

Basement and Attic

Need more living space? Use this list to see if you have affordable options under your existing roof.

BY JERRI HOLAN

Perhaps you're wondering what it would take to make a real bedroom out of that attic space your teenager has monopolized. Or maybe you're curious if it's possible to transform the basement into the home office you've been dreaming of. You're not alone. Attic and basement conversions are two of the most popular remodeling projects for homeowners—and for good reason. Dollar for dollar, capturing existing space that already has floors, walls, and a roof can make more sense than building an addition.

An attic or basement might need only minor structural modifications and mechanical extensions to make the space habitable. By staying within a home's envelope, the character and scale of the original house are maintained, and valuable yard space is preserved. A not-so-apparent bonus of converting an attic or basement is the opportunity to improve existing conditions such as insufficient insulation, undersize structural components, and obsolete mechanical systems.

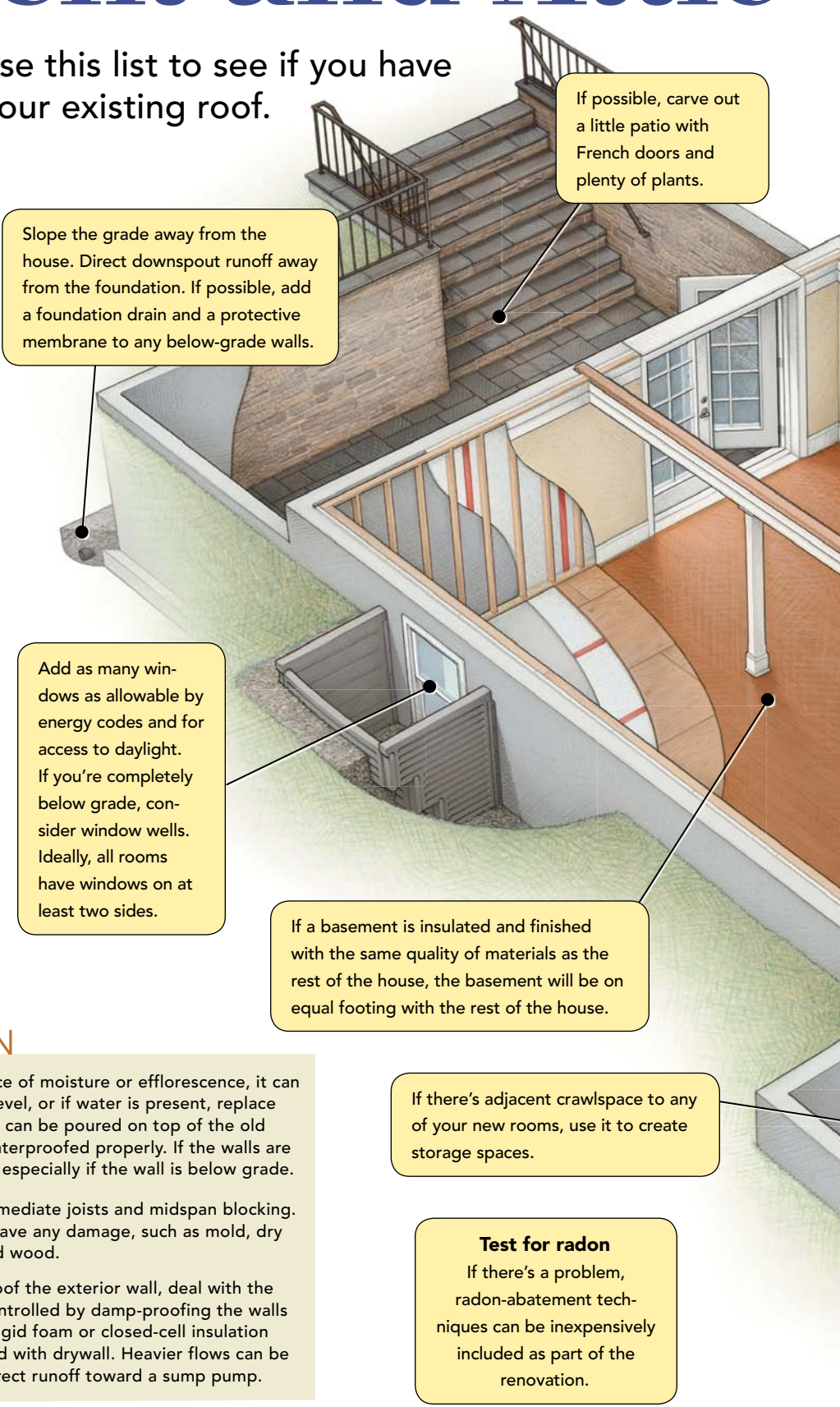
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STRUCTURAL EVALUATION

Basement Concrete If the existing floor shows no evidence of moisture or efflorescence, it can probably be reused. If it's old, cracked, or not level, or if water is present, replace it. If you have enough ceiling height, a new slab can be poured on top of the old one as long as the subgrade is prepared and waterproofed properly. If the walls are concrete, look for cracks and signs of moisture, especially if the wall is below grade.

Wood If the floor sags, strengthen it with intermediate joists and midspan blocking. If the walls are wood-framed, ascertain if they have any damage, such as mold, dry rot, or pest infestation, and replace all damaged wood.

Wet basement? If it's not possible to waterproof the exterior wall, deal with the water inside. Mild moisture problems can be controlled by damp-proofing the walls on the inside by covering them with a layer of rigid foam or closed-cell insulation followed by a pressure-treated stud wall finished with drywall. Heavier flows can be controlled by cutting channels in the floor to direct runoff toward a sump pump.



Slope the grade away from the house. Direct downspout runoff away from the foundation. If possible, add a foundation drain and a protective membrane to any below-grade walls.

If possible, carve out a little patio with French doors and plenty of plants.

Add as many windows as allowable by energy codes and for access to daylight. If you're completely below grade, consider window wells. Ideally, all rooms have windows on at least two sides.

If a basement is insulated and finished with the same quality of materials as the rest of the house, the basement will be on equal footing with the rest of the house.

If there's adjacent crawlspace to any of your new rooms, use it to create storage spaces.

Test for radon

If there's a problem, radon-abatement techniques can be inexpensively included as part of the renovation.

Remodel Checklist

A gas-fired direct-vent fireplace can counter the complaint about cold basements. A note of caution: Install a vented fireplace. Avoid the vent-free models.

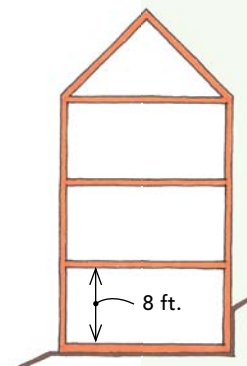
The basement stair should be near a well-used upper-level circulation path. Make the stair a focal point, with an open baluster and a landing with a seat or a window. Maximize its daylighting potential.

Consolidate mechanical equipment into one dedicated space. If the budget doesn't allow that, make closets for individual pieces of equipment. Vent as necessary.

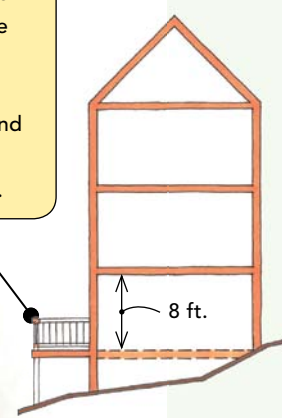
Basement above grade, on a hill? A small deck is an inexpensive addition that provides outdoor access and expands the interior space.

If you want a basement bathroom and the sewer line is above the basement, a not-too-expensive solution is a sewer pump. It requires regular maintenance but can be a real problem solver. Placing the bath below an existing bath will keep down plumbing costs.

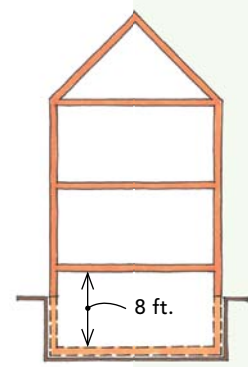
Electric radiant floors are another way to keep the chill out of a basement. They are inexpensive to install and operate, and they can be zoned to specific spaces, such as a bathroom.



No brainer The easiest space to convert is a dry basement with an existing floor and walls. As long as it has the minimum ceiling height, the only thing you need to do is evaluate the structural condition of the floors and walls and satisfy code requirements for habitable space.



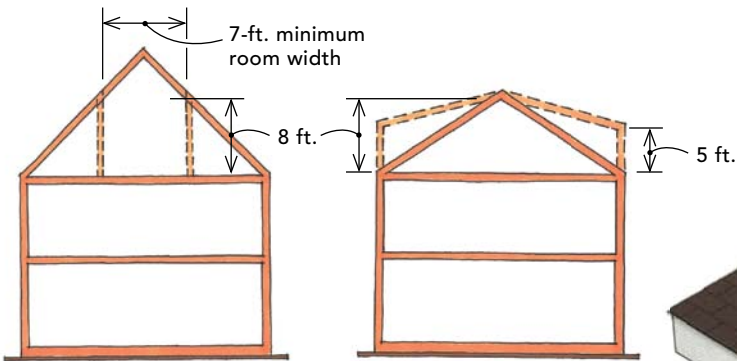
More complicated A bit more difficult conversion is creating a basement level from an existing large crawlspace by adding floor framing. This is a popular technique in hilly landscapes. Depending on the steepness of the grade, the new basement floor also might change levels as the grade descends.



Still might be worth it Raising a house to create a basement level is more expensive, but may be part of a foundation upgrade and drainage improvements. A slab floor adds the least height. A wood floor is easy to insulate, and the crawlspace below is a convenient area to run pipes, ducts, and electrical conduit.

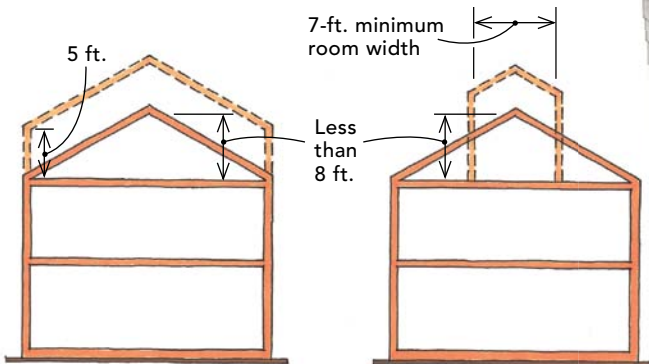
BASEMENT AND ATTIC REMODEL CHECKLIST

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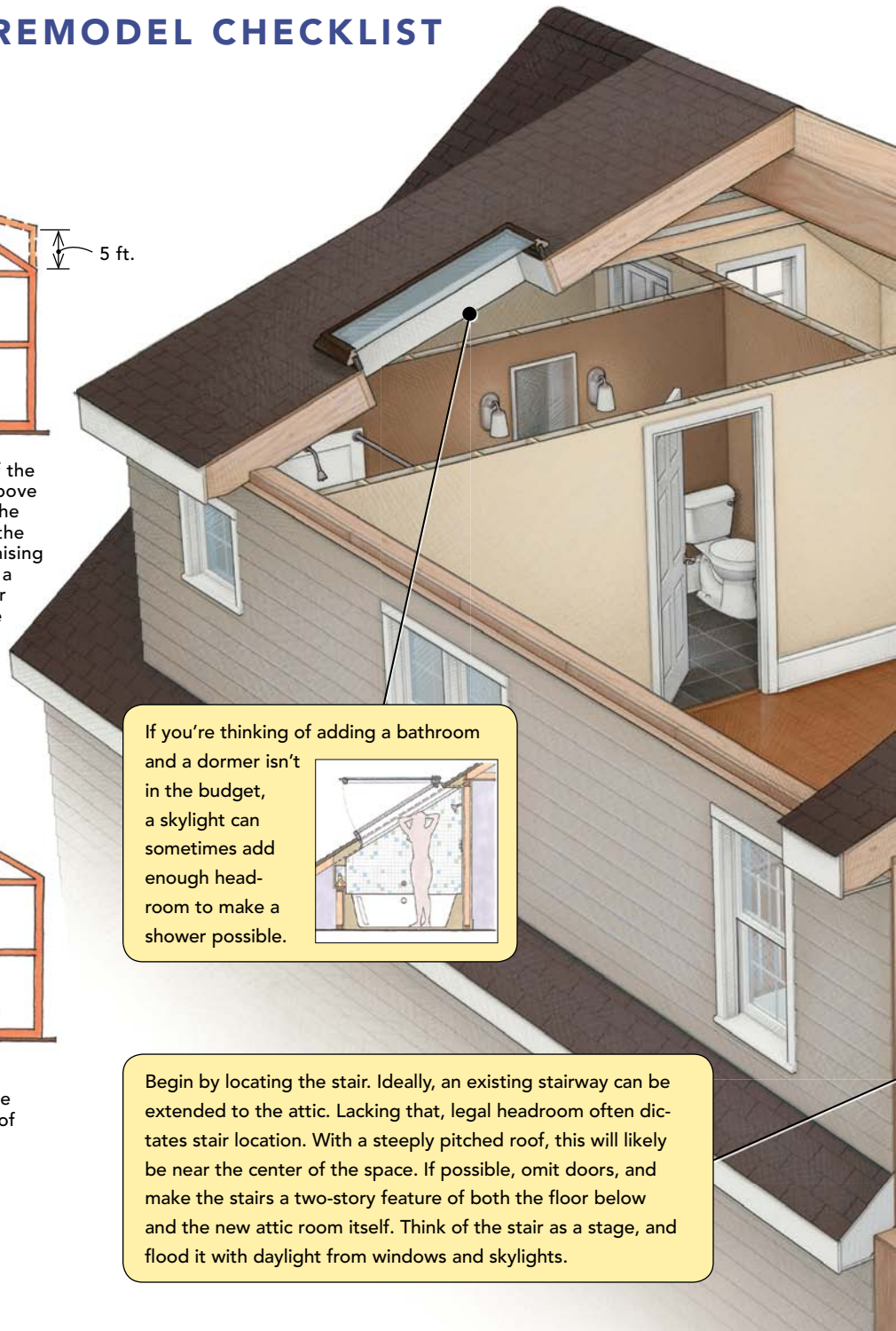


No brainer The easiest attic to convert is one that has a high ridge over a large area. The minimum ceiling height of 7 ft. 6 in. must extend over a floor area that meets minimum room size. For example, if you're adding a bedroom, you need at least a 70-sq.-ft. floor area with a ceiling height greater than 7 ft. 6 in.

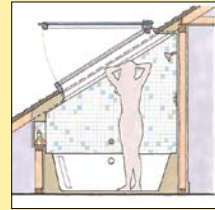
More complicated If the ridge is at least 8 ft. above the floor but most of the attic framing is lower, the simplest solution for raising the ceiling is to create a large dormer on one or both sides of the ridge to capture floor area.



Still might be worth it If an attic's ceiling height is too low for easy occupancy, a couple of remodeling options are available. You can either raise the entire roof or a portion of it large enough to accommodate the rooms you need.



If you're thinking of adding a bathroom and a dormer isn't in the budget, a skylight can sometimes add enough headroom to make a shower possible.

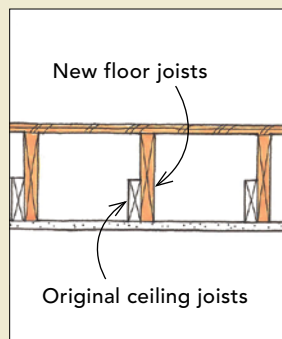


Begin by locating the stair. Ideally, an existing stairway can be extended to the attic. Lacking that, legal headroom often dictates stair location. With a steeply pitched roof, this will likely be near the center of the space. If possible, omit doors, and make the stairs a two-story feature of both the floor below and the new attic room itself. Think of the stair as a stage, and flood it with daylight from windows and skylights.

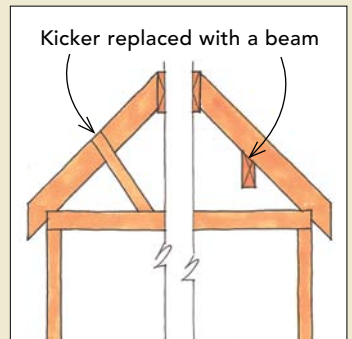
STRUCTURAL EVALUATION

Attic

In most cases, **floor framing** will be undersize because it's meant to support the weight of only the ceiling below. If headroom allows, the simplest way to strengthen the floor is to add larger floor joists between the ceiling joists and to cover them with a plywood subfloor. Lacking headroom, consider adding beams below ceiling joists to lessen their span. Sistering steel joists to existing joists is another space saver. Attic wall framing is typically sufficient. Add plywood sheathing for lateral stability.



Reinforce **sagging rafters**. If head clearance is sufficient, simply add properly sized rafters between the existing ones. If clearance is tight, consider grafting steel C-channels to the sides of the existing rafters. Rafters are sometimes braced at midspan by kickers, 2xs that bear on the ceiling joists. They can usually be replaced with beams.



CODE CONSIDERATIONS

Basement / Attic

Stairs They can be as long as 15 ft. for a straight run that rises 9 ft. (an 8-ft. ceiling height with 1-ft. structural framing). That doesn't include the 3-ft. landing required at the top and bottom. A U-shaped stair might need a more rectangular space, say about 6 ft. to 7 ft. wide by about 10 ft. long. Minimum stair width is 3 ft. Stair risers can be no more than 7¾ in. high (4 in. minimum), while treads can be no shorter than 10 in. Winding stairs and circular stairs are options with their own requirements.

Windows Bedrooms must have at least one legal egress window with a minimum clear opening of 24 in. high by 20 in. wide, and its sill no more than 44 in. from the floor. This requirement can often be solved with a window well. Code requires a habitable basement space to be heated. Cooling is not required, but ventilation is—typically operable windows. If they're not feasible, you'll need a mechanical system.

Attic ceiling heights In rooms with sloped ceilings, the prescribed ceiling height (7 ft. 6 in.) is required for one-half the area being converted. Any portion of the room measuring less than 5 ft. from the floor cannot be included in the square-footage total of the room, but you can still use that space. It's perfect for desks, sitting and bed alcoves, built-ins, closets, and storage.

Reverse-cycle ceiling fans can draw cool air into the attic in the summer and push warm air to the lower level in the winter. Add dimmable lights to the fans, and you've solved a lot of your venting and lighting needs.

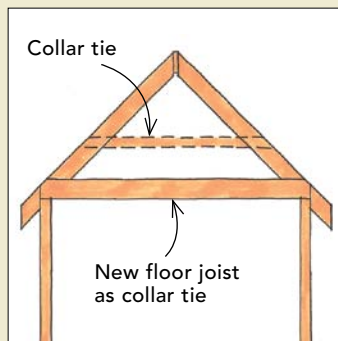
Look for special views, and design the new space around them. If there isn't a view, think about adding one unique, special window somewhere in the attic.

If your budget allows it, add a balcony.

A centrally located stair landing minimizes hallways, allowing room placement to pinwheel around the landing.

If you're adding short walls, build them as bookshelves or built-in seating. Built-ins make great use of the space under the roof at the eaves.

Collar ties are typically 2x members nailed to the sides of opposing rafters, spanning from one side of the roof to the other. They prevent the walls from spreading outward. Unfortunately, they also prevent the space from being usable. You can relocate collar ties to floor level, or beef up the size of the rafters and support them with a ridge beam. In either case, consult a structural engineer for specific details. (That goes for any structural modifications—basement or attic.)



MINIMUM DIMENSIONS

Habitable rooms: 70 sq. ft., with a 7-ft. minimum width and a closet of no minimum size.

Kitchens: Code minimum is 50 sq. ft., but try for at least 10 ft. sq. for a full kitchen, and 8 ft. sq. for a kitchenette (less than full-size appliances).

Half-bath: 3 ft. by 6 ft.

Full bath: 5 ft. by 8 ft.

Wet bar: 4-ft.-long counter

Living rooms and family rooms function well with about 15 ft. by 15 ft. and could use more if space is available.

Peaceful Coexistence

A sweet upstairs suite means rental income you can count on

According to neighborhood lore, the attic of this 1908 single-story house was partly converted to living space sometime in the 1930s when, instead of divorcing, the couple that owned it separated and the husband moved upstairs. It must have been like moving from the frying pan into the broiler, given the absence of any insulation in the attic. And so the attic remained—freezing cold in winter, roasting hot in summer—until the mid-1990s, when its present owner transformed it into the comfortable rental it is today.

Master carpenter Alan Jencks had three objectives for the attic: Maximize the size of the living space, minimize changes to the roof profile so that neighbors wouldn't get rattled, and make it nice. An apartment with thoughtful finish details would attract better tenants, command a higher rent, and accommodate the owners' dreams of renting out the downstairs and moving into the attic themselves.

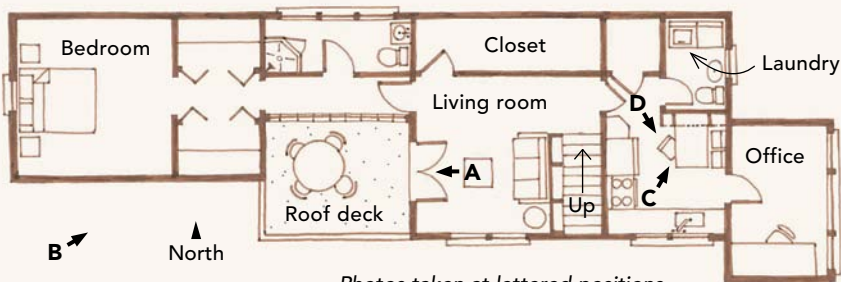
Because the banished husband had been living only in the back half of the attic, there was a lot of room for expansion, along with a few revisions (floor plan). The tricky part of the remodel was strengthening the framing. The sagging 2x4 roof rafters and 2x6 floor joists spanning 14 ft. were seriously undersize. Steel fitch plates reinforce the floor joists, and 2x4s bolted to the tops of the old rafters strengthen the roof (drawings facing page).



An attic apartment with a sheltered deck

By barely changing the street-side elevation, the owners of this attic in-law suite kept their neighbors' goodwill. The gable-end window is in the master bedroom and works with a skylight to vent the room. Set well back from the street, the roof deck is hardly noticeable. Photos taken at A and B on floor plan.

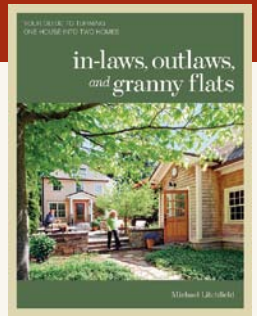
The living room and kitchen stayed put to minimize plumbing revisions, and the old bathroom became a laundry/powder room. On the street side, the storage space became a master bedroom. A shed dormer made room for a new bath and closet.



Photos taken at lettered positions.

Drawings: Martha Garstang Hill





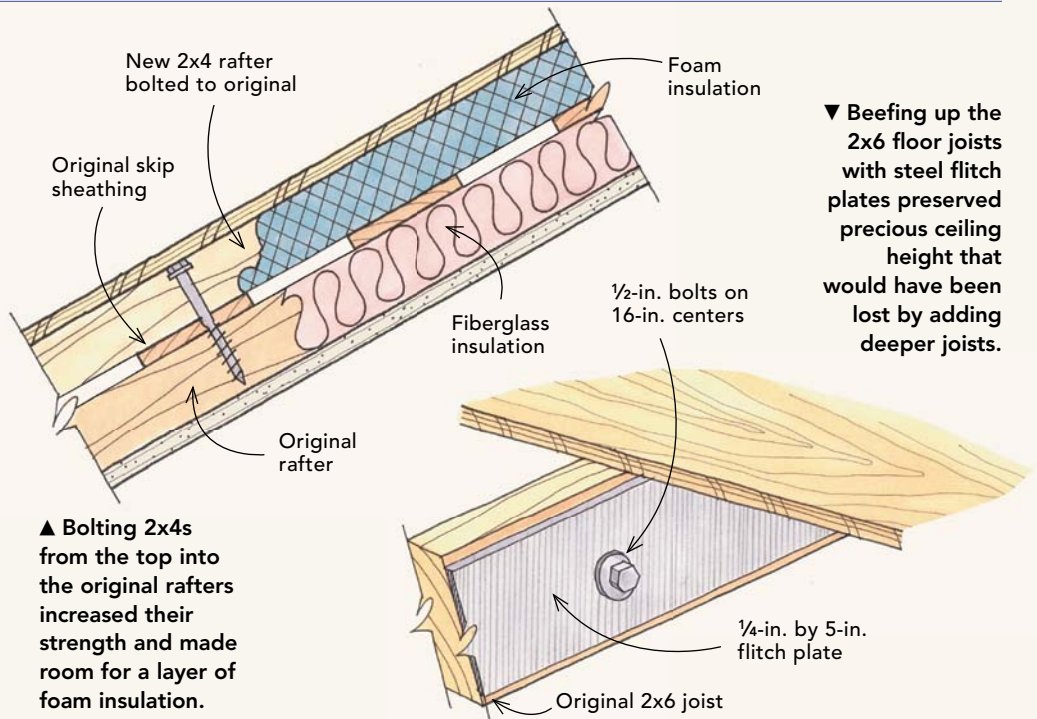
The wake-up side of the apartment. At the southeast corner, the kitchen and home office enjoy the day's first light. Beadboard paneling and creamy vanilla tile are in keeping with the home's cottage feel. Fold-up seats and a kitchen table add flexibility to the little kitchen. Photos taken at C and D on floor plan.



Soundproofing advice

Minimizing noise—things that go bump in the night, growling appliances, flushing toilets—makes for good upstairs/downstairs neighbors. To that end:

- Cast-iron pipe is far better than plastic pipe for suppressing the sound of rushing water.
- To limit noise from the refrigerator, Jencks placed it on resilient flooring mounted on 1/4-in. plywood underlayment atop a thin foam pad typically used under floating floors.
- The washer and dryer are mounted on a platform fastened to the steel-spring-and-neoprene vibration isolators often used to mount commercial cooling units to roofs.
- Sound transmission through the floor can be cut by packing the joist bays with cellulose insulation.



From Gloom to Glory

A sunny apartment emerges from the shadows

Whenever Larry and Ann Tramutola peered into their basement, they saw a cavernous black hole of dank, wasted space. The front of the house was at grade level, but in the back, the floor was roughly 10 ft. above grade. Most of the buildings on adjacent lots were taller, and a carport next to the back stairs blocked even more light. To make the basement even darker and more constricted, the stairs cut across the back of the house. Amid the gloom, however, architect Jon Larson saw dazzling possibilities.

If, for starters, you demolished the parking structure and moved the stairs all the way to the setback line, you'd have room for an outdoor patio. And with the east wall of the basement now open to the morning sun, you could install double sets of 8-ft.-high French doors, bringing sunlight deep into the space.

Rebuilding the basement and upgrading the drainage wouldn't be cheap, but the property had appreciated nicely since Ann and Larry bought it 30 years earlier. Plus, they were committed to staying in the community. They decided to create an in-law apartment they'd want to live in. They could rent it, use it as an office, put up relatives, or house one of their kids.

Developing the basement also improved the upstairs. Moving the exterior stairs to one side gave the upper deck greater privacy. Reframing the basement ceiling proved a good time to replace the bungalow's 80-year-old plumbing. Once the basement ceiling was soundproofed, the upstairs floors were warmer and more comfortable than they had ever been.

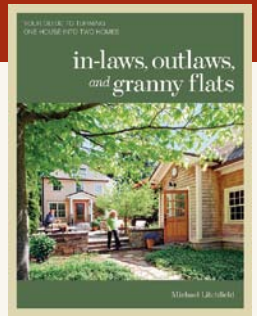


Trading a carport for a garden

Getting rid of the carport and moving the stair to the east side of the lot made room for a sunny patio sheltered in part by the upstairs rooms and deck. By repositioning the stairs, removing the carport, resurfacing the parking area, and erecting a screen that will eventually be covered with vegetation, the architect created a sunny patio without sacrificing any parking spaces. The stove is just in front of the base of the now-removed brick chimney. Photos taken at A on floor plan.

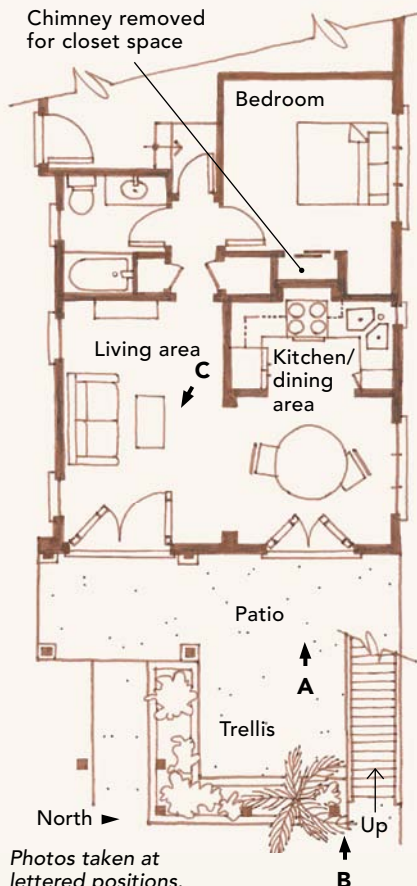
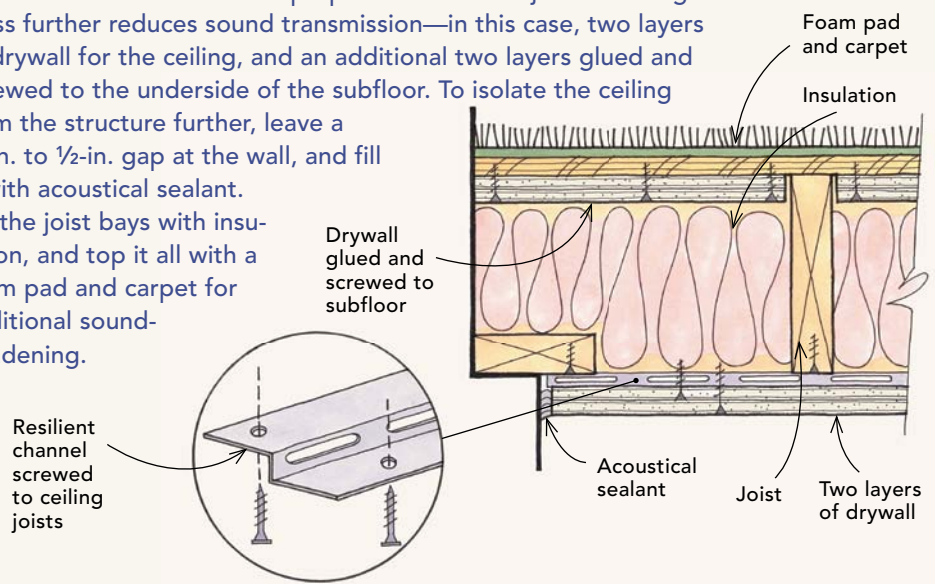
Before. It's just a crawlspace on the street side, but as the hill falls away to the south, the basement ceiling rises to 10 ft.

After. Tall French doors create an indoor-outdoor patio. With its generous overhang, the patio is a great place to entertain, whatever the weather. Photo left taken at B on floor plan.



Soundproofing a ceiling

Reduce sound transmission through a drywall ceiling by limiting the drywall's contact with the ceiling joists. This ceiling is affixed to resilient channels that run perpendicular to the joists. Adding mass further reduces sound transmission—in this case, two layers of drywall for the ceiling, and an additional two layers glued and screwed to the underside of the subfloor. To isolate the ceiling from the structure further, leave a ¼-in. to ½-in. gap at the wall, and fill it with acoustical sealant. Fill the joist bays with insulation, and top it all with a foam pad and carpet for additional sound-deadening.



Photos taken at lettered positions.



Garden in progress. The patio gets a lot of use in warm weather. Once the screen of flowering vines has grown in, you'll hardly know the cars are there. It will feel more park than parking. Photo taken at C on floor plan.