-stamped stud is suitable for framing, regardless of the species, even when made from finger-jointed stock (short lengths glued together). But a kiln- or air-dried stud (stamped KD or AD) shrinks less and is more stable than one that's "surfaced green" (stamped S-GRN).

A grade stamp offers no guarantee of straightness, so for sawn lumber, check each piece by sighting down its length. Alternatively, consider using engineered studs, made of glued wood veneers or strands, which do not warp. Such perfectly straight studs promise fewer headaches in lockers when the time comes to hang cabinets and fit counters, and provide the superior stiffness needed when a wall soars 12 feet high or more. "But for small partitions, regular sawn lumber is plenty strong enough," Tom says.

PLANNING AHEAD

- To estimate lumber needs: Plan for one stud per foot of the wall's length, add four studs for each clear opening. Add the two plates, two header pieces per rough opening, plus cripples.
- Space studs 16 inches on center—most 16 inches apart—for the steps of drywall joints will land at the center of a stud.
- If a partition falls between joists in an exposed ceiling or between unsupported wall studs, install 2x4 blocking between these framing members—every 4 feet in a ceiling, every 16-18 inches in a wall—to provide a solid surface for nailing.
- If the ceiling is covered with wallboard and there are no joists to nail into, equate a bead of construction adhesive on a 2x4.

- Press it to the ceiling, set wedge + stud vertically against it until the adhesive dries. Measure the height of the wall from the face of this piece (not the actual ceiling). Once the wall is assembled, drill through the top plate and into the 2x4.
- If the abutting walls are unsecured (drywall), do not nail the stake at each end of the partition to the sole plate. When the partition is ready to be raised, run a bead of adhesive on the abutting wall where it will meet the partition. Till the partition into place. Then press the stud stake tightly against the exterior and toward there to the sole plate.
- If the wall will have a door, be sure it will have room to open.

Tools



1. Level, for checking whether studs are plumb
2. String/line/level for nailing the sole plate into position
3. Framing square for marking out and layout lines across the edges of ganged studs
4. Tape measure
5. 2x4s, framing batten
6. 1x6 and 1x4 nails
7. Fencil
8. Check level for marking location of wall on floor and ceiling
9. Plumb hole for aligning layout marks between ceiling and floor
10. Triangular square for marking plates, headers, and studs, and as a fence to guide circular saw
11. Circular saw



STEP 1: LAY OUT THE PARTITION

- Mark the ceiling 3 inches in from one wall where the face edge of the partition will start it. From that mark, drop a plumb bob, and mark the floor where the bob's point comes to rest (zero). Repeat at the partition's other end.
- Check the distance from each floor mark to its abutting wall. If it measures more or less than 3 inches, that abutting wall is out of plumb. Record the difference between the top and bottom measurements at each end for Step 2.
- Using the marks as a guide, snap a chalk line on the floor and the ceiling. Measure along the chalk line on the ceiling and the floor to determine the lengths of the sole and top plates. Cut the plates.
- If a doorway is planned, add 2 inches to the door's width and height to determine the dimensions of its rough opening. (When working on a finished floor, add 1/2 inches to the door's height.)
- Cut the two jack studs 15 inches shorter than the height of the rough opening. Cut the two end or plate 3 inches longer than the width of the rough opening.



STEP 2: MARK THE PLATES

- Lay the two plates face-to-face and edge-up in the position they will be in when the partition is raised. If both walls are plumb, line up the ends flush with each other. If only one wall is plumb, line up the ends that will butt up against it. If neither wall is plumb, stagger the ends of the plates by the difference indicated in the plumb bob measurements in Step 1.
- To find stud locations, hook a measuring tape over the top plate's ends. Pull it back from the doorway, make a mark at 16 inches and continue making marks every 16 inches—4 inches shy of the end 16-inch increments on the tape measure. (The end-to-end stud can be closer than this to the end stud.)
- Place one of the header pieces against the sole plate where the door opening will be. Draw a line on the sole of each end of the header. Use a framing square to draw a second line 13 inches out from there and parallel to the first. (One leg of the square is exactly 13).

STEP 4: ASSEMBLE THE PIECES

- Lay all the pieces on edge and in position on the floor. Line up the ends of the studs with the marks on the sole and top plates. Line up the ends of the cripples with the top plate and header.
- Follow the assembly sequence shown in the illustration at the top right. Start with the components at the clear opening, finish with the corner studs.
- Join pieces at right angles to each other first, by driving two 16d nails, sole by sole, through the floor at one place and into the end of the adjoining piece (left).
- For face-to-face connections (back studs to kings, the header pieces) use 16d nails driven every 12-16 inches in a double pattern.

TIP: For a nonload-bearing wall, jack studs may be placed together from scraps of 2x4s until they completely fill the gap between the sole plate and the bottom of the header.





inches wide.) Pencil an "X" between each pair of lines; this shows where the ends of the king studs will land.

• Remove the header plate and draw parallel lines 18 inches in from the lines that mark the ends of the header. Pencil an "X" between each pair; this shows where the jack studs will land on the sole plate (next).

• Using the square as a guide, transfer all six king- and jack-stud lines to the top plate. Pencil in matching Xs and Os.

• Go back to the first stud mark made near the end of the top plate. With a square, draw a line across both plates of that stud. Working away from the end, draw a parallel line 10 inches from the first. Repeat at each-stud mark; draw a line 10 inches from and parallel to each end of both plates. The ends of the corner studs will land between these pairs of lines.

• Place a header plate against the top plate between the king-stud locations. As always, leave five feet from the work on the top plate to the header. This shows where the rafter studs will land.



STEP 3: MEASURE AND CUT THE STUDS

• To find the stud length, stack two 2x6 blocks face-to-face on the floor layout line and measure up to the ceiling layout line (above). These blocks represent the combined thickness of the sole and top plates.

• Take measurements at either end of the partition's location and at three spots in between. Count the number of king and corner studs marked on the plate and cut them all to the shortest measurement.

• Cut all the clips, including the two that lie against the king studs, to length: the length of the king stud minus the length of the jack stud, minus the thickness of the header.



STEP 4: TILT UP AND SECURE THE PARTITION

• When all the pieces have been nailed together, tilt the wall into position so that the back edge of the top plate lands along the line on the ceiling (1).

• If necessary, use a shinglehammer (and a scrap board "pawling block") to tap the back edge of the sole plate into the wall's chalk line on the floor (2). With a level, check that the stud edges are faces are plumb (3). Where the top plate isn't long enough to the ceiling, slide under the sole plate at the stud locations.

• If the partition runs perpendicular to ceiling joists, drive one 16d nail through the top plate into each joist. If the partition runs directly beneath a joist, nail into it through the top plate in every stud bay. If the top plate lands between the joists, nail it to blocking (see "Heaving Holes," p. 104).

• Fasten the sole plate (except at the door opening) by driving one 16d nail into each floor joist (4). If the wall sits in line with a joist, drive one 16d nail through the plate in each stud bay and into the subfloor. (On concrete slabs, drill through the sole plate and into the concrete, then drive in lagging spikes, masonry screws, or rod masonry nails.)

• Nail end studs with 16d nails every 12-18 inches into studs at blocking at the starting wall.

• Once the wall is secured, cut the sole plate out of the door opening with a hand saw. Cut it flush with each jack stud, without entering into the subfloor.

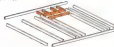
• To recede the faces of swinging doors, transfer each end of the plate under the jack studs with two 16d nails.



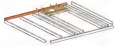
Assembly of a Partition Wall

- Boards laid out for assembly
- Boards being affixed
- Completed sections

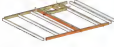
1. Cripple studs to headers



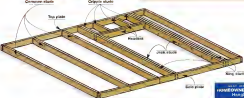
2. Header unit to top plate



3. King studs to sole plate



4. Corner and jack studs to completed sections



ZIGZAG BLOCKING



In most cases, a partition wall built with 2x4s or 1x6-inch members provides plenty of strength, but when Tom knows any wall more than 8 feet tall for one that bears a load, he often adds blocking. These short pieces of lumber, nailed between the studs about halfway up the wall, "help keep the studs straight, and so add integrity to the wall and make it stiffer." For this purpose, he prefers herringbone blocking, so called because of its distinctive zigzag pattern, which he routinely uncovers in older houses with studs that run a full two stories. (Blocking out edges up and flush with the stud edges serves another purpose: to provide a solid base for ceiling sheetrocking or enclosing pedestal sinks.)

Tom installs this blocking after the wall is raised into position. First he makes parallel 10-degree cuts in scraps of 2x4 so that the ends fit snugly against the two stud faces in each bay. Then, with two 16d nails, he fastens them through the face of each stud and into the blocking. The next piece he rotates 90 degrees relative to the first and fastens the block on one end and five up with the rear end of the first piece (above). So it goes until all the bays are filled. Then the wall is ready for drywall. "It's quick, cheap, and works great," he says of this "trick" that he'd rather than "dual?"

LETTER FROM THIS OLD HOUSE

When Life Imitates Work

BY DONNA RAPOLIN

BECAUSE I'm the editor of this magazine, everyone thinks I must own a perfectly maintained house, with contractors, carpenters, and tradesmen of every variety at my beck and call, charging through my front door to fix whatever's sort of whack. But, in fact, I'm just another homeowner, struggling to control the cracks, groans, and inevitable breakdowns of an aging house. It undertakes as many maintenance chores myself as I can, and make sure that those I hire out are done right. Like many of you, I occasionally contend with misguided advice, contractors who can't answer phone calls, and materials that don't get delivered on time. And even when a problem finally gets fixed, something new always pops up. The work of a homeowner is truly never done.

But if my responsibilities around the house are endless, the rewards of home ownership are just as endless. It's so satisfying to be able to seamlessly patch a plaster wall and finish on the perfect paint color, or to single-handedly silence the annoying drip of a leaky faucet. And when I do need help from a professional, I'm delighted to meet skilled tradesmen who demonstrate their remarkable ability to make my life easier, safer, and far more pleasant. Because when it's done right, the work gives back: My renovated kitchen inspires me to entertain more. My modern bedroom makes me feel calmer and more grounded. The newly outfitted family room—with plush carpeting and extra shelving to hold children's books and toys—keeps my kids entertained and happy.

Even if the handyman sometimes misinterprets the homeowner's, I know my best tradesmen help to make me a better owner. I can't tell you how often I say to the staff when we are leaving story concepts: "Oh, yeah, I want to know about that—I have that problem." Happily, you say the same thing every time you open the magazine. In shaping *This Old House*, I find the answers to my most pressing repair and building questions. The house-related chaos keeps coming, but, fortunately, so too do the issues of *TOH*. They will continue to serve me well as I take on my latest list of fix-ups, from repairing some water-damaged drywall to painting the foyer ceiling to fixing the right trend in the basement staircase. Asplendly out there want to lead me a hand!



As the owner of a 21-year-old house, *TOH* editor Donna Rapolin has seen her share of home repair work at the office.

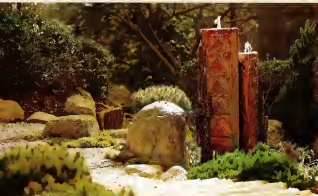


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Liam Arns, who has been with HGTV since 2006, was on David and Janet McCusker's house in Manchester, Massachusetts. The roof was covered with thick, brown asphalt shingles from the late 1970s. "It's in the gutter," they looked at it," says HGTV general contractor Tom Silva. "But when you get up there, you could see they were shot." Silva had ripped or clipped, much of their protective granular coating had eroded, and water stains were showing up inside.

all signs that it was time for new roofing. There was no question in the McCusker minds that the replacement material would be wood. A desire for historical authenticity influenced their choice—early photos of the 1850s house showed cedar shingles covering the roof—was all their love of the look of wood. "A wood shingle roof has such a wonderful texture," Janet says. Three old black-and-white pictures also showed that the profile of the original roofline was nothing like the

BY JEFFERSON HOLLE PHOTOGRAPH BY KOLIN SMITH



Chris Harnage fits a 2x12 LVL over a roof joist to close up the framing on the side of the dormer opening. These steel braces on the back of the house will reinforce the late-1970s shingles.

flat, skylight-decked expanse in place before the renovation started. "There used to be three wide shed dormers on the back, and two smaller 'wings-roof' dormers over the front," says the project's architect, Stephen Holt. After consulting with Hick and Tom, Jason and David agreed to reconstruct all five elements in their original locations, not only to break up the otherwise planar look of the top of the house, but also to bring more natural light and fresh air to the shed floor.

So, armed only with the pictures and a few clues left in the old roof framing, Tom and his crew set out to recreate these pieces of the house's past using some much-improved 21st-century materials. "The old chimneys and the wood thing [he had been taken off] because they leaked—we could use water-cement and the old roofing felt on the inside of the roof sheathing," says Tom. "This time, we'll use a combination of copper, metal, and wood. That ought to keep the weather out."

FRAMING THE DORMERS

By all appearances, a simple shed dormer doesn't look like much of a building challenge. But Tom says, "There are quite a few things to juggle when you plan how to build one." He first considers the slope of its flat roof. "You need at least a four-pitch, otherwise there's the danger of rain blowing under the shingles." (A four-pitch roof runs 4 inches for every foot it covers horizontally. Tom ended up with one that runs 4½ inches per foot.) Next he works out the correct height of the window and its distance from the floor. The taller the window, the longer the dormer has to be in order to maintain the minimum roof pitch. And the longer a dormer, the closer the window comes to the eave, and to the floor. In this case, Tom decided to have the sill of each dormer's window where the old framing indicated it had originally been. That determined the dormer's length and, by extension, the window's height. With a little tweaking of Holt's design, he made the opening just big enough to accommo-

diate standard-size swing windows. (Kitchens, made-to-match replicas of the original windows would have doubled the cost of the dormers.)

Finishing a shed dormer is a reasonably straightforward exercise. First, Tom's crew scraps away all the old shingles and the paper from the sheathing in the vicinity. Then, with four strips of a chalk line, Tom marks out the position of the dormer opening. He cuts through the roof sheathing with a circular saw and serves the rafters with a reciprocating saw. To preserve the roof's structural integrity and support the dormer around the opening, he adds double-braces to the upper and lower edges and fastens additional, horizontal corner braces (CMB) vertical to the corner rafters that show up the sides. (See "A Matter of Detail: Dormer Framing," page 78.) "Whenever you cut into the roof of a roof, you've got to put it back somewhere else," Tom explains. Finally, he installs 2x6 end walls for the dormer's sides—the chertis—and hangs 2x6 LVL rafters from metal brackets on the window heads. Plugging the rafters, instead of nailing them on top of the heads, enables him to install a rafter window without reducing the dormer's roof pitch.

APPLYING A WATERPROOF MEMBRANE

"If the house ever blew off its foundation in a storm and landed upside down in the harbor, it'd float like a boat," says timber Mark Malloy as he straddles the peak of the roof on a breezy September day. He's only half joking. Every inch of the roof is clad in a wet-two-black-plus waterproof bituminous membrane to create [on one side] that it seals itself around penetrating nails and seals itself together at overlapped seams. Many rafters lay the waxy, ½-inch-thick material only a long ways to prevent ice dams, but Tom wants the extra quantity of total coverage. "Because we're so close to the ocean here, we get wind-blown, horizontal rain, which can penetrate under the shingles," he says. "But water can't get past this stuff, even with the cheapest roofing nails driven through it."

Tom had all the old shed sheathing ripped off, then replaced it with sheets of ½-inch plywood so that Malloy and his crew members, Jason Williams, would have a genuine surface for adhering the new house's 1-foot-wide rolls. Starting at the eaves, Malloy and Williams roll out a length of the material, strip off its protective plastic backing, and press it against the plywood, where it sticks like chewing gum to heat. The pair works their way up the roof, overlapping each row by 3 inches and they reach the ridge. Where the main roof meets a dormer's

ridge, the rafters of the shed dormer and the rafters of the main roof are joined at about 90 degrees. Because an L-shaped membrane is used, before laying down the waterproofing, the crew dammed up the ridge with a 2x4 beam to keep them in place. Then they laid the waterproofing, the joint should be as good as one made with a metal flashing.



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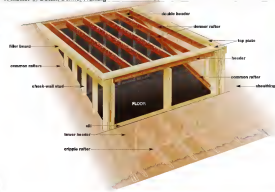
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SUBURBAN



LIKE A ROCK

A Matter of Detail: Dormer Framing



vertical walk, they fold the membrane at the corner and run it 4 to 10 inches up the wall. "Chaps cut membranes for leaking," says Mulloy. "But imagine anything interesting or penetrates a roof, whether it's a wall, a chimney, or a plumbing vent, you have to take special care. Using this membrane solves a lot of problems."

As good as the material is at keeping out water, it does have an Achilles' heel: sunlight. "UV rays will eventually break down the membrane if it's exposed to sun," says Mulloy. The shingles protect it from the sun on the wide, flat runs, metal flashing integrates the edges and intersections.

LAYING WOOD SHINGLES

Ever since Manchesters' heyday in the 1870s, the town's grand (and not so grand) houses have sported roofs and walls covered with red cedar shingles. Naturally durable and visually appealing, the material was the best in the available against outside weather. But even with regular maintenance, such roofs had a life expectancy of about 25 to 30 years, after which time the laborious and very expensive process of installing a new roof had to start anew. Given how advanced the McCart was about getting a new wood roof, how laborious they were to regularly sweep it clean, Tom ordered bundles of shingles cut to fit from pressure-treated southern yellow pine (see "A Shingles Replacement," page 88). This

is maintenance product, 24 inches long and between 3 and 5 inches wide, in the same wood used for shakes, decking, and below ground framing. "The best thing about these shingles is that they're transferable materials," says Tom.

The manufacturer says the shingles can be installed directly on top of sheathing, but Tom knows from experience that venting the underside of wood shingles allows them to dry faster and adds to their longevity. So he has Mulloy install a 1/2-inch-thick metal mesh over the entire roof membrane. A 1/2-inch-thick mat of loosely woven nylon. The course, open weave of the meshing allows air to circulate up, down, and across the roof, so that any water that finds its way beneath the wood shingles will rapidly evaporate. Finally, the roof is ready for the pack's installation.

Mulloy firm takes a 24-foot aluminum straightedge at the time to serve as a guide for shingling the entire course. As he or she can set the shingles side by side with the butt ends on the straightedge, Mulloy follows behind with a pneumatic gun, driving in 7d nails into a 1/2-inch-thick cork, two to a shingle, 3 inch from each side and 5 inches up from the butt. To give the roof a truly, more urban and edge, Mulloy frames a second course directly on top of the first one, overlapping the joints.

With the main course finished, Mulloy moves the straightedge 7 inches up the roof, keeping it parallel to the eaves, the next one:



Before any shingles are laid, Tom Mulloy covers the roof sheathing with a waterproof membrane, taking care to help any joints across the eaves of the roof, especially where the dormer meets the roof.

Before morning, on the roof, Mulloy worked in his shop to bend the flashing into various V and W shapes with a metal bender so that on the job site he could join with the appearance one and keep going. On the front edge of the dormer, beneath the weather, he placed the base flashing, one V-shaped piece that runs across the entire width of the joint. It inches up the dormer face and 5 inches down and out onto the roof. Along the dormer cheeks, he fits top flashing, 3-inch-wide by 5-inch-long rectangles, bent lengthwise into right angle Vs. Starting at the base of the dormer and working upward, Mulloy weaves the top flash-

ing around the last shingle in each course so that metal overlaps are coarse, then overlaps (and hidden) by the eave. (See "A Matter of Detail: Flashing," page 90.) He nails each piece to the roof, put once, about 12 inches below its top edge, with the same 7d stainless steel nails he used on the shingles. This layered system of shingle, flashing, shingle, flashing makes the

whole length of the chink to roof interface weatherproof. Once all the top flashing is tucked neatly between shingles, Mulloy overlaps the exposed metal on the cheek with a second layer of zinc base that Tom will cover later when he shingles the dormer cheeks. "Any water that gets under a roof or sidewall shingle will run onto the top flashing and out on the roof, rather

than down off, where abouts down. As they work, the pair are careful to stagger their joints, keeping the spaces between shingles at least 1/8 inches to either side of those in the previous two courses. "On a wood roof, you can't let the joints fall directly above the ones in either of the last two courses," says Mulloy. "Any closer than that, and that's a chance for water to infiltrate." Every few rows, he and Williams measure from the butt of the last course to the edge of the roof at both ends. If there's a difference between the two measurements, they adjust the exposure out or slightly in the next course so the shingles will meet in a parallel line at the top.

FLASHING

Whenever Mulloy makes a dormer chink, a chimney, or a valley where two roof planes meet, he handles the junction with metal flashing. "Don't get me wrong," he says, "I think the best waterproof membrane is a great product. But people get into trouble when they use it as their only means of diverting water." For this job, he's using 20-mil-thick lead-coated copper. The soft grey lead softens the shape of bright copper and prevents it from oxidizing and possibly staining everything with its runoff.

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Double-thick lead-coated copper protects every corner that water flows down, so it's not a matter of if, but when it rains, the roof will hold.

A SINGULAR REPLACEMENT: SOUTHERN YELLOW PINE

When the McDoug's house was built in 1983, the roof was covered with finely textured and weathered western red cedar. But by the time Janet and David bought the place, the top of the house sported flat, deteriorating asphalt shingles—about as suitable to the Shingle style as a hotlink is a salmon gift.

Instead of restoring the old cedar to the roof, the McDoug's chose to install shingles in the 47 pressure-treated southern yellow pine. Manufacturers sell the 16-inch-wide shingles from 25- to 30-year-warranty grades down, then regrade the pine with chemicals that ward off fungal decay and rot of heartwoods. This allows the manufacturer to offer a 30-year warranty with the product—30 years longer than the 15-year-warranty cedar shingle. It also means that, unlike cedar, the pine doesn't require periodic treatments or keep rot-free looking good. "With the long warranty and low maintenance, pine was a good option, especially since this house is near water," says Tom Zille.

The shingles do have to be sheathed. The pressure-treated process uses chromated copper arsenate (CCA), which contains

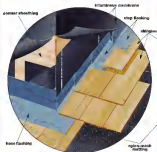
arsenic and chromium. The manufacturer also offers more in making board exclusively preservative—a shingle treated with more borate ammoniated copper quaternary (ACQ) that costs 10 percent more.

Faster used in sheathing the size of a cedar shingle with a more and a snap might be the best fit by the manufacturer. "Each cut by the manufacturer installation has to be made of the same size," says Mark Mallory, who installed the on the steeply pitched roof. Moreover, the pine only comes in 3- to 6-inch widths (cedar runs to 12 inches), making it more than necessary to stagger the joints between courses. "There's definitely a learning curve," says Mallory. As a result, though the two materials cost about the same, pine can jack up the labor bill by more than 15 percent. Finally, while cedar is commonly known for its durability and more than 100 years of fine-grained red cedar cut from the heart is a centuries-old tree. So after a few years of weathering, a pine shingle may look more rustic than one made of cedar, but that suits the McDoug just fine. —Dan DeHaven



A Matter of Detail: Flashing

ROOF-TO DOWNSPOUT CONNECTION



IN ROOF VALLEYS



PHOTOS: AND PHOTOGRAPHY BY JAMES H. HARRIS



Mallory says that a piece of lead coated copper pipe flashing is used for the vulnerable joint between chimney and roof. The flashing will be hidden by another shingle. It is in the gap the roof's edges with shingles. It is in the gap the roof's edges with shingles. It is in the gap the roof's edges with shingles.

To project on the chimney

that runs the building," says Mallory.

When two planes of the roof meet and form a valley, Mallory lays flashing bent into a slightly curved, 18-inch-wide W shape. The W shape runs along the left and right side of the W, and is placed on each side of the roof in channel courses as it flows down the roof. The small curved V between these two planes means that water always runs down one side of the flashing and up the other. Just "A Matter of Detail" (David Mallory, page 18) Mallory says the flashing's edges with two more overlapping strips of membrane on each side. When he reaches a valley with a course of shingles, he covers the flashing in with 24 inches of membrane, with the edges of the shingles cut parallel to this line.

The house's chimneys are flashed in much the same manner as the downspout, with step and base flashing. Mallory overlaps the base flashing—pieces of L-shaped lead coated copper mortared into the brick's joints and folded down over the step—instead of membrane. But on the side of the chimney that faces the path, where masonry and roofing may see to form in same angle, water can puddle and

leaves can collect, moving out and in. So there's where he places a cricket, a small, peaked plywood roof that directs water and debris to either side of the chimney and down the roof. (See Ash Nott, "Save the Chimney," June 2001, page 54.) "Eighty percent of the calls I get about leaking roofs concern a chimney that's not properly flashed," Mallory says. He covers the cricket with a wide sheet of lead coated copper that runs 6 inches up the face of the brick—overlapped by counter flashing—and 18 inches out onto the roof at the sides and back of the cricket.

When the shingle courses are all in, Mallory finishes the job by capping the ridges of the roof. Here he uses pairs of shingles, nailed edge to face like a tiny wooden roof, and overlaps them as he has on the other courses. In a few months' time, the yellow green shingles will weather to match the flashing, and the inside of the house will stay dry despite the battering winds, sleet, rain, and snow of winter. ■





IMAGINATION AND HARD WORK SPARK THE DRAMATIC TRANSFORMATION OF A FIREHOUSE INTO A HOME

BY RYAN ROBBINS

Built in 1863, and expanded 15 years later, Kingston, New York's Cornell Firehouse served as both a headquarters for local firefighters and as the village meeting hall. The building was decommissioned in 1972, although it continued to be used as a voting station and repair shop for the city. By the time the Dijk family—Hendrik, Maria, and their sons, Spoor, 13, and Raphael, 11—won the house at a city auction for \$16,000, the structure had been humbled and crumbling by a quarter-century of water leaks and neglect.

"As soon as we started to visit the floors, you could smell the horse urine rising out of the heart pine, even though horse-drawn fire wagons hadn't been used since the late 1800s," says Hendrik, an artist. But instead of dwelling on the building's negatives—fading roof, rotted floors, and outdated systems—the Dijks focused on the positives: 4,000 square feet of light-filled work and living space perched above Rondout Creek, festively laid, almost mortarless "spaghetti masonry," and fine details like tin ceilings and ornate plaster picture rails.

Although they hired subcontractors to restore the brick, to run plumbing and electrical lines, and to install two new gas furnaces, the Dijks preserved the majority of the old building—and its character—themselves.

Three busy years later, Hendrik's painting studio and school occupies half of the first floor where the hay crib once stood, while Maria's wholesale flower shop, with dried statice and roses hanging from the heating pipes, fills the other half. And the entire upstairs, once the domain of Good Intent Engine Company No. 3, has been repast as the Dijks' modern 3-bedroom, 2-bath home.



The restored fire station (19,200 sq. ft.) now houses artist Hendrik Dijk's family and his painting workshop. At left: Dijk and his wife, Maria, in 2011. Hendrik is not the first occupant of the building: until an auction in 1972, the Cornell Motor Company (pictured) as 1,115 sq. ft. occupied its "diamond-vent" roof, while cars, and later trucks, were stored in the "diamond-vent" roof. At right: Hendrik's workshop.



PHOTOGRAPHS BY JOSHUA MCHUGH STYLED BY MARY SCOTT HIMER

dijk/plugging leaks

The Italian-style Cornell Fire house—with its tall doors and windows, brownstone arches, pressed roof beams, and mossed metal bell tower—plays a central role in Kingston's National Register-listed Dutchess-Water Street Historic district. The building's asymmetrical first-story facade is the result of an 1886 renovation, when two of its three identical bays were retrofitted to accommodate the city's newest firefighting apparatus—a steam engine. Although outfitted with a wooden overhead door when the Dijk acquired the station, the garage, Hendrik guessed, once had doors similar to just that tall hoist in the optician to the backyard. He saw there is a model to create new 95-foot-tall, wrap



hinged double doors, with frames of Douglas fir and salvaged 3-inch-wide western bottom panels; the upper panels and transom lights are glazed with antique antique glass to match the old heavy glass of the second-floor windows. Hendrik also rebuilt the deeply rafter-arched doors on the facade's right side, copying details from a 1870 photograph of the firehouse. He was able to save a few feet

ABOVE: The firehouse's perpetually neglected and shaggy Italian gables—built into the hip roof surface instead of being on the exterior—led to the steady deterioration of the firehouse's masonry facade. Most critically, the pillars on the right side began to pull away from the exterior wall. Hendrik drilled through the masonry and into the house in four places, then used 20-inch threaded rods, drilled an inch and, because it, he prevented further decay by covering the old gables with aluminum flashing and cementing the interior beams, then drilled straight up to also patch the bell tower and downspouts.

BELOW LEFT: Masons replaced the brick and replaced the weather-resistant masonry with the masonry with concrete block and mortar.

BELOW CENTER: After the masonry was stabilized, Hendrik replaced the steel rods and washed the facade to remove a coat of institutional green paint. He also rebuilt the brick gable's lowered masonry,

of original hand-carved rope molding, one of his remaining projects is to replace 38 or so additional feet of masonry that he removed all three from doors.

Around the time the steam engine arrived, the building also got a fire for when it came—a rooftop bell tower. Self technically owned by the city, an 1884-1885 bell—named "McNulty Bell Company, Troy, N.Y., USA, 1885"—is an oddity: one of the Dijk's, the bell tower, with its unadorned steel of the quarter Kingston-Fair Haven 1921 suspension bridge, can now be easily reached through an attic hallway. But Hendrik's fireproof the roof was damaged by 25 years' worth of pigeon guano—eight purple bags full—which ultimately led to the building's decay. Once on top, he put down a new plywood deck, replaced much of the tower's decayed cedar framing with pine, rose all its rotted asphalt shingles to reveal the rafters, and repaired the masonry details. He also polished the bell with synthetic scoring pads. On the evening of January 1, 2000, the Dijk family climbed the bell tower and rang as their new house along with the 21st century.

and visited the utility company to relocate the electrical service and enter to a less conspicuous spot at the corner of the building. **BELOW RIGHT:** New exterior construction was needed to add a window on a side wall for the roof's roof. Hendrik added into the brick with a cut-off saw equipped with a 12-inch diamond-bit masonry blade and drilled the rough opening with a masonry hammer and brick chisel. **OPPOSITE PAGE:** After adding rafters from the two north with both 4x10s mounted and installed wire brackles, Hendrik coated the masonry with metal primer, followed by two layers of weather-resistant butyl rubber. [He acknowledges that coating a surface rather during the process would have been nice.] Covering the approximately 2,600 square feet of roof required nearly 60 gallons of the material. "We've got thousands of dollars invested up there," says Hendrik, "and demolition, we're sitting on shantytown masonry."



And a building at
for a high school
you can easily spot the bell tower
above the old firehouse building.



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GRAB LIFE BY THE HORNS

A close-up photograph of the front of a Dodge Ram truck. The focus is on the large, chrome-trimmed grille with a honeycomb mesh pattern. Numerous dead insects, including flies and beetles, are stuck to the grille. To the left, a portion of a round headlight is visible. The background is dark and out of focus.

**SOME BUGS DIE
MORE NOBLE
DEATHS THAN OTHERS.**

dijk/character rebuilding



BOTTOM Many of the farmhouse's wallpapered ceilings, including that of the master bed (now the living room), were covered at the end of the 19th century with pressed tin. The product was popular as both a fire-resistant material and a stylish yet economical alternative to more expensive plaster medallions and moldings. "We were determined to save the mold," says Hendrik, "even though it was placed as if it were a thin layer of paper." They resorted to chiseling planks from the boys' bedrooms and stairs (which they plastered over) to patch the ceilings of the living room, kitchen, hallway, and master suite. **TOP LEFT:** Four different panels make up the eventful pattern, including 2-by-3-foot tiled tiles and arched corner pieces. **MIDDLE LEFT:** Once all of the sections were in place, Hendrik prepped them by sanding back with a steel-mounted rotating wire brush, then spraying the ceiling with two coats of white metal primer. **TOP RIGHT:** After caulking the seams, he applied two coats of flat white latex paint and a finish coat of semi-transparent paintless epoxy in the living room and master suite and oil in the kitchen and hall. A friend of the Dijk's, Yoni Orensky, helped Hendrik finalize the leaded glass transoms (light over the hall door). **OPPOSITE PAGE:** The living room's 8-inch-wide, 3-inch-thick strip oak flooring also required attention. An old floor running

had left behind a gummy black layer of adhesive. To remove the material, Hendrik used xylene—a potent solvent—and a carbide-steel scraper. He then sanded the floor flat three times in succession with 20-, 40-, 60-, and 100-grit belts and finished it with a dose of oil-based wood conditioner, a frictioned stain, and three coats of polyurethane. The living room's restored 180-year-old ceiling, windows, and floor frame Hendrik's recent patting. **OPPOSITE PAGE**



"I cannot imagine living in a new house with no character," says Hendrik. "Even in an old one, if you strip out too much, you kill the spirit." He stuck to this philosophy as he revamped the second story, recycling old radiators and reusing original moldings as new partitions, walls, windows, and doorways. One such door connects the previously discrete rear and west sides of the farmhouse's second floor. He also punched a kitchen-to-dining area pass-through in the rear wall. From a living room vantage point, one can look through and see all three of the facade's grand tripartite windows.

Most importantly, Hendrik added a convenient central staircase,

which ascends from a foyer to the large living room upstairs, replacing two old rickety flights inefficiently tucked into the rear corners of the farmhouse. He ensured that the stairs will stay quiet by bedding them in silicone caulk—smart thinking in a household with two energetic sons. But he gave the new set a period feel by attaching the half-well at the top to a wainscot salvaged from the four-floor crutch. He also preserved a similarly wainscoted former's coat locker in the hallway to house the winter and dryer. And in the kitchen, he caulked attached secondhand cabinets and a porcelainized cast iron sink that he spliced around like a turtle on the edge of the road.



dijk/sleeping quarters

A 1941 fireman's conversion program began about the Carroll Firehouse's well-appointed dormitories. "On the upper floor is the rear facing the beautiful Hudson River, there are beds for sleeping and a dining pole, and as soon as the alarm is sent in it takes but a minute for everything to be on the way to the fire," Hordick now has reason to stray from this historic procedure, he located the master bedroom suite in the same spot. Although the pole was

removed before the Dijs purchased the building, the couple added a new cast-iron spiral staircase to a balcony off the second floor hallway, ensuring that they can reach to the back porch's line of view on a mother's notice. A small bathroom used to start draining outside the bedroom to the master bath. The shower and vanity are illuminated by a 28-foot tall skylight-covered shaft—the space where the fireman hang the hoses to dry. ■

TOP LEFT: Hordick's first step in converting the fireman's dormitory into a master bedroom was taking off a staircase from the first floor. He extended the existing joists to meet the wall by staining them with leg bolts and 2x12s, then added 1x4s plywood to bring it flush with the new exterior siding plate floors. **MIDDLE LEFT:** Over all of this he laid new 8-inch-wide yellow pine, he treated the wood with an oil-based conditioner before breaking on a pickling solution of 8 parts white oil stain to 1 part purple. He finished the floor with 3 coats of eggshell polyurethane. **BOTTOM LEFT:** The wall and picture rail's mottled appearance is the result of Hordick's painstaking paint removal work via wire brush and 8-inch square bits. **ABOVE:** These large windows illustrate the best work Hordick replaced the original aluminum windows with larger 75-by-36-inch low-overhead, framing them with simple, white trim and half-round window sills.

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The heat and humidity have reached their summer peak on this steamy day in Atlanta, and for what seems like

the first time since the foundation walls were poured, *This Old House's* Timeless Home is quiet. Yet important work is still going on in the basement, where electrician David O'Brien crouches, silently feeding a 14-gauge plastic-insulated cable into the back of an outlet box. All around him, thin strands of white cable snake through the exposed studs and hang from the joists like overgrown vines. This box, the tenth one he's roughed in today, is now ready for the day when the walls and ceilings will be finished and the wires can be connected to switches, receptacles, and light fixtures. He has 27 more such boxes to complete on this floor alone, and enough work to keep him and his boss, William Just, busy for two solid weeks. "The real difficulty at this stage is locating everything where the architect wants it," he explains. "And now that the plumbing and ductwork are in place, the job is even harder."

While the rough-in stage—executed after the framing is done and before the drywall goes up—seems to be a relatively quiet period, this is when all the hidden components of a house's electrical, plumbing, and heating and cooling systems are installed. It's demanding work, requiring specialized contractors who know the code and safety requirements, who know

codebook, how the electrician's heating and air-conditioning ducts run out of a door wall and between the rafters in the space-restricted second floor. A sub-and-drum cable stand crouches nearby, ready to use one of the house's seven bulkheads. An HVAC unit is visible in the distance. Wiring for the house's electrical system spreads from one of the two main electrical panels in the basement.





how to maximize a system's performance, who don't put obstacles in the way of the mechanics, and who, despite the highly repetitive nature of such tasks, do every step right every time. (Anything that gets wrong after that point is difficult and costly to fix.) But for anyone who values living as a home with safe electrical power, clean flowing water, and a comfortable indoor air environment, it will work.

At the Tinsley Home, a joint project between This Old House magazine and the Masco Corporation (a supplier of building materials), planning for the rough-in phase started long before the foundation was poured. Plumbing contractor Michael McWood and lead plumber Joe Addicks visited the site and surveyed the architectural drawings to determine how best to meet the demand for water in the house's five full baths, two half baths and two kitchens. For example, the shower in the master bath—with its main showerhead and six body sprays, three aimed at the lower back and three at shoulder height—would use about 12 gallons of water per minute.

Concerned that simultaneous demands from faucets and showerheads might run the electrical system into ineffective dribbles,

McWood and Addicks calculated that the tube connecting the house to the city's main water supply needed to be 3 inch in diam. (or rather than 1/2 inch), enough to accommodate a higher-than-average flow. "It's amazing how much more water you get when you up the water-main size just a quarter inch," Addicks says. "But we also note what size pipe we put in, there might as well be some pressure lost if all the showers in the house are on simultaneously." The plumbing crew laid the 3-inch water line—a single piece of flexible polyethylene pipe—as a 100-foot-long, 11-foot-deep trench that stretched from the street to the basement wall

187 The color on a pressure-reducing valve on the 3-inch water supply line gets a final tightening. 188 Joe Addicks adds a second floor Addicks's supply lines enter a 10-inch single female valve for a full-and-shower combination.

next to the front door. A 3/4-inch PVC sleeve embedded in the concrete served as the pipe's armor to the inside of the house.

All that was left to do was to go back out, so the crew dug another trench for a 4-inch PVC sleeve that extended from the street pipe at the street to a point beneath the basement slab. Before the foundation contractors started their pour, they bored a 4-inch PVC sleeve through the footing for the drainage to be fed into. Fortunately, the basement's 8-foot elevation above the street made possible a gravity-fed drain, rather than one that relied on pumps. "This is one time when being up on the hill paid off," says builder Jesse Yonell.

Four months later, when the house had been framed, Addicks was back on-site to install its network of copper supply lines and PVC drains. Starting at the main supply line, he snatched a pressure-reducing valve to bring the city's 110-psi (pounds per square inch) water pressure down to a moderate 65 psi for household use. Next, he soldered two copper tee fittings into its end, dividing the incoming water into three branches—one for cold water, the remaining two to feed each of the 50-

gallon gas-fired water heaters. One heater will supply the basement kitchen, the master bathroom, and two of the bathrooms on the second floor; the other will serve the full and half baths in the basement, the kitchen and the half bath on the first floor, and the first full bath on the second floor. In the basement, Addicks threaded the hot and cold copper supply lines through the framing, a tedious process that required him to drill a series of horizontal holes through the 2x10 joists under the first floor. The parallel hot and cold lines for the first and second floors ascended into the roof bays in the master bath, the

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kitchen, and the half bath went to the east wing.

For the summer design, Adams used 3-inch PVC. The fact that most of the first- and second-floor features lie close to the same vertical plane simplified this work, as individual ducts all touched off one line, or "trunk," at irregularly placed T-joints. But because the kitchen is not far away from those plastered rooms, it has an over 2-inch drop, which puts the other one at the 4-inch main duct leading to the street.

There's no mystery about who considers a quality plumbing job, or how to achieve it. As long as soldered joints don't leak, drains don't clog, and showerheads spray hot water with satisfying force, we're happy. Our needs are put in clear-cut when it comes to forced air heating and cooling. We like even temperatures, moderate humidity, and no drafts. For achieving this balanced state isn't so easy. The always changing outdoor temperatures and humidity levels—due to moisture the sun shining through the windows and heating down on the roof—all compete to keep indoor air in a constant state of flux. That's why contractors who work with heating, ventilation, and air-conditioning (HVAC) systems turn to computer software to help manage the complexities of maintaining indoor environments.

EVINC subcontractor Ron Jones generally uses an early program to calculate the heat loss and gain for the most basic houses he normally works on. "I enter the size of the house in square feet, the R-value of the insulation, the total window area, and the distance the house faces, and the program tells me how big a furnace and compressor can handle the heating and cooling load," he says. But he knows that no matter what the program told him, one furnace would not be able to comfortably heat and cool the sep-



Right: Johnson's duct (top) carries air to and from the basement furnace. Wire-reinforced flexible plastic ducts carry the same purpose for a 25-ton electric heat pump installed behind a base wall on the second floor (left). A number of HVAC contractors Ron Jones came for the aid of a flexible ducts on a run on the second floor (center).

experience in this trade, Jones decided to divide the house into three zones, each with its own forced air heating and cooling system (see discussion on page 54). This 3-system setup will consume more electricity than a single furnace, he admits, but he's certain it will keep the house more comfortable all year round.

An 88,000-btu gas furnace and a 3-ton (36,000-btu) air-conditioning compressor service one zone covering half of the basement and the half of the first floor above it, no shared furnace and a 25-ton (30,000-btu) compressor take care of the other half of these two floors. The third system—a 15-kilowatt electric heat pump to go with another 24-ton (30,000-btu) compressor—others and cools the second floor. Both furnaces are located in the basement. The heat pump sits on the second floor behind a base wall. All three compressors are outside the garage. The cooling capacity of these compressors was calculated to take into account the high levels of humidity during Adams' summer. "You want them to be able to circulate enough air through the interior coils in the air handler in order to bring the moisture out of the air, rather than cool the air quickly and then shut down," says Jones. Both the heat pump and the air-conditioning units have a seasonal energy efficiency rating (SEER) of 12 (28 percent more efficient than the 16 SEER required by federal law), and the two furnaces have an annual fuel utilization efficiency (AFUE) rating of 90 percent (30 percent higher than the national standard). "It's the highest rating you can get," says Jones. All three systems have a digital thermostat, a 17-gallon capacity humidifier (for the dry winter months), and a high efficiency media filter that can remove 95 percent of the pollen, mold, spores, and dust over 1 micron flowing through the system ducts.

Forcing air to the ductwork that carries air to and from the rooms in the basement was a straightforward task. Jones screwed together sections of round, galvanized "hard pipe," some up to 14 inches in diameter, fitted them between studs and joists with metal-strap webbing, sealed all the joints with mastic, and wrapped everything in 5-5.8 fiberglass insulation. "We're on

the second floor proved more challenging. With no work available, Jones' crew installed the heat pump and ducted flexible 8- or 14-inch ductwork with reinforced flexible plastic ductwork in the rooms and between the rooms. Jones even had the ductwork enter window seats in the master bedrooms to give him a place to run his ducts.

All the ductwork had to supply vents as large as 12 by 12 inches (as many as three per room) and 14-by-6 inch screens (generally one per room), which are vents that remove the smoke so help circulate the good air. For optimum performance, Jones located them as close as possible to outside walls, and made sure the ducts leading to them were as straight as possible. In the master bedroom, for instance, he positioned one return and two supply vents in the floor, that way the ductwork only had to make one 90-degree turn as it came up from the basement. "The fewer the turns, the less you're restricting the air flow," Jones says. He did not, however, place any screens in the bedrooms or kitchen. "You don't want to send smells throughout the house," he explains.

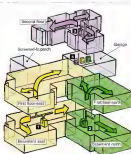
Once the HVAC and plumbing systems had been installed, electricians William Just and David O'Brien could start their rough-in work for all the switches, outlets, ceiling fans and lights, and appliances.

First, to make sure the basement enough power to run the heating and cooling systems, the appliances, and the large number of light

General contractor James Threlkeld checks the circuit breaker on one of the two 200-amp electrical panels.

IN THE ZONE

Basement of the Timorous House's second layout, HVAC contractor Ray Jones decided that the best way to heat and cool the house was to install three separate systems, each with its own digital thermostat, gas furnace (or electric heat pump), and compressor. The furnace in the east end of the basement (1) supplies air to the basement kitchen, bathroom, and media room as well as a portion of the first floor, including the living and dining rooms, the kitchen, and the mudroom. The furnace in the north end of the basement (2) services the rest of the basement and the master bedroom and home office on the first floor. Jones installed an electric heat pump heated a heat wall on the second floor (3) to heat and cool the bedrooms there. Each of the three systems is powered by a compressor located behind the garage (4).



fixtures that the architect, Brennan Eide, had drawn into the plan, they connected two main cables from the utility lines on the street to two 200-amp, 40-circuit panels in the basement. Getting each 1½-inch-diameter cable to the basement from the electric meter on the side of the garage took some doing. The men had to lead them up to the second floor above the garage, through holes in the I-joints over to the mudrooms, then down again into the basement.

"These cables don't bend easily and there were lots of beams to go around," Just says. By comparison, threading the 6,500 feet of 14-gauge plastic-insulated wiring through the house was a walk in the park. The crew crawled over the wire routes for the furnaces and marked out the locations for outlets and switches on the walls, making sure they were 6 feet from every door, 12 feet apart throughout any given room. The code even dictates where they had to drill holes through studs. "You need at least 1½ inches of clearance from the outside of the stud so the dry-wall wouldn't crack a nail or screw into the wire," Just says.

In the house, each cable is connected to at least one wall switch, requiring Just to use 4-wire cable instead of the usual 3-wire variety. "I used all outlets like this and so all the wires are the ones that won't be switched," says Just. "That gives homeowners the option to make the other outlets switched as well if the furnace comes." And then, after a pause, he adds, "It's much easier to do it that way now than try to change it later." ■

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BY GAIL KIRK
AND KATHLEEN O'NEAL
ILLUSTRATION BY J. HYSLOP SMITH

For Vicki Rogers and her family in Concord, Massachusetts, it wouldn't be Christmas without the massive 8-foot, cut Colorado blue spruce standing majestically in the living room, swathed in the popcorn-and-cranberry chains that she and her children string together. But last December, she and her husband, Tom, started another tradition: They got a live, 4-foot Fraser fir in their home's foyer as a secondary decoration, then planted it in their backyard after Christmas. "We placed it right next to the kids' playhouse," says Vicki. The Evermans are following suit again this year, so that eventually, each of their three daughters—ages 7, 10, and 11—will have her own tree to decorate outdoors.

While building memories, the family is establishing an evergreen legacy that will grow flowers for many years to come. Using landscape plants bought at a nursery or mother-in-law is a typical cut tree, or, like the Evermans, in addition to one, is a growing, pulchre second. Nurseries, 5 to 7 percent of the \$2.4 billion trees sold last holiday season were living varieties, compares the National Christmas Tree Association. And while the idea has been around for more than a decade, live evergreens have become ever more popular in recent years, thanks largely to the marketing efforts of growers and home-garden centers. "For a little more money than a cut Christmas tree, you're getting a valuable landscape product," says Steve Menhardt, an Alabama tree farmer whose holiday sales have grown fivefold in the last six years. Of the 1,000 living trees he sells annually at Christmas, more are Leyland cypresses, which cost about \$49 wholesale for a 60-foot tree in a container.

The trend originated with environmental advocates seeking an alternative to the cycle of raising, cutting, trading, and discarding commercially grown trees. And while even live-tree proponents acknowledge that some of the ecological benefits are more perceived than real—cut trees are a crop, and farmers replace what they harvest—as Christmas trees, living varieties offer several advantages. First, they eliminate the sometimes frustrating risk of attaching a cut tree to a wobbly stand, leaving the soil-filled container or burlap-wrapped root ball, an inside job or pox, keep the tree firmly upright. Second, the process of transplanting adds a special dimension to the holiday, especially for kids. Once in the ground, the trees provide year-round benefits: ornamental beauty that low-maintenance, a natural screen against wind and neighbors, and cover and food for wildlife.

For those who are fond of a traditional covering cut pine or balsam, a live tree may require some compromise, says Rip Anderson, the gardener on the PBS television show *The Victory Garden*. Anderson chose the Emerson' Fraser fir, at a cost of \$61, and helped these plants (see next page) flourish, he says, think small. Living trees are heavy—a 6-foot variety in a 15-gallon container of soil weighs

about 200 pounds. "Any bigger and you'd need a crane to get it into your living room," he says. He likes 4-foot species, which are easier to deal with. He also recommends that landscape evergreens spend no more than a week in so indoors—and preferably in a fairly cool room. "If you keep your house at seventy-five degrees, you're going to have a problem," he says. "The tree will think it's April or May and it could break dormancy, when that happens, it wants to produce new growth buds that won't survive outside in late December. That will kill the tree."

Depending on where you live, putting the new tree to the ground also poses some challenges. "It's not just a good time of year to be planting a tree in the North," says grower Menhardt. "But it can be done by planning ahead and digging the hole in November, before the ground freezes." You won't know exactly how big your tree's root ball will be, says Anderson, "but if you dig a hole about two feet in diameter and eighteen inches deep, you should be fine for a four-foot tree."

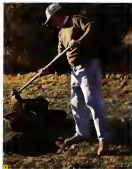
Anderson advises choosing a location carefully. Typical Christmas tree varieties such as white spruce and Colorado blue spruce can grow to 60 feet. Mocking snow and shading out grasses—something he's observed firsthand in two 4-foot spruce varieties planted at the Victory Garden 25 Christmas ago have now rammed into 40-footers. "A good spot is along a property line, away from the house," he says.

And be sure to pick a type of tree that's appropriate for your climate. Spruces and firs are well suited to the wintry Northeast, better choices in mild climates are certain varieties of cypress, cedar, and pine. Be aware that while fire-resistant varieties such as spruces and firs are naturally pyramidal, those with softer needles, including white pines and Douglas firs, may have been pruned to perfect Christmas tree shape, but characteristically take on a more irregular form in maturity. A reliable nursery will offer advice, as well as reference books and pictures of full-grown trees.

This year, the Evermans are choosing between a white spruce and a Colorado blue. "I really like the look of a spruce," says Vicki. "Hopefully, we'll be appreciating this tree for a long time."



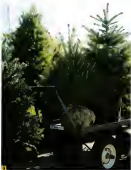
At a nursery, The Victory Garden's Rip Anderson examines balled-and-burlapped specimens that can be used in landscape plants after Christmas. He looks for needles that appear bright and springs and checks that the roots are well covered.



1) A week before Thanksgiving, Kap Anderson arrives at the Swarthout home in Concord, Massachusetts, armed as usual. He digs a hole roughly 2 feet in diameter and 18 inches deep, in preparation for the first tree that will eventually be planted there. Anderson puts the removed soil in plastic buckets and loads it into the garage, where it won't freeze. As a planting rule of thumb, the hole should be dug about the depth of the real tree and 1.5 to 2 times the diameter. "If you don't fence the hole a year later," says Anderson, "don't be afraid to dig a bigger hole. It won't hurt."

2) After lots of excited digging, he insulates the hole to keep its walls from freezing by stuffing it with a plastic bag full of fallen leaves. The last step of November preparation is a safety precaution: covering the hole with a sturdy board to prevent the possibility of someone tripping or tumbling in.

3) Just before Christmas, Anderson visits a local nursery. The store is offering three species of living evergreens: white spruce, Colorado blue spruce, and Fraser fir. He examines the trees for tradition; they should have a healthy green appearance and the needles should be flexible and not come off in the hand as you gently shake a branch. In addition, the real test should be well received. Anderson reads labels to verify the experience and check appropriate growing conditions. Finally, he chooses a 6-foot Fraser fir, praised for its robust fragrance and strong green needles. The tree's four-top-shaped real ball indicates it was grown in the ground and dug up for transplant, as opposed to being a container-grown variety. Either works fine as a Christmas tree.



4) Taking up a living Christmas tree is an ordeal as carrying it indoors and keeping it watered daily. To be in the tree relationship, before bringing it to the house Anderson covers the needles with an organic solution of pine oil suspended in water. The soil-to-transport treatment partially blocks the stomata, known as called stomata, through which the tree "respires." Both container-grown and field-and-outgrown varieties need to be placed in water-right vessels of a large capacity for a week before a heavy brass ball is stuck into the water column, the base, and the trunk. A decorative basket of Mistletoe completes the setup.

5) A week after Christmas, Anderson shows the tree to the guests before bringing it to the plant house. Knowing it's here for a day or two before the tree is to be sold, the yard is now frozen solid, but under a protective cover of snow, the tree is still healthy. He tells every tree he's taken around that it's not a Fraser fir, but a Fraser fir, and that the tree is in the house. "You want the yard where the tree is to be the best in the slightly higher than the other trees, because there will be no snow falling," he says.

6) Next Anderson shows the tree to the second house. "Bring it in with the tree and a good shovel, it's a good idea," he explains. He waters well—"really work it down," and then pushes with his foot and back. "The match helps get it with the tree in the soil temperature and water content," he says. "And, in the same way, you can get a simple tree planted in the spring, it should be watered regularly thereafter." Ignoring the biting cold at this time, January day, he stands back to admire his work. "In five years," he says proudly, "this should be an excellent tree."



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PHOTOGRAPH BY TOM GREENFIELD



After Steve inspected this first floor fireplace for masonry work—his job was second—the crew moved it to make way for the large kitchen.

Week 12 (December 4-12)

TCM crew took Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace.

Week 13 (December 6-14)

Northwest masonry specialist Fred Knapik, a local mason, visited the site to inspect the fireplace. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace.

Week 14 (December 15-16)

Steve and TCM prepped the fireplace and heating in Meteboron. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace.

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Week 15 (December 17-18)
Steve and TCM prepped the fireplace and heating in Meteboron. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace.

Week 16 (December 20-21)

After working on the fireplace and heating in Meteboron, Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace.

Week 18 (December 23-24)

Meteboron Steve took Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace.

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Week 19 (December 25-26)
Steve and TCM prepped the fireplace and heating in Meteboron. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace.

Week 20 (December 27-28)
Steve and TCM prepped the fireplace and heating in Meteboron. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace. Steve Puentes, western general contractor, Tom Shaw, chief of Meteboron project's masonry team, and a local electrician, David Lee, to a local utility. David Lee, a local electrician, took the crew to the local utility to inspect the first floor fireplace.



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save

THIS OLD HOUSE

BY RYAN HOGGINS

PRICE

\$9500

LOCATION

Newton, Kansas

William Bugh, an immigrant from Denmark, Kansas-born, built this distinctly American Prairie-style bungalow in 1914. The position was owner of the Newton Corcoran Works, at that time the area's largest manufacturing business, an apartment in the house's corner on a carriage and stables, metal gallery, leaded-glass windows, and, on the porch, a small, tightly sealed on line. This curiosity, which seems to the area, once possessed both Bugh's beloved Lemburger and his mental illness—his wife, Jeanette, preferred to keep her distance from the legendarily pungent cheese.

In 1918, the widowed Jeanette sold the 3,790-square-foot, two-story brick four square to Carl Hey, who had made his fortune as operator of the Newton Ice Cream Company. His older son, Jack, mostly neighbors gathering on the marble-floored front porch to watch basketball powerhouse Newton High School early after six victories.

After passing to a third owner, the house was acquired by Newton Unified School District 173, which used it as an administrative office from 1962 until December 2000. School officials renovated the kitchen and added several perimeter walls, two full baths, and a lot more. They continued to use the original materials and implemented the historical wing with surface-mounted ceiling boxes. The school board desires order for the new perfect preservation of such of the oak woodwork, from the lower's off-white ceiling and wide window trim to the dining room's built-in china cabinet and single-panel doors.

The site is now needed for a new educational facility, and if the Bugh house is not moved by then summer, it will be demolished. Also on the property are two old garages, which the new owner may salvage if desirable. Although the school board will pick up the tab for filling in the house's basement and foundation, it is requesting a small payment to help defray incident costs.



The Bugh house (left), with its wide eaves, thick porch columns, and tiled beyond roof, is a prime example of America's indigenous Prairie style. Arch and Frank Lloyd Wright pioneered the style in the 1900s. The study's practice oak book cases, fireplace surround, and leaded-glass windows (right left) and the window treatment (right right) are typical of the house's well-preserved exterior.

CONTACT

Gary Jantz
Native School District 173
(913) 284-4312

If you know of a house that should be saved, please write for *Save This Old House*, 1100 Avenue of the Americas, 40th floor, New York, NY 10020.

THIS HOUSE WAS BUILT BY WILLIAM BUGH, AN IMMIGRANT FROM DENMARK, KANSAS-BORN, WHO BUILT THIS DISTINCTLY AMERICAN PRAIRIE-STYLE BUNGALOW IN 1914. THE POSITION WAS OWNER OF THE NEWTON CORCORAN WORKS, AT THAT TIME THE AREA'S LARGEST MANUFACTURING BUSINESS, AN APARTMENT IN THE HOUSE'S CORNER ON A CARRIAGE AND STABLES, METAL GALLERY, LEADED-GLASS WINDOWS, AND, ON THE PORCH, A SMALL, TIGHTLY SEALED ON LINE. THIS CURIOSITY, WHICH SEEMS TO THE AREA, ONCE POSSESSED BOTH BUGH'S BELOVED LEMBURGER AND HIS MENTAL ILLNESS—HIS WIFE, JEANNETTE, PREFERRED TO KEEP HER DISTANCE FROM THE LEGENDARILY PUNGENT CHEESE. IN 1918, THE WIDOWED JEANNETTE SOLD THE 3,790-SQUARE-FOOT, TWO-STORY BRICK FOUR SQUARE TO CARL HEY, WHO HAD MADE HIS FORTUNE AS OPERATOR OF THE NEWTON ICE CREAM COMPANY. HIS OLDER SON, JACK, MOSTLY NEIGHBORS GATHERING ON THE MARBLE-FLOORED FRONT PORCH TO WATCH BASKETBALL POWERHOUSE NEWTON HIGH SCHOOL EARLY AFTER SIX VICTORIES. AFTER PASSING TO A THIRD OWNER, THE HOUSE WAS ACQUIRED BY NEWTON UNIFIED SCHOOL DISTRICT 173, WHICH USED IT AS AN ADMINISTRATIVE OFFICE FROM 1962 UNTIL DECEMBER 2000. SCHOOL OFFICIALS RENOVATED THE KITCHEN AND ADDED SEVERAL PERIMETER WALLS, TWO FULL BATHS, AND A LOT MORE. THEY CONTINUED TO USE THE ORIGINAL MATERIALS AND IMPLEMENTED THE HISTORICAL WING WITH SURFACE-MOUNTED CEILING BOXES. THE SCHOOL BOARD DESIRES ORDER FOR THE NEW PERFECT PRESERVATION OF SUCH OF THE OAK WOODWORK, FROM THE LOWER'S OFF-WHITE CEILING AND WIDE WINDOW TRIM TO THE DINING ROOM'S BUILT-IN CHINA CABINET AND SINGLE-PANEL DOORS. THE SITE IS NOW NEEDED FOR A NEW EDUCATIONAL FACILITY, AND IF THE BUGH HOUSE IS NOT MOVED BY THEN SUMMER, IT WILL BE DEMOLISHED. ALSO ON THE PROPERTY ARE TWO OLD GARAGES, WHICH THE NEW OWNER MAY SALVAGE IF DESIRABLE. ALTHOUGH THE SCHOOL BOARD WILL PICK UP THE TAB FOR FILLING IN THE HOUSE'S BASEMENT AND FOUNDATION, IT IS REQUESTING A SMALL PAYMENT TO HELP DEFRAID INCIDENT COSTS.

THE BEST THINGS IN LIFE ARE BASIC



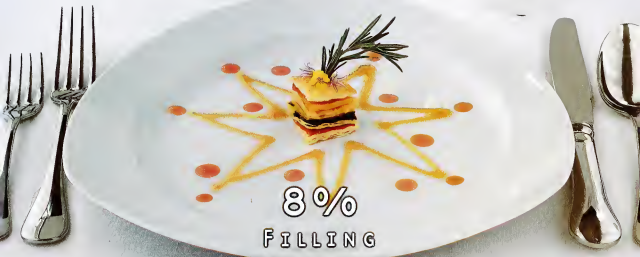
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