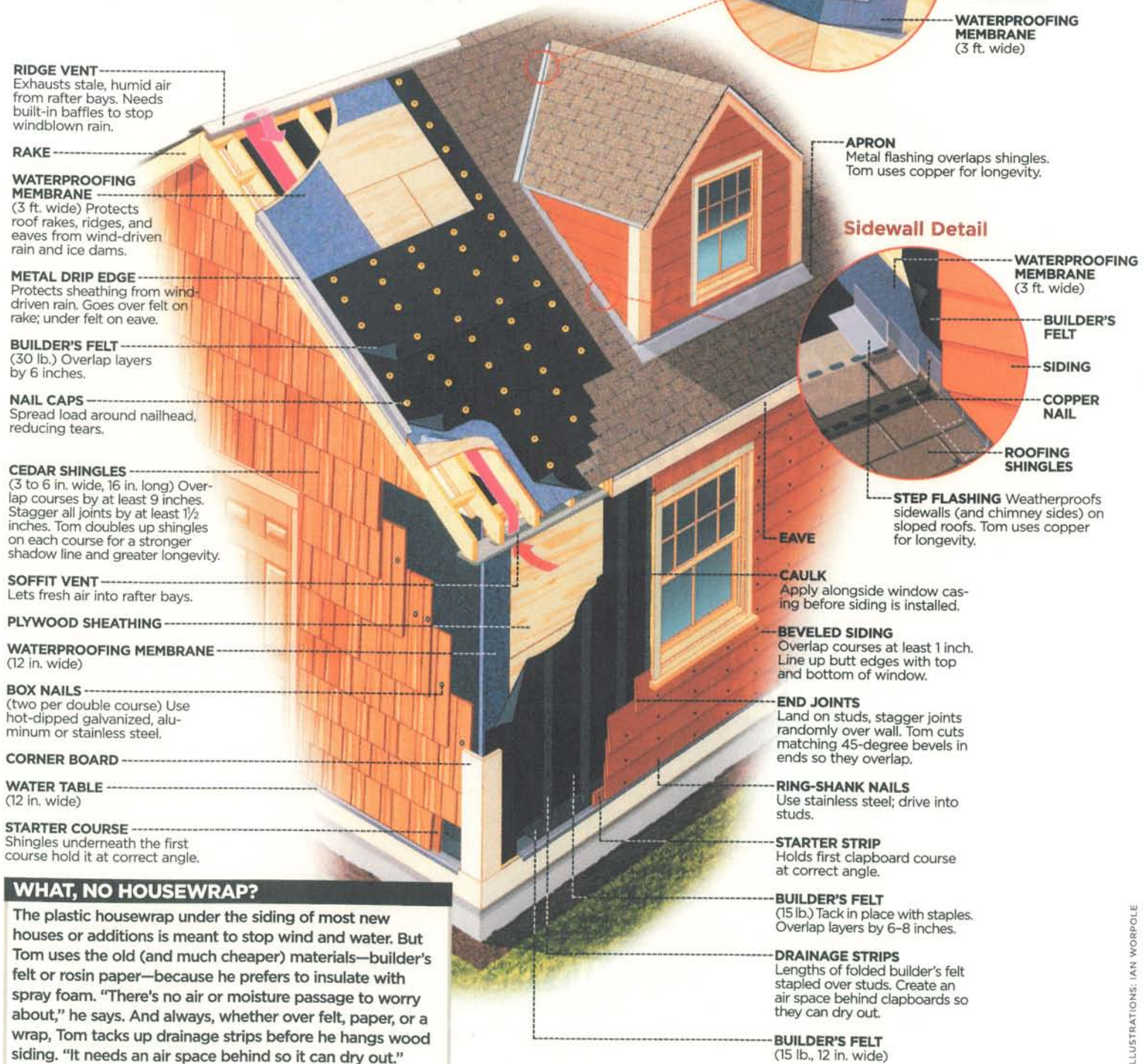


A Many-Layered Thing

No roofing or siding material by itself is a perfect barrier against the elements. So before the outer skin goes on, Tom Silva protects all the vulnerable areas—the corners and edges—with sticky strips of waterproofing membrane. Then he tops everything with layers of builder's felt, a thick, asphalt-impregnated paper.



RIDGE VENT
Exhausts stale, humid air from rafter bays. Needs built-in baffles to stop windblown rain.

RAKE

WATERPROOFING MEMBRANE
(3 ft. wide) Protects roof rakes, ridges, and eaves from wind-driven rain and ice dams.

METAL DRIP EDGE
Protects sheathing from wind-driven rain. Goes over felt on rake; under felt on eave.

BUILDER'S FELT
(30 lb.) Overlap layers by 6 inches.

NAIL CAPS
Spread load around nailhead, reducing tears.

CEDAR SHINGLES
(3 to 6 in. wide, 16 in. long) Overlap courses by at least 9 inches. Stagger all joints by at least 1½ inches. Tom doubles up shingles on each course for a stronger shadow line and greater longevity.

SOFFIT VENT
Lets fresh air into rafter bays.

PLYWOOD SHEATHING

WATERPROOFING MEMBRANE
(12 in. wide)

BOX NAILS
(two per double course) Use hot-dipped galvanized, aluminum or stainless steel.

CORNER BOARD

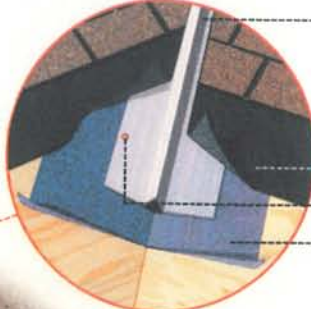
WATER TABLE
(12 in. wide)

STARTER COURSE
Shingles underneath the first course hold it at correct angle.

WHAT, NO HOUSEWRAP?

The plastic housewrap under the siding of most new houses or additions is meant to stop wind and water. But Tom uses the old (and much cheaper) materials—builder's felt or rosin paper—because he prefers to insulate with spray foam. "There's no air or moisture passage to worry about," he says. And always, whether over felt, paper, or a wrap, Tom tacks up drainage strips before he hangs wood siding. "It needs an air space behind so it can dry out."

Valley Detail



VALLEY FLASHING
Weatherproofs roof valleys. W-style flashing has a ridge along its length that reduces splashing. Tom uses copper for longevity.

BUILDER'S FELT

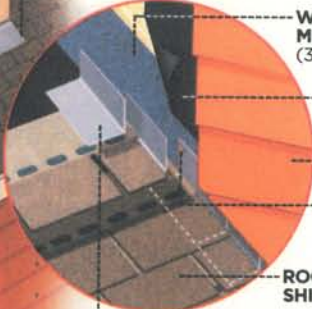
COPPER NAIL

WATERPROOFING MEMBRANE
(3 ft. wide)

APRON

Metal flashing overlaps shingles. Tom uses copper for longevity.

Sidewall Detail



WATERPROOFING MEMBRANE
(3 ft. wide)

BUILDER'S FELT

SIDING

COPPER NAIL

ROOFING SHINGLES

STEP FLASHING Weatherproofs sidewalls (and chimney sides) on sloped roofs. Tom uses copper for longevity.

EAVE

CAULK
Apply alongside window casing before siding is installed.

BEVELED SIDING
Overlap courses at least 1 inch. Line up butt edges with top and bottom of window.

END JOINTS
Land on studs, stagger joints randomly over wall. Tom cuts matching 45-degree bevels in ends so they overlap.

RING-SHANK NAILS
Use stainless steel; drive into studs.

STARTER STRIP
Holds first clapboard course at correct angle.

BUILDER'S FELT
(15 lb.) Tack in place with staples. Overlap layers by 6-8 inches.

DRAINAGE STRIPS
Lengths of folded builder's felt stapled over studs. Create an air space behind clapboards so they can dry out.

BUILDER'S FELT
(15 lb., 12 in. wide)

Silva Solutions

LET IT BREATHE

A ventilated house is a healthy house

No matter where you live, whether it's the Sun Belt or snowy New England, insulation traps the heat (and the cold) that makes a house more comfortable. But insulation also traps the moisture emanating from basements, boiling pots, steamy showers, clothes dryers, plants, even the simple act of breathing.

Before the current era of insulation, houses could easily rid themselves of this moisture—typically one to two gallons a day. Warm air, with its load of water vapor, escaped through gaps in the top and sides of a house and was replaced by an equal amount of fresh air infiltrating through cracks and openings near the bottom. Life inside could be drafty, yet everything stayed dry. Ever since the Arab oil embargo of 1973, however, Americans have obsessively insulated their houses and weather-stripped or caulked every opening to keep fuel bills to a minimum, effectively locking all that water vapor inside. With no means of escape, wet, saturated air readily condenses wherever it contacts a cold surface, and fosters the growth of rot and such serious allergens as molds and mildew. "The tighter the house is, the more humidity is trapped inside," says *This Old House* contractor Tom Silva. "As a rule, the more you insulate, the more you have to ventilate."

BY CURTIS RIST

To prevent moisture buildup, Tom doesn't suggest that we go back to building drafty houses or leaving windows open in the winter. Instead, he makes sure that specific areas inside the house are actively ventilated. In bathrooms, the kitchen, and the laundry room, for instance, he installs exhaust fans to whisk away moisture at the source and propel it outside. And if a house is very tight, he'll balance the outgoing air with a supply of warmed "makeup" air provided by a heat exchanger. Roofs need their own ventilation, either via gable vents or fans where an attic has no insulation, or air channels between the cold roof deck and the warm insulation where it does exist. "Ventilation makes the difference between a house that will last and one that doesn't," says Tom.

ATTIC

When there's no insulation beneath the roof sheathing in an attic, Tom keeps the air fresh with louvered vents and fans at the gable ends. Well-ventilated attics prevent ice dams in winter, and lower cooling bills in summer.

KITCHEN AND BATHROOMS

Tom always installs exhaust fans above showers or stovetops to draw the moisture produced by cooking and bathing. "But the fans have to be vented outside the house, not into the attic," he says. "Otherwise you're dumping moisture on the underside of the roof." In his own house, he installed timer switches to allow bathroom fans to run for a full hour.

DRYER

A clothes dryer should be vented directly outside, but not less than two feet beneath a soffit vent. "That warm, wet air can rise and accumulate underneath the roof sheathing," he says. For houses with hip roofs, Tom installs dryer vents straight through the roof.

ROOF

Humid air trapped in a roof means one thing to Tom: "Goodbye roof. It'll rot out in just a few years." So he creates a path for air to move underneath the roof sheathing from the soffits to the ridge. He installs continuous vents at the soffits, makes sure there is an uninterrupted air channel at least an inch or two deep underneath the roof, and lays a continuous vent along the ridge. If a ridge vent isn't possible, he'll put mushroom vents on the back side of the roof.

AIR EXCHANGERS

In a tight house, exhaust fans can pull outside air down chimneys and furnace flues to make up for the moist air they expel, causing fires or a buildup of dangerous gases. To prevent such backdrafts, Tom installs heat exchangers to balance the flow of exiting air with an equal supply of incoming fresh air. The exchanger captures some of the heat from the expelled flow and warms the entering air.

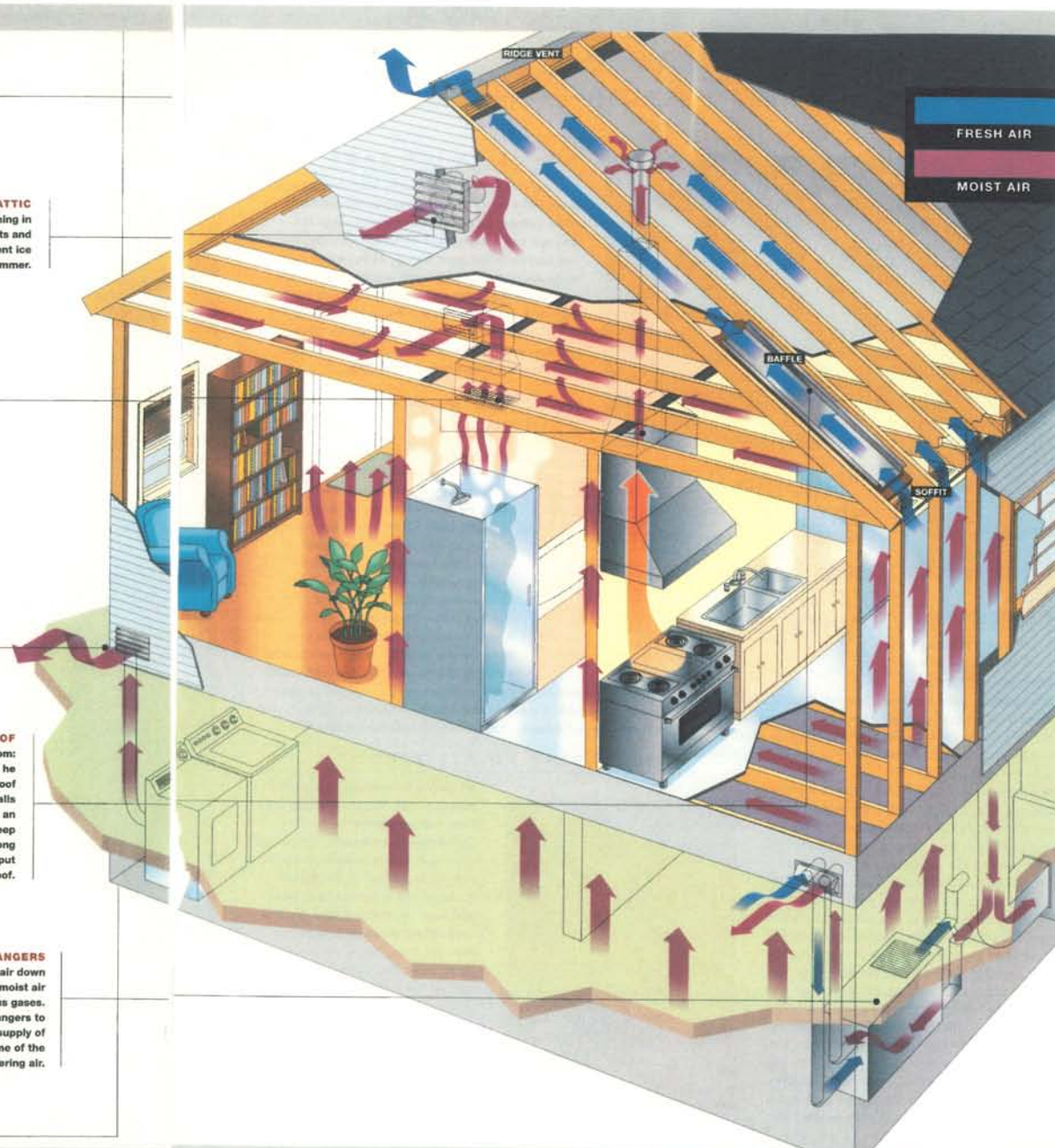


ILLUSTRATION BY STEVEN STANKIEWICZ