Built for Foul Weather

A new home on the Oregon coast blends reclaimed materials with durable details





Drawings: Bob La Pointe

Built with the best, for the worst. *This home is punctuated with attractive materials and details that also withstand extreme weather, like the cedar cladding in shingle and board-and-batten form. Photo above taken at A on floor plan.*

BY NATHAN GOOD

The Pacific Coast is a beautiful, brutal place to build. The weather along the Oregon coast is particularly tough on dwellings. It is not uncommon for there to be 70 in. to 90 in. of rain per year. High winds pound rain at windows and cladding. Salt-laden air silently chews away at exposed metal surfaces. Water and vapor seek to infiltrate houses, launching colonies of mold and reducing the effectiveness of insulation. Earthquakes, tsunamis, and fires all patiently await their turn to deliver unexpected damage.

On a 50-ft. by 100-ft. lot a block from the ocean in the quaint village of Neskowin, my clients wanted a home that would be comfortable when they were alone or with family and friends, and that would highlight large amounts of reclaimed Douglas-fir lumber. Above all, they wanted a place to withstand the punishment that such a harsh environment can deliver.

Hybrid construction: A mix of old and new

The choice of materials used to build this house is a reflection of my clients' love of old wood buildings, barns, mining structures, and historic lodges, and of their passion for their family heritage. Terry was raised in the lumber industry, eventually managing his family's lumber business. He and his wife, Teresa, obtained a substantial portion of the wood for their house from the deconstruction of a 1938 warehouse on the family's property. The salvaged Douglas fir was used for columns and beams, roof framing, flooring, cabinetry, wall paneling,

SPECS

Bedrooms: 3

Bathrooms: 2

Size: 2185 sq. ft.

Completed: 2010

LEED rating: Gold

Location: Neskowin, Ore.

Architects: Nathan Good, David Gellos, and Studio 3 Architecture

Builders: Tom Springer, Paul Jordan

Energy consultant: Charlie Stephens

doors, interior trim, and some of the home's furniture (sidebar, facing page). Even the hardware and fasteners from the old structure were reused as cabinet handles, towel bars, and drawer pulls, and for a beautifully crafted balcony railing that was designed by the family.

An early challenge for the design-build team was figuring out how to leave the underside of the roof structure exposed. To highlight the salvaged Douglas-fir roof, ceiling joists, and massive beams, we set 7 in. of polyiso rigid-foam insulation above the structural sheathing, resulting in an R-value of roughly 46. All the seams in the insulation were staggered and sealed with flashing tape to prevent air and vapor movement through the roof. To accentuate the salvaged wood further, we placed ¾-in.-thick reclaimed boards under the ½-in. plywood roof sheathing. This type of assembly enables the sought-after look of an exposed roof structure while maintaining the high-performance demands of a modern home.

The exterior walls, which are composed of 2x6 studs and filled with a 2-in. flash coat of closed-cell spray foam and 3½ in. of Johns Manville blown-in Spider formaldehyde-free fiberglass, are a bit more conventional and mostly finished with drywall. A ½-in.-thick layer of XPS rigid foam was applied to the exterior under a rain screen to break the thermal bridging of the wood framing; this brought the wall assembly up to R-30. Many of the interior walls, however, are finished with rough-sawn Douglas-fir boards. The house's enhanced insulation package cost approximately $8000 more than a house that is built to current Oregon Energy Code standards.

The windows in the house are all double-pane, low-e, argon-filled units from Mar-

A sweeping balcony connects interior spaces. *The cantilevered second-floor balcony of reclaimed Douglas fir overlooks the kitchen and provides access to bedrooms and an upstairs living area with a custom railing (photo left). Clerestory windows illuminate spaces above and below. Photo taken at B on floor plan.*

Materials with history add instant charm

Our family business, Hancock Lumber of Oregon (not to be confused with Hancock Lumber of Casco, Maine) served clients from 1963 to 1993. We specialized in supplying door, window, architectural-millwork, and water-flume/wood-tank

manufacturers with clear Douglas fir, hemlock, and redwood. In our better years, we were shipping more than 35 million bd. ft. annually. My father and I decided to shut our doors in the mid-1990s. We leased our property to another business for a few years before it, too, shut down with the curtailing of the harvesting of timber in the Northwest.

The warehouse we used, built in 1938, stood on a lumber-remanufacturing site until our family finally deconstructed the building for components to be used in this house.

The building was brought down, and materials were inventoried and spread on lumber bunks across a 9½-acre site. For three weeks, we teamed up with a local church group, which performed the work as a fund-raiser, to remove nails, bolts, washers, screws, and split-ring washers. The result was neatly stacked lumber that ranged from 12x12 beams to 1x6 boards.

After deconstruction, we kept the materials in a heated warehouse with good airflow and delivered the lumber with a moisture content of 10% to 12%. Joe Vondrak of Pacific Crest Construction in Portland, Ore., recommended using a Makita power-wheel brush sander (model 9741) with an SC-80 nylon wheel brush to clean up all the lumber. The bristle brush beautifully highlights the texture and grain in the wood, which makes it ideal for cleaning up reclaimed and rough-sawn material.

The only resawing and milling we did was for the material used as flooring, doors, and cabinets. The only staining we did was on the edges of the boards that were ripped to fit on site.

All the salvaged wood was finished with Aqua Zar Antique Flat water-based polyurethane. It is nonyellowing, self-leveling, and crystal clear when dry.

—Terry Hancock, homeowner

A great room with fine details. *Flooded with daylight, the living room is anchored by a chimney made of locally quarried stone. Reclaimed Douglas fir was used as framing, flooring, trim, and shelving, and as material for the built-in cabinets. Old bolts were powder-coated and used as cabinet hardware. Photo taken at C on floor plan.*

vin that have aluminum-clad exteriors and Douglas-fir interiors. These energy-efficient windows, which have a U-factor of 0.29, were $2000 beyond the cost of Marvin units that meet the Oregon Energy Code's U-factor minimum of 0.35. The wood interiors were finished to match the tone of the reclaimed wood used elsewhere in the house.

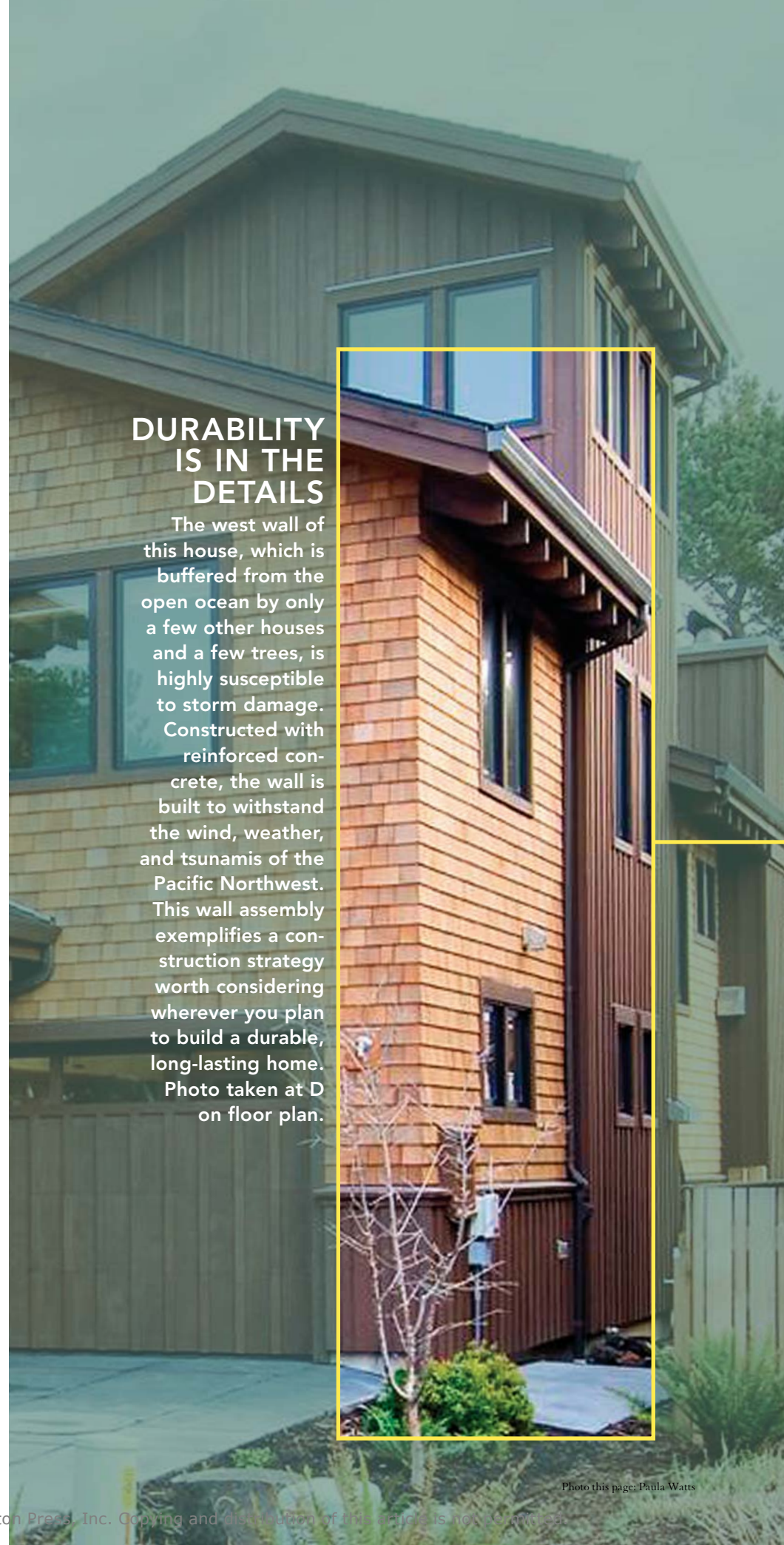
Mechanicals save energy and create a healthful home

My clients had a strong interest in using radiant-heat flooring. To facilitate a more rapid response between the demand and the supply, we floated the reclaimed-wood floorboards on sleepers over the concrete slab, which was insulated from below with two layers of 2-in. XPS rigid foam. We wove the radiant-heating tubes in the chases that were created by the sleepers. This radiant-floor system cost $7500 more than a conventional air-supply furnace, but it offered the comfort and thermal stability that my clients were looking for.

The hot water for the radiant-heated floors and for domestic use is produced by an ultra-efficient Daikin Altherma air-to-water heat pump. With a coefficient of performance greater than 3.4, its efficiency exceeds that of conventional heat-pump systems, which have a COP of 2.7. It is also a good alternative to a solar-thermal system, especially in climates dominated by overcast skies during the cooler months of the year. The Daikin Altherma heater was approximately $3500 more than less efficient units and qualified for an Oregon tax credit of $560.

We included a High Country series NZ6000 wood-burning fireplace from Napoleon as a backup heat source, important for a region where conventional energy sources are vulnerable during severe storms. To help maintain quality indoor air and to preserve the energy efficiency of a house, we specify closed-air systems that rely completely on outside air for combustion. Indoor-air quality is a major concern for coastal homes. Building an airtight house increased the need for appropriate ventilation. Most rooms have operable windows on opposite walls to facilitate cross ventilation. Windows in the surf tower, the small third-floor room that offers 360° views of the coastline and mountains, are designed to serve as a thermal chimney (see "How It Works" in *FHB* #213).

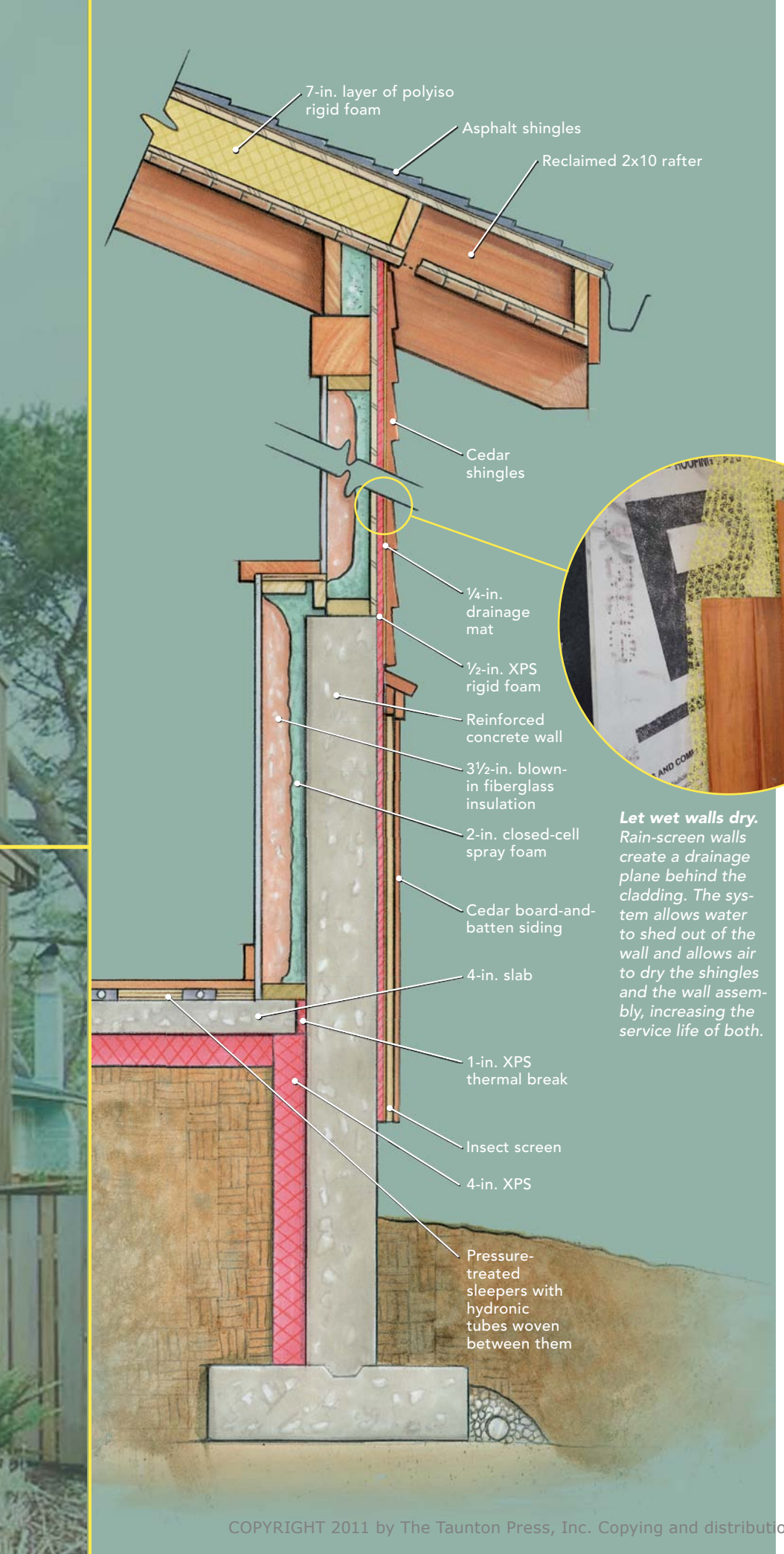
A key element in the construction of this home is the integration of the Zehnder heat-



DURABILITY IS IN THE DETAILS

The west wall of this house, which is buffered from the open ocean by only a few other houses and a few trees, is highly susceptible to storm damage. Constructed with reinforced concrete, the wall is built to withstand the wind, weather, and tsunamis of the Pacific Northwest. This wall assembly exemplifies a construction strategy worth considering wherever you plan to build a durable, long-lasting home. Photo taken at D on floor plan.

Photo this page: Paula Watts



Let wet walls dry. *Rain-screen walls create a drainage plane behind the cladding. The system allows water to shed out of the wall and allows air to dry the shingles and the wall assembly, increasing the service life of both.*

recovery ventilator (HRV), one of the first installed in the United States. To reach the rooms on the ground level, 3-in.-dia. polyethylene ventilation tubes were placed under the first-floor slab. The tubes are simple to install, are free of elbows and sharp bends, and have less internal resistance to airflow than conventional sheet-metal ducts. The cost ended up being around $4750.

Built to withstand the weather

This house sits 27 ft. above sea level and rests atop a slab-on-grade foundation. Foremost in our minds was protecting the house from a rogue wave. In response to the threat of rising sea levels, the floor level of the home was raised 2 ft. above the natural grade of the site. To protect the home from the ocean, the side of the home facing the coast was constructed with a 4-ft.-high concrete wall to resist any potential surge and impact forces from debris. (Fortunately, when the tsunami from the Japan earthquake hit the Oregon coast last March, it was low tide, so the concrete wall went untested.) Raising the floor elevation and constructing the concrete wall on the seaward side of the house added approximately $9000 to the cost of construction on this project.

Building near an ocean requires careful consideration of design details and materials that help to reduce the threat of corrosion from the salty air. We used heavy-gauge stainless steel for all of the flashing above doors and windows and beneath roof overhangs, and for exterior ventilation caps. The structural connections placed between the heavy timber framing on the exterior are stainless steel as well. Corrosion-resistant construction added approximately $2500 to the house's cost.

We also were careful to design generous roof overhangs to protect the exterior walls from rain. The entire exterior is clad with either cedar shingles or cedar board-and-batten siding for a low-maintenance, long-lasting exterior that will weather naturally over the years, but not rot. □

Nathan Good, AIA (www.nathangoodarchitects.com), designed this home with Studio 3 Architecture (www.studio3architecture.com) and David Gellos (www.gellosarchitect.com). Photos by Rob Yagid, except where noted.