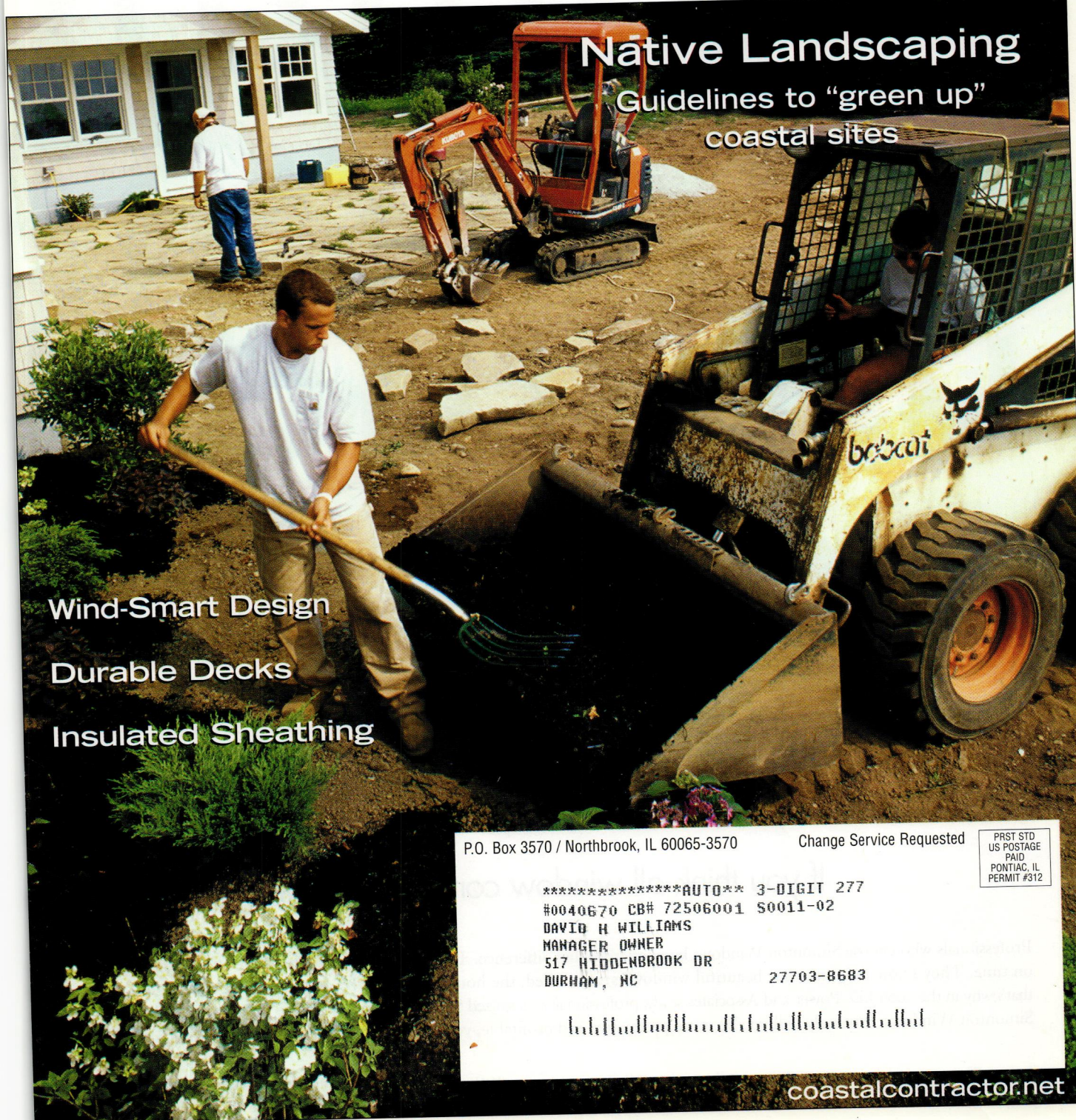


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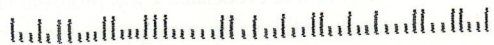
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November/December 2006

Features

Native Landscaping for Coastal Homes

Drawn to the coast for its natural beauty and wildlife, yet increasingly confronted by red tides, fish kills, and contaminated beaches, many coastal residents are deeply concerned about the environment. While they cannot single-handedly save the coast, a growing number are seeking out builders and landscapers who can help them make a difference in their own front yards, by landscaping with environmentally friendly native plants. — page 34

Robust Walls

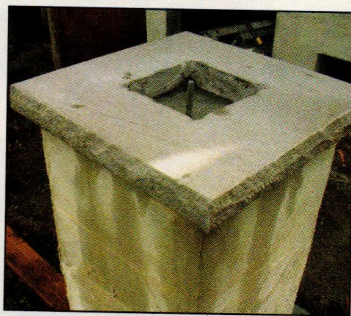
Contributing R-3 to R-7.5 per inch, sheet foam is a handy way to boost a wall's total R-value without adding too much thickness. Rigid foam sheathing can also function well as a drainage plane to help keep wind-blown water out of walls, and it can act as both an air barrier and as a vapor barrier too. These properties make it a good choice in most coastal climates — but only if you get the details right. Ted Cushman explains how to design and detail a foam-sheathed wall system with all functions in mind, taking into account the site's climate and weather exposure. — page 40

Durable Decks

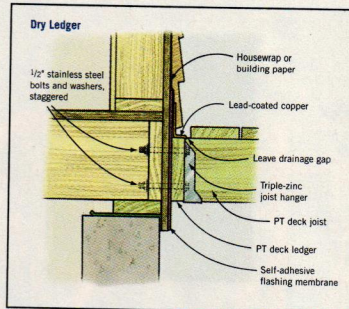
Decks and porches on beach homes take the brunt of any storm. Add to that the homeowners' desire for low-maintenance finishes that stand the test of time even in a salt environment, and it's clear that builders have to be especially fussy about their deck materials choices and installation methods. Charles Wardell asked three East Coast builders who work on waterfront homes what materials and techniques they recommend for exterior decks. All agreed durability is the goal, but they each take a slightly different path to get there. — page 50



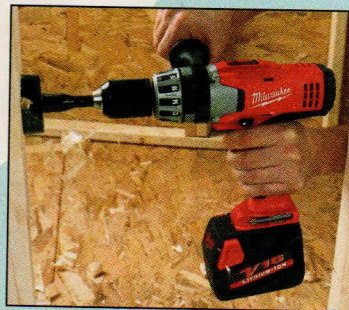
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May the Best Practices Succeed

Riding out a downturn is not a time for sitting still

It comes as no real surprise that real estate markets are cooling off. The country's been waking up to this idea since early in the year, and coastal communities are no exception. As Aaron Hoover reports in this month's *Breakline* (page 11), it's the hottest home markets that feel the most pain when the market cools down.

However, there is one bright note for coastal contractors in this gloomy housing market: There is a consensus that well-established builders will prosper, while speculators and fly-by-night contractors will be weeded out.

According to the National Association of Home Builders (NAHB), production and sales will slow down over the next few years in response to higher mortgage rates. But the number of homes constructed and renovated over the long term will depend less on interest rates than on demographic trends. And demographics favor the coastal contractor. People will always want to live at the shore, along the cliffs and tidal creeks, on the islands, and by the bays that define our country's coastlines. This trend is bolstered by expectations that vacation-home sales will remain strong, while sales of second homes for investment purposes are expected to decline. In addition, remodeling of owner-occupied homes will continue to grow, while remodeling of renter-occupied homes will slow down. These trends suggest that work is not going to go away entirely, and especially not in the high-end remodeling and vacation-home markets. But overall, there'll be less work available, and chances are good that the clients will be more demanding. This is a market that favors high-quality custom work.

The goal, I think, is not to hang in there *until* the market rebounds, riding out the downturn like some droll weather watcher. Rather, those who will succeed are the builders and remodelers with ironclad reputations who can capture the work available *now*. And yes, that will position them to continue to prosper in the future. — *Clayton DeKorne*

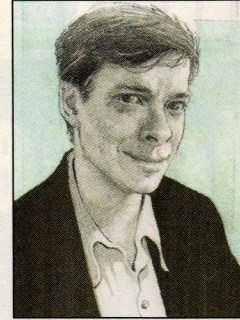


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What's Hot ... and What's Not

In the current economic climate, here's the latest:

What's out: Keeping prices low by working over subcontractors to gain the narrowest margins possible.

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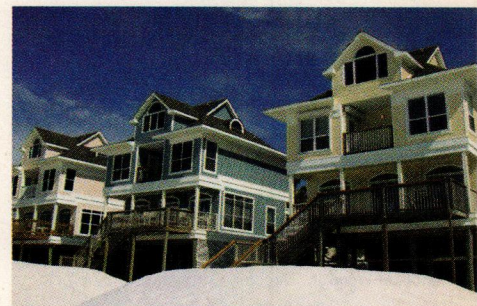


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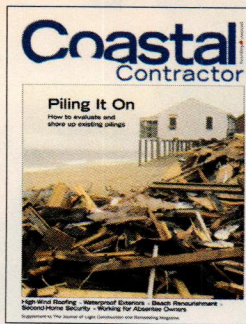
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~ Letters

Piling Costs

I am working with a potential client who asked, "What is the cost of installing pilings?" Do you have a feel for this? I know it is a function of the type of soil and the depth that the piles need to be driven to "set," but is there a rule of thumb?

Tom Bartus
Surf City, N.C.

Due to the variability in pile types and site conditions, the best we can do is to point you to the FEMA 550 documents, which were reviewed in the last issue ("Strong, Safe Foundations," September/October 2006). The completed documents are now available online at <http://www.fema.gov/library/viewRecord.do?id=1853>. Appendix E, "Cost Estimating," provides a breakdown of installed foundation costs for timber pile, timber pile with concrete column and grade beam, and steel pipe pile with concrete column and grade beam, among others. A range of costs is provided for different elevations above grade (the higher you go, of course, the more expensive it gets). Costs presented are based on a 1,200-square-foot footprint for a single-story home at an assumed 130-mph wind speed, and reportedly include applicable taxes, overhead, profit, and other sub-tier contract costs.

Coastal Plans Source

I love your magazine! The content is perfect for such a large segment of a growing area of the construction industry. I've been designing and building homes on Long Beach Island, N.J., for 20 years and I appreciate having a trade journal that represents what I do.

I have a question with respect to your magazine: Would your readers be interested in "stock plan" sales for waterfront/waterview/coastal conditions? As an architect specializing in pile construction, small lot designs, and coastal vernacular, I've built up a library of hundreds of successful home designs that are specific to the readers of your magazine. I am actively seeking a distributor/vendor/partner in the sales or promotion of my plans.

Michael Pagnotta, AIA
Ship Bottom, N.J.

Trade Knowledge

I wanted to express thanks for your Web site. I was pleased to find a resource that shares information so others can benefit from past experience and case studies that illustrate the thought process of other contractors.

I am a state licensed contractor on Cape Cod, and although there are plenty of people in the trades, they don't necessarily give much thought to what they do every day. Thank you for passing on your acquired knowledge and observations and enlightening those of us who can, and will, extend the courtesies to others.

Don Dvorovy
South Chatham, Mass.



We want to hear from you!

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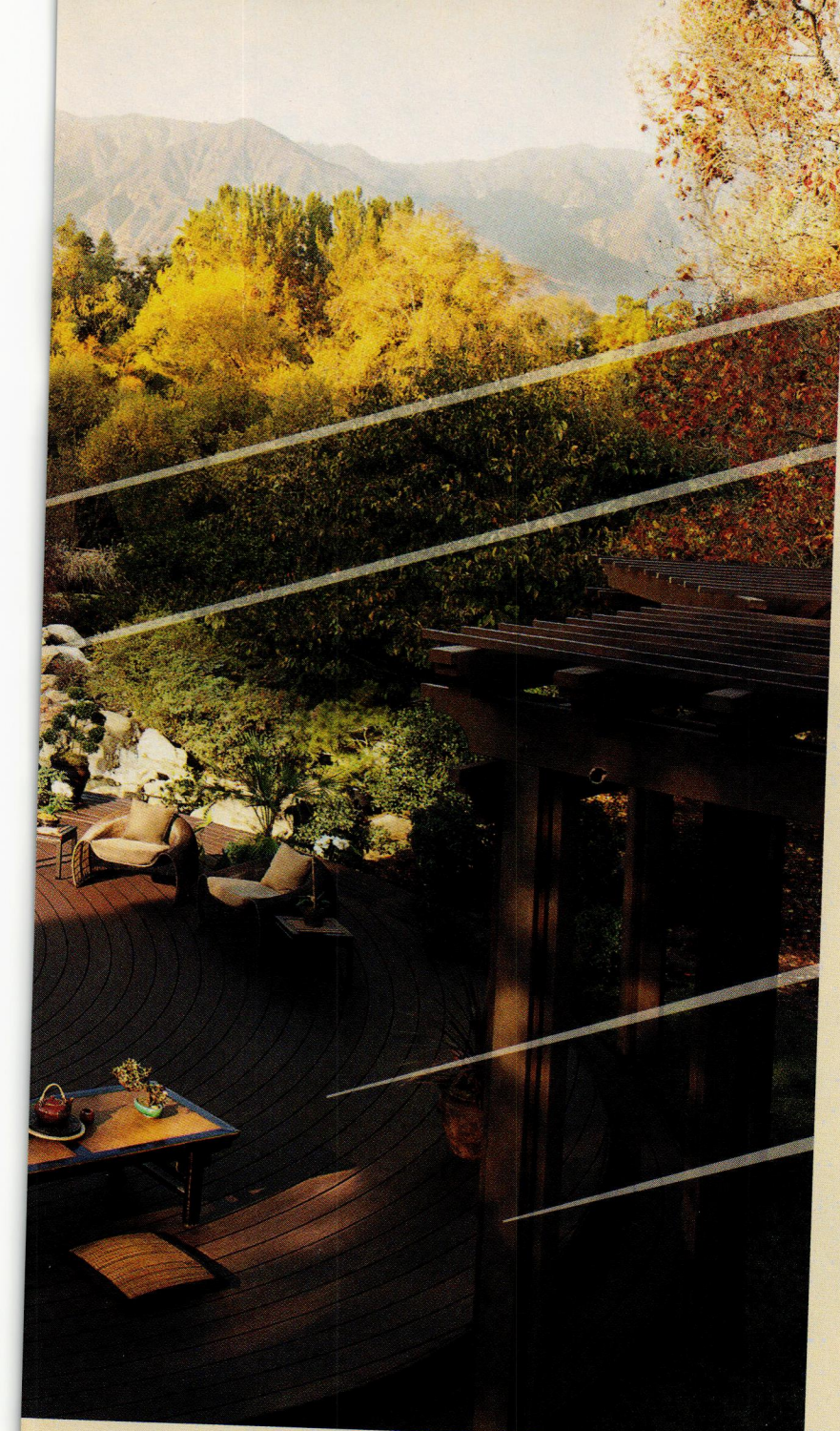
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Cooling Off at the Beach

While sales may slump, cautious builders can benefit

The real estate slowdown will push speculators and part-timers out of the market, but career coastal builders will fare better — and some may even benefit.

That's the still-optimistic consensus of industry observers trying to predict the fallout from the sagging real estate market in formerly hot East and Gulf Coast destinations stretching from Pensacola to Hilton Head to Ocean City.

"The doctors and lawyers who thought, 'I think I'll become a developer in my spare time' — I think all those guys will go by the wayside," says Brad Hunter, an economist at Metrostudy, a Houston-based housing market research firm.

But experienced coastal builders, especially those who have been in the business long enough to remember the lean years that preceded the recent housing boom, "are ready for it and planned ahead, and they're going to be fine," Hunter maintains.

Home and condo sales — and, in some areas, prices — were falling nationwide this past summer, with coastal areas often experiencing the most dramatic declines. In Florida, Naples faced the biggest drop of all the state's Metropolitan Statistical Areas, with single-family home sales falling 51% this past July compared with July 2005, according to the Florida Association of Realtors. In New Jersey, the biggest percentage declines in this year's second quarter compared with last year's occurred at the South Jersey Shore and Cape May. The story was similar in South Carolina, where the Hilton Head and the Myrtle Beach areas had the sharpest drop in home and



ROBIN MICHALS

A proliferation of spec construction has resulted in homes hanging around much longer than builders want. Yet economic experts say demographic trends will favor high-end retirement destinations, and established builders who can insulate themselves from a temporary slowdown will prosper.

condo sales this past July over last July.

"Whenever you see a market heat up, that's the area that's going to feel the most pain when the market cools," notes Phillip Neuhart, an economic analyst at Wachovia Corp. "And we know the coasts were the areas that saw the greatest sales volumes."

Not surprisingly, coastal housing starts also appeared to be slumping. In Palm Beach County, starts declined 27% compared with a year ago county-wide, but they declined 38% east of U.S. Highway One, according to Metrostudy's analysis of that region.

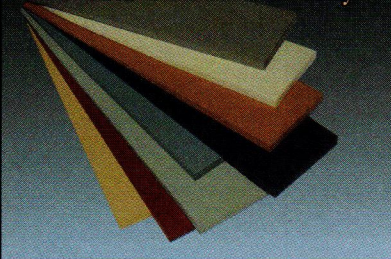
Coastal builders everywhere are

feeling the pinch. Al Zichella, president of the Collier Building Industry Association in Naples, confirms that sales, pre-sales, and inquires are all down for builders. The only number on the rise is cancellations of existing contracts. "Traffic was way down this season and continues to be sluggish," Zichella reports. "Buyers are sitting back and looking for the bottom of the market."

Despite the gloomy numbers now, he was optimistic about Naples in the long term, saying that all demographic trends point to its continued popularity as a high-end retirement destination.

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~ Breakline

He believes the area will rebound once additional inventory is absorbed in what he predicted as one year. Builders, he said, can insulate themselves against the slowdown by discounting homes and condos and buying land as prices fall.

"They should look for land bargains for future replacement parcels and pick them up in a correcting market to offset land deals made at the top of

the market," he advises.

Hunter, of Metrostudy, agrees, saying builders who buy land at bargain-basement prices may wind up benefiting from the downturn. He says caution is the word in today's market. "For seven or eight years, you didn't have to study the market, you just built anything and it sold," he notes. "The key [for builders now] is to do their homework." — *Aaron Hoover*



Currents

NEW ENGLAND: IT'S TIME TO PREPARE

According to a poll by the Insurance Information Institute for seven of the nation's leading insurance companies, New England homeowners are underprepared for the next major tropical storm. The survey evaluated the "Hurricane Readiness Index" of homeowners along the Gulf and Atlantic coasts, asking residents if they had taken eight key preparedness steps, including whether they have an inventory of their possessions, whether they feel they have enough homeowners or federal flood insurance, and whether they have critical documents ready to go in case of evacuation. The steps are considered those that would best position homeowners to recover from a major storm.

A survey-wide index average of 48% indicates that the typical insured homeowner across the Gulf and Atlantic regions has taken half the preparedness steps. Respondents in coastal Louisiana

topped the chart, having taken 60% of the steps. Coastal Mississippi, Alabama, and Georgia respondents have taken 58%, while Floridians also fared better than the national average, with index numbers from 52% to 58%. Those in Connecticut, Maryland, New York, Massachusetts, and Maine have taken only about one-third of the steps, with index ratings from 36% to 39%.

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The site provides descriptions of wall-bracing construction and the associated International Residential Code (IRC) requirements. Developed by wall-bracing experts at APA, the Web site helps people easily understand, design, build, and en-force braced wall systems. The wallbracing.org site includes links to APA's free Wood University course on wall bracing and APA's CAD Web site with downloadable CAD files of wall-bracing details.

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Crime of Opportunity

Gulf Coast reels from copper shortage

A lack of skilled labor, a shortage of materials, chronic delays in the permitting process — as if Gulf Coast builders didn't have enough challenges, some are showing up on job sites to discover they face another hardship: missing copper wire, pipes, and downspouts.

Copper theft from construction sites is a national problem, the result of the soaring price of the metal in recent years. But although no one tracks it geographically, the problem may be particularly prevalent in Mississippi and Louisiana coastal counties ravaged by Hurricane Katrina. There, an abundance of opportunity, a highly mobile population, and a burgeoning scrap metal market are making copper theft common.

"Copper is way up," reports Kenny Hurt, chief investigator for the sheriff's office in Mississippi's Hancock County, home to Katrina-pounded Bay St. Louis and Waveland. "We've had instances where they're going in and just cutting the copper out of the walls where the people have rewired their homes."

The price of copper has quadrupled in the past five years, adds Ken Geremia, a spokesman for the New York-based Copper Development Association. The cause has been high demand from domestic and Chinese building, with trading this fall at over \$3 per pound, says David Behr, owner of MetalPrices.com. "It's a robust economy definitely capped off with China," he notes.



KANTNER & CO

The global demand for copper wire means scraps have instant resale value. This has ignited the theft of materials from job sites nationwide but particularly in the Gulf region devastated by Hurricane Katrina.

Although the value of other metals used in construction has also soared, copper is an enticing target for thieves because "it's 100% recyclable, which means it has value in the marketplace as scrap," Geremia explains.

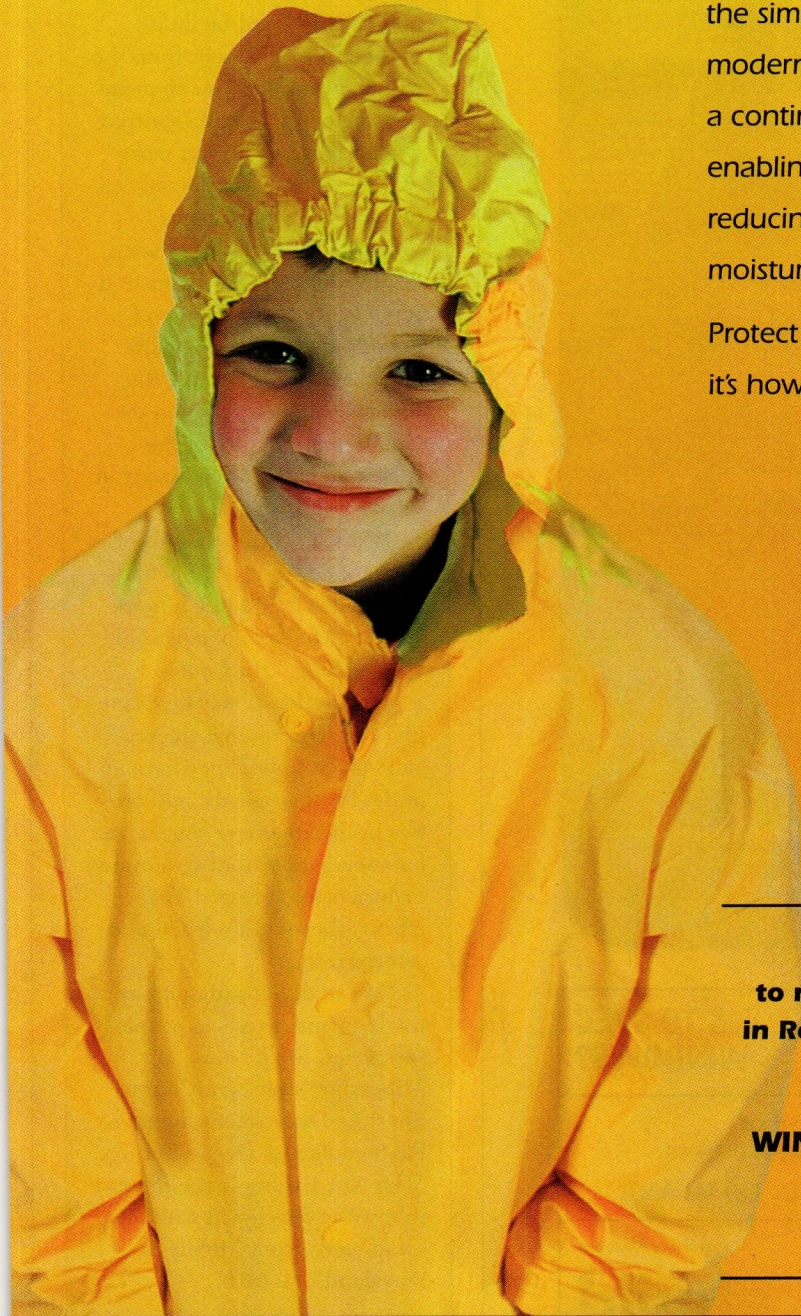
The unique circumstances of the Gulf Coast appear to have exaggerated what Geremia describes as a worldwide problem. For one thing, there is a large amount of construction activity in the Gulf region. For another,

because so much of the area is depopulated, builders often work on job sites where there are no neighbors to keep an eye on things.

"Most of the time it's materials that are left on the job for installation that they [thieves] break in and take," says Capt. Ron Pullen of the sheriff's office in Mississippi's coastal Harrison County. "It's a crime of opportunity.

Although the amounts vary, some thieves make off with thousands of

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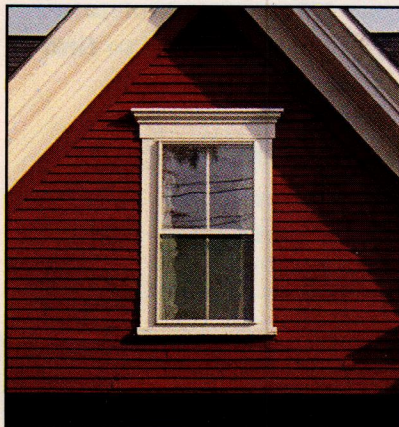
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dollars of copper, according to Pullen and other law enforcement officials in the Gulf Coast area. While construction sites are common targets, other victims include electricity substations as well as telephone and CSX railroad facilities.

The thieves benefit from the abundance of legal scrap metal pouring out of Katrina-spurred demolitions, which can make the line between purloined copper and legitimate copper unusually fuzzy. In other areas of the country, showing up at a scrap yard with hundreds of pounds of copper wire might provoke some questions. But there is so much scrap on the Gulf Coast that all but the largest amounts often attract little attention.

"If I stole 2,000 pounds of copper and I drop 200 pounds off in Slidell, 300 in Gulfport, some in Mobile, nobody would say anything," Hurt notes.

That, at least, may be changing. Recognizing that thieves can't profit unless they have an outlet for their goods, authorities in the area have sought better cooperation from scrap yard managers and owners. The efforts, they say, are leading to some arrests.

"We've developed our way of tracking and arresting people," says Capt. Mick Sears, of Mississippi's Jackson County Sheriff's Department, home to Pascagoula and Ocean Springs. "The No. 1 thing is the rapport that we've developed with local scrap yards from Mobile to Waveland." — A.H.

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Wind-Smart Design

In a blowing rain, it's the details that count

by Gordon Tully

Attention to wind should be a central focus of any coastal design. A smart design in a high-wind zone guides wind around the house as smoothly as possible. Effective features include hipped roofs with a medium slope, short overhangs, and few turbulence-producing obstructions, such as dormers and open porches. And because wind pressure increases with height, a wind-smart design stays low to the ground. In short, good coastal design should be streamlined — the polar opposite of the boxy modernist style and the tall, gable- and porch-encrusted neo-Victorian style. Yet both these styles are immensely popular along the coast, resulting in a head-on collision between design and science.

Wind-smart design involves more than the shape of the house, however. Materials matter, too. To survive strong winds, the building envelope must remain continuous and intact. In a flying debris test, a 2x4 traveling 90 mph goes through a stud wall as if through butter, so you are taking a risk building wood-framed walls in high-wind areas. Instead, consider building in concrete or using reinforced masonry. But above all, include these essential features to keep the basic structure intact:

- windows with special frames and laminated glass
- properly reinforced garage doors
- roof structure with plywood sheathing and engineered fastenings
- firmly nailed roofing (no staples)

Keeping the building dry in the face of wind-driven rains will require much more, however.



FIGURE 1. The key to wind-smart detailing begins with a continuous air barrier. While ordinary housewrap might work, a self-adhesive membrane applied to continuous sheathing is more durable and less likely to leak once installed. In heating climates especially, it's important to use a specially formulated membrane (or comparable spray-on liquid) that will not create an exterior vapor barrier.

PRIMARY AIR-PRESSURE RETARDER

The key to wind-smart detailing begins with a continuous air barrier. In a wood-framed wall without a dedicated air barrier, various solid layers — drywall, sheathing, and cladding — share the job of preventing airflow through the wall. But even with a good air barrier, some of the barrier work will occur in the other layers, because “good” does not mean “perfect.” It is the same with vapor retarders: every layer has a perm rating, but the vapor retarder has the highest perm rating.

Rapid variations in air pressure from gusting will try to flex the air barrier. For housewrap or building paper to act as an air barrier, it must be continuously held

tight against a stiff sheathing. In northern climates, a poly or paper vapor retarder (which typically acts as the primary air barrier) will belly and tear, so a good substitute is the “airtight drywall approach” (ADA) from Canada. This method relies on gaskets and sealants to stop air at the drywall plane. Rigid insulation outside the studs works in any climate. A self-adhesive membrane applied to the sheathing works well, as does a fluid-applied membrane, assuming it is reinforced at gaps in the substrate and does not form an exterior vapor retarder. One example is Grace’s Perm-A-Barrier (Figure 1), which is available in both liquid and membrane formulas (www.na.graceconstruction.com).

PRESSURE-EQUALIZED RAIN SCREEN

Imagine a brick cavity wall in which the brick is made porous by screened vents placed on a 4-foot grid, and with a good air barrier on the inside of the cavity. This creates a *pressure-equalized rain screen*, and here is how it works: The pressure within the cavity will be nearly the same as the outside because of the vents and the air barrier. The brick absorbs the pressure of the wind-driven rain so that any rain that passes through the vents or mortar joints runs down the inside face of the rain screen, where it can drain back out at flashings. There will be no suction through the wall to induce leakage at capillary joints. The air barrier stops any residual water that gets through the rain screen.

ORDINARY RAIN SCREEN

In a typical cavity wall, the outer layer has few vents and becomes a partial air barrier, creating a pressure drop between the outside and the cavity. Although some water will be sucked into the wall on the windward side, this kind of construction is still quite effective

(providing, as always, that you can drain the cavity at the bottom!). Venting the cavity at the top makes it a better rain screen and helps to dry out the cavity.

It is important to block any continuous cavity from horizontal air movement at corners (Figure 2). On the windward side, there will be strong positive pressure in the cavity, while just around the corner will be strong negative pressure. If you don't block the corners, there will be a strong horizontal flow to equalize pressure within the cavity all around the building, sucking water into the cavity on the windward side. This barrier will be under more than twice the normal wind pressure, so it should be sturdy. [For more information, refer to the Canada Mortgage and Housing Corporation (CMHC) "Best Practices Guides," www.cmhc-schl.gc.ca/en/inpr/bude/himu/himu_001.cfm.]

DRAINAGE PLANE

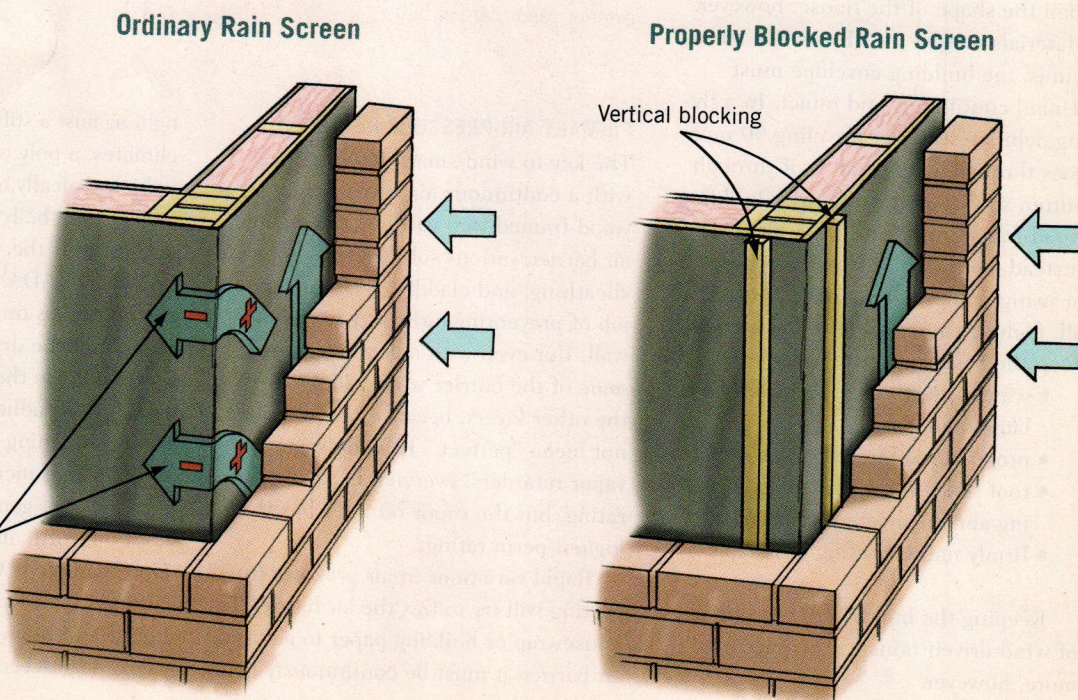
Shrinking the cavity until it is just a gap between adjacent materials results in a *drainage plane* design. Drainage planes can be created by anything that creates

drainage channels, such as Benjamin Obdyke's Home Slicker (www.benjaminobdyke.com) or grooved rigid insulation. Under stucco, one layer of building paper or DuPont's Tyvek StuccoWrap (www2.dupont.com/Tyvek_Construction/en_US) may not keep the stucco separated from the sheathing, so you need to add a second layer of building paper. Under wood or composition cladding, building paper, insulated sheathing, or housewrap will create an adequate drainage plane.

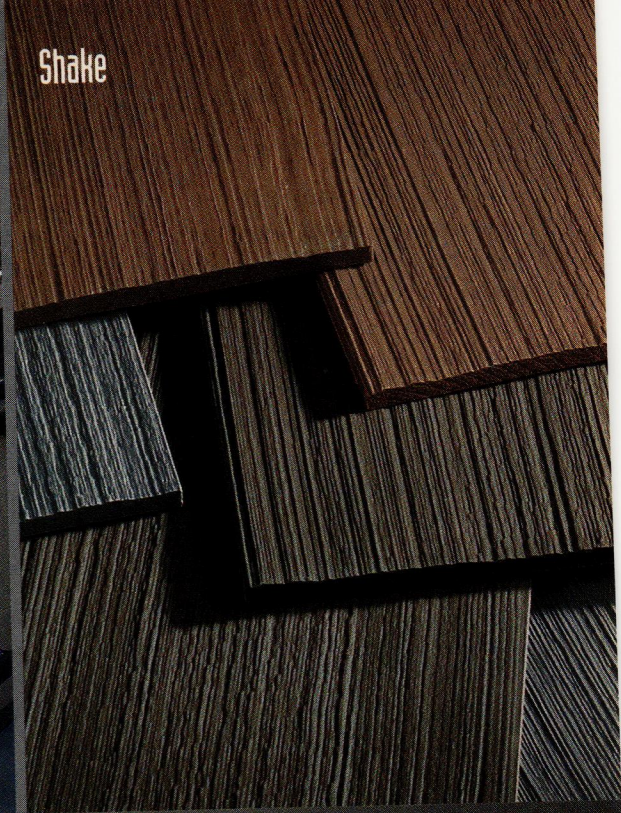
If you omit the drainage plane entirely in wood-frame construction, as when EIFS is applied directly to sheathing, the result will be a crapshoot. In this case, the EIFS must act as both a water barrier and an air barrier, so all the joints around windows and doors are potential routes for water to reach the framing via suction-enhanced capillary joints. You will probably get away with it in dry climates, but not in wet ones, as evidenced by the huge class-action lawsuits in British Columbia and North Carolina, in which leakage through EIFS caused major structural damage in hundreds of homes.

FIGURE 2. The cavity behind brick veneer should be vertically blocked near the corners. Without this blocking, suction pressures will create a strong horizontal flow in an effort to equalize the pressure within the cavity all around the building. This, in turn, will create a strong suction that can draw in water on the windward side.

Strong horizontal pressure flow without blocking



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Slate

Circle #1320

LITTLE DETAILS THAT COUNT

Almost no one in the home-building industry understands how sealant works. Caulk is treated as magic stuff that makes problems go away. Unless it is also an adhesive that holds the surfaces together, sealant cannot be expected to work if it is simply buttered on or squeezed into a joint (Figure 3). Here are the critical details to making a

sealant joint work:

- **Width.** Most joints get bigger and smaller, and when they do, so does the sealant. But a sealant bead can compress and expand only by a percentage of its width: 25% for good sealants and up to 50% or more for super sealants. So, if a joint is likely to get 1/16 inch bigger than when you build it, the bead needs to be 1/8 inch

to 1/4 inch wide. The cheaper the sealant, the bigger the joint.

- **Bonding.** Sealants only work if they bond permanently to both sides of the joint. Every sealant bonds to certain materials and not to others, so you must pick one that works for both materials. When a bead loses its bond, it invites water in by capillary action, which is made worse by wind-driven suction. In some cases, you need to prime the material to create a bond.

- **Backing.** A sealant bead needs to be about square, and must not bond to the back of the joint. These requirements can be met for most sealants by filling the joint behind the sealant bead with a "backer rod" made of polyethylene foam.

Horizontal butt joints left exposed to the weather require regular painting to keep water from invading via capillary action at the joint, or through holes created by toe-nails. A common example occurs in traditional wood railings where the baluster sits on the bottom rail (Figure 4).

Similarly, at the edge of a wet surface (like a windowsill or rail caps), there needs to be a kerf or vertical offset in the bottom surface to prevent water from flowing back into a joint or onto a wall surface. Drip moldings accomplish the same thing in a roof.

Effective Sealant Bend

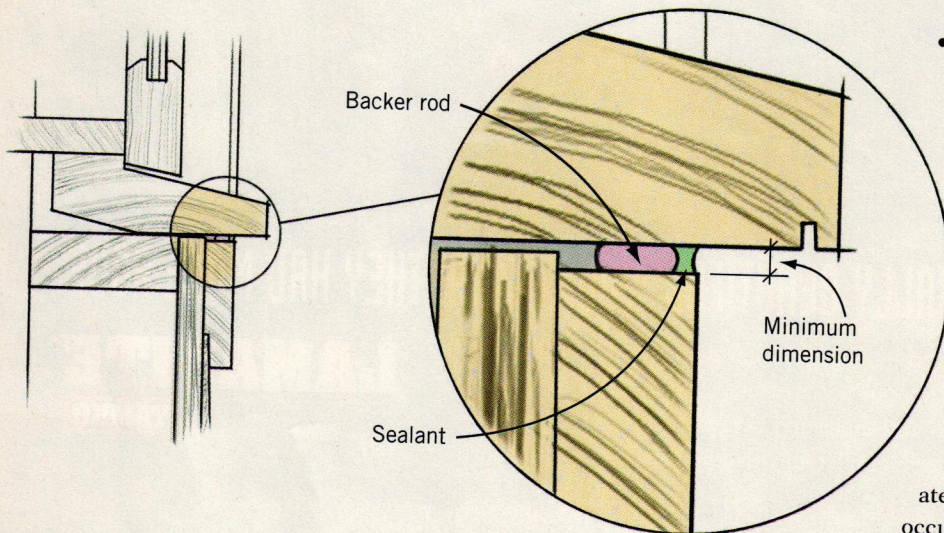
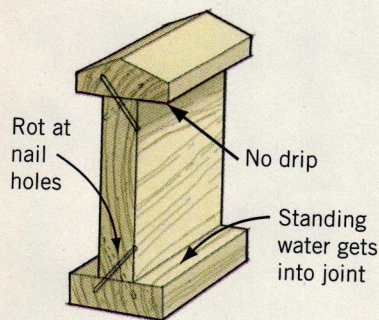


FIGURE 3. For a sophisticated plastic sealant like polyurethane caulk, a properly detailed joint will work, but it must be properly shaped so it can expand and contract as the joint moves. Most important, the bead should bond on only two sides. To prevent it from bonding on the back, a "bond breaker," such as a polyethylene backer rod, is required.

High-Maintenance Handrail



Low-Maintenance Handrail

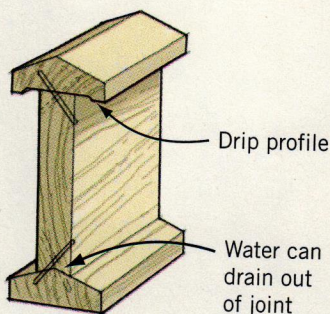


FIGURE 4. Handrails are particularly vulnerable to water penetration and rot out quickly in a coastal environment if detailed improperly (left). Applying the principles of good design (right), drip-edges and a drainable joint to flow water away will help reduce maintenance while still preserving a traditional look.

ROOFS

Lost in the discussion of rain screens and drainage planes is the roof, which can be the most vulnerable part of the envelope. Roofs have their own set of requirements, including finding some way to maintain the continuity of the air barrier at the eaves. They deserve a discussion of their own. — Gordon Tully is an architect in Norwalk, Conn. He teaches a summer executive education course at the Harvard Graduate School of Design.



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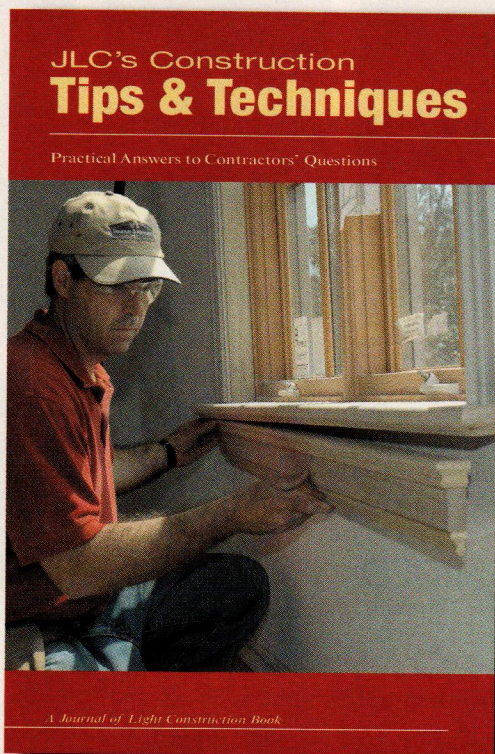
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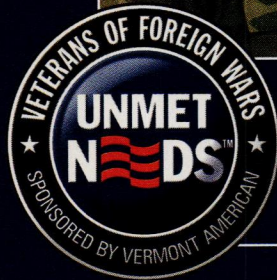
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Classic Columns

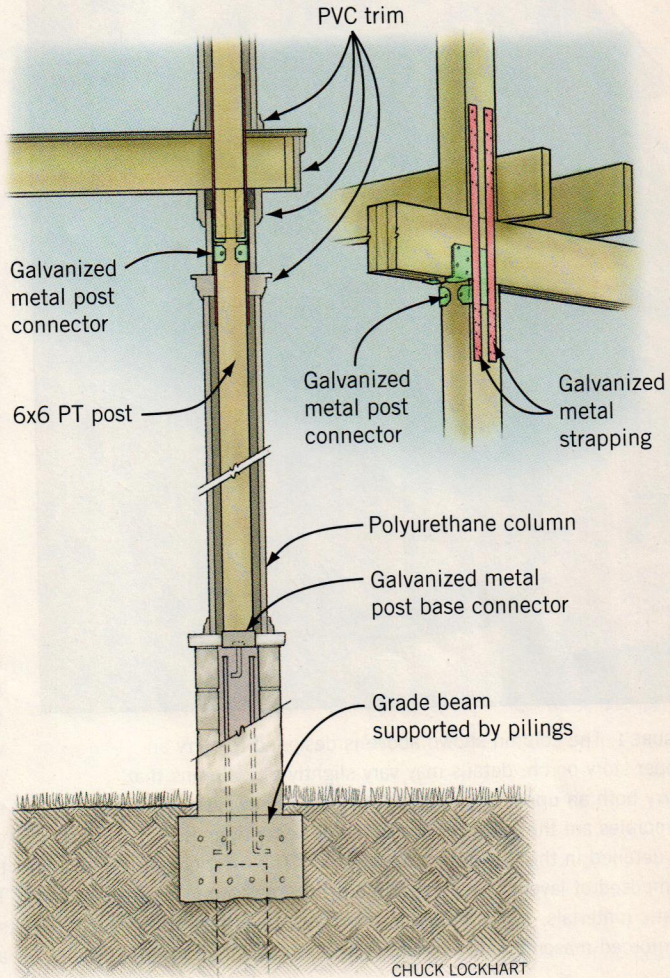
Q: Along the Jersey shore, porches are a common feature on most new houses. These days, many builders here are using Fypon columns that get slipped over pressure-treated posts. My concern is with the structural connections at the top and bottom. Most guys are just toenailing the base into a doubled-up rim joist on the deck and throwing a couple pieces of metal strapping over the girder to secure the tops. Is that enough to hold the porch in place during high winds?

A: A covered porch detailed for coastal zones must resist several powerful forces:

- Porch columns must be designed to resist lateral loads from surge or flooding.
- The columns and beams need to resist wind uplift loads as well as gravity loads.

- Because porches are exposed to the elements, their delicate details take a beating from sun, wind, and rain. At their best, they need to match customer expectations for a durable, low-maintenance weather exterior.

Contractor Smokey Saduk of the New Jersey beachfront building firm Haffelfinger and Standeven recently showed



CHUCK LOCKHART

Coastal Contractor the porch column assembly he uses on the company's custom homes. He, too, relies on Fypon polyurethane columns, but he also opts for other advanced synthetics, including masonry column bases, PVC-clad rail systems, and custom-tooled Azek trim (Figure 1, next page). All these materials have a good track record for standing up to the coast's continual salt- and sand-laden winds, with minimal use of caulking or paint.

Sited on sandy barrier islands, the houses Haffelfinger and Standeven builds typically rest on



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FIGURE 1. The column shown above is designed to carry an upper-story porch; details may vary slightly for columns that carry both an upper deck and a lower deck. However, the principles are the same for any porch/deck configuration, as detailed in the illustration on page 27: The exteriors are composed of layered, weather-tolerant, low-maintenance synthetic materials, while the inner structures are strengthened by reinforced masonry, engineered connectors, and treated wood.

deep treated-wood piling foundations, tied together at the top with a reinforced concrete grade-beam grid. These houses are anchored to the foundation grids by 4-foot concrete block stem walls, with fully grouted cores and rebar reinforcement. Stand-alone piers for porch columns are built into the foundation gridwork. Above the grade beam, each column base is built with 16-inch concrete block, reinforced with rebar and concrete grout, and tied to the underlying foundation grid with anchor bolts, as shown (**Figure 2**). The 4-foot block piers receive a concrete stucco parge.

Columns for second-story decks often sit directly on the block piers. But first, a bluestone cap stone is set on each pier, with a 6-inch-square hole cut in its center to receive



FIGURE 2. Column bases are tied to the foundation grid below grade. Above grade, Saduk's crews lay up 4-foot piers of 16-inch-square concrete masonry block, with fully grouted cores. Capping the block pier is a 20-inch-square bluestone slab, with a 6-inch-square hole in the center to receive the base of a 6x6 treated-wood post. The anchor bolt (top, center) will hold down a galvanized steel engineered standoff post base connector for securely attaching the wood post to the concrete pier. This block pier has already received a stucco scratch coat and will be given additional cementitious finish coats.

the base of a 6x6 pressure-treated wood post. The foot of each wood post is anchored in a galvanized steel post base connector, which restrains the post from moving either side to side or up and down.

To construct the porch assembly, explains Saduk, the crew first frames up the porch beam and porch floor, supporting the whole assembly with temporary posts. Then the synthetic marble columns with their base and capital moldings have to be sleeved over their wood-post structural cores. The framers set the whole post assembly in place, fitting the foot of the wooden post into its connector and fastening its top to the porch beam above with framing connectors and steel straps before removing the temporary



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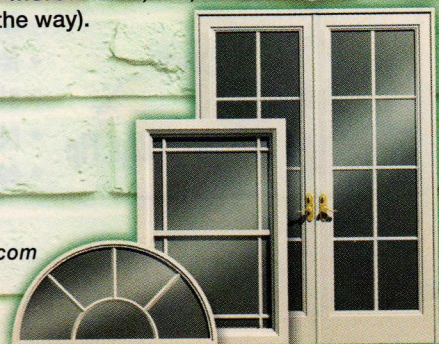
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posts. Once the porch is trimmed out in Azek, and the Fypon base and capital moldings are secured with screws, the underlying wood structure disappears, completely wrapped in durable synthetic finish materials (**Figure 3**).

Porch decks form an important part of the weather-resisting system too. Deck floors are fully sheathed with 3/4-inch plywood, then waterproofed with Vortex spray-applied polyurethane (commonly used as a truck bed liner; available from www.vortexsprayliner.com). The waterproofing extends up exterior walls under the drainage-plane building paper and into rough door frames, as well as up the base of deck posts. When completed, the synthetic-clad porch will invite its owners to enjoy coastal breezes and views, free from worry about leaks, maintenance, or structural integrity. — *Ted Cushman*

(See also "Durable Decks," page 50.)



FIGURE 3. The porch's wood and steel structure is completely hidden once the porch receives its layered trim treatment of Azek ceiling beadboard, tooled Azek trim, and Fypon column base and capital moldings. In addition to its decorative purpose, the completed porch is able to shoulder its part of the design wind loads typical for a coastal home.



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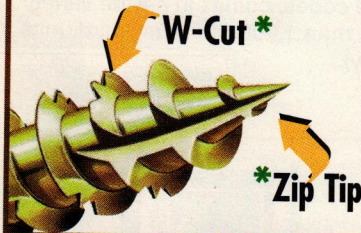
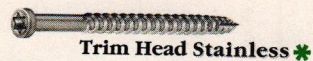
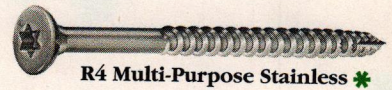
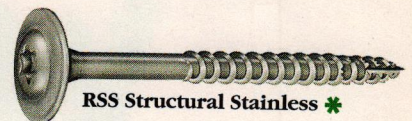
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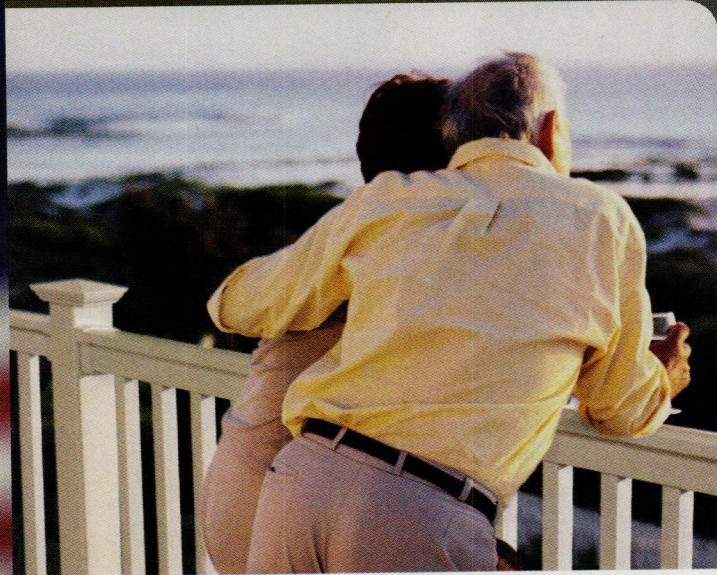
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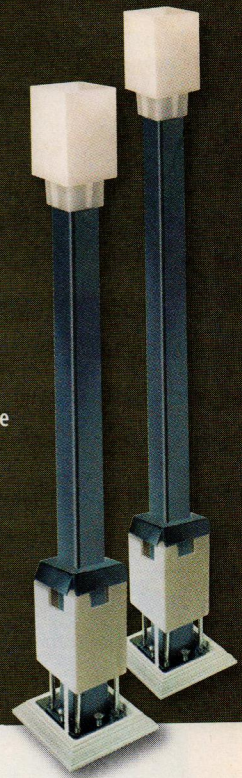
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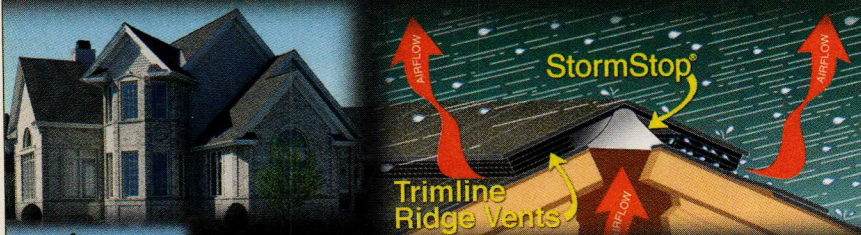
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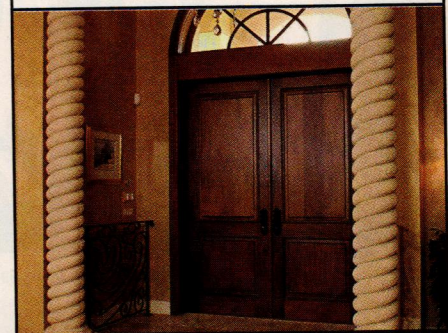
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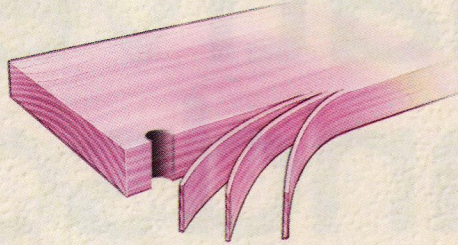


Exterior Premium Pine French Doors 6915AP



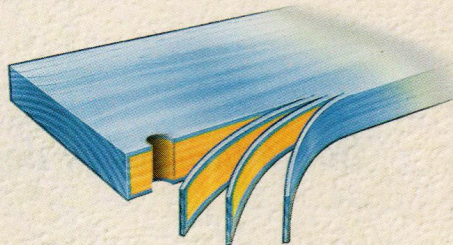
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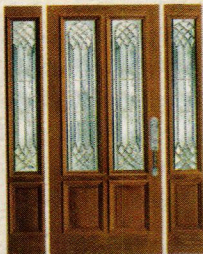


Dip-Treated Wood

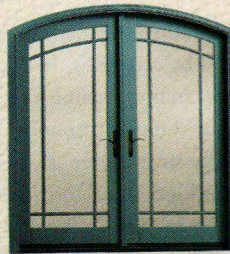
Dip-treated wood is only protected on the surface

NOTE: Colors are used for illustration purposes only; AuraLast wood has a clear pine color.

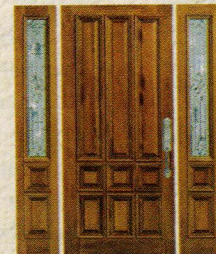
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Native Landscaping for Coastal Homes

Some landscape designs are “greener” than others

by Aaron Hoover

Drawn to the coast for its natural beauty and wildlife, yet increasingly confronted by red tides, fish kills, and contaminated beaches, many coastal residents are deeply concerned about the environment. While they cannot single-handedly save the coast, a growing number are seeking out builders and landscapers who can help them make a difference in their own front yards — by landscaping with environmentally friendly native plants.

In Fort Myers on Florida’s booming southwest coast, Custom Earthworks Design is one of a handful of area design firms that specialize in exclusively or mostly native landscapes. Co-owner Pat McCarley’s nine-year-old company has grown steadily as new residents and home builders have sought him out to green yards and businesses with East Palatka holly, Walter’s

viburnum, dune sunflowers, and other local natives. (See “A Plant Sampler,” page 39.) McCarley says many of his clients “feel like they’re doing something positive for the environment. They say, ‘I can’t go out and save the whales, but I can use native plant species and feel good about it.’”

ECO-FRIENDLY NATIVE PLANTS

Native plants are healthier for the environment than turf and traditional coastal exotics for several reasons, the main one being that they are accustomed to the dry coastal climate and thus require less irrigation. “We get calls all the time complaining about water bills from people who have just incredibly large landscapes on Sanibel or Captiva, where water is expensive,” McCarley says, referring to nearby resort barrier



TODD CAVERLY

A landscape design that relies on a combination of hardscaping and native plant species requires much less water than a traditional lawn, yet withstands salt spray and poor coastal soil conditions.

islands. "If you can get rid of more of your grass, you don't have that issue."

That's a selling point not only to residents but also to local governments seeking to reduce water use and nutrient-rich runoff into bays and estuaries.

Florida is a leader in the native plant trend because of its year-round growing season and 1,197 miles of coastline. As many as 30 of the state's 67 counties now require at least some portion of native plants in new commercial and/or residential landscapes, notes Cammie Donaldson, author of the annual *Native Plant & Service Directory* published by the Association of Florida Native Nurseries (AFNN).

"Water conservation is really driving it," Donaldson says, adding that the association's membership has nearly tripled from about 50 members

ten years ago to 140 today.

Many native plants are also salt-tolerant, making them ideal for beachfront lots. Accustomed to salt spray, they can subsist on poor coastal soil conditions and are resistant to local pests, reducing fertilizers, pesticides, and maintenance. They draw birds and other wildlife that some homeowners yearn to observe. "They even attract more butterflies," McCarley notes. "There are just all kinds of reasons to use them."

Lee County, Fla., where Custom Earthworks is based, requires 75% native plants on new landscapes for commercial development. But that rule is just one motivator for customers of Custom Earthworks, which grew 20% annually in its first five years and now handles about 30 residential and commercial developments annually.

Native Landscaping for Coastal Homes

Landscape designer Pat McCarley used tall buttonwood trees and Washington palms around this backyard pool to screen the neighbor's house.



WHERE LANDSCAPING MEETS HOME BUILDING

Some homeowners contact the company directly, but the firm subcontracts regularly with several custom home builders. McCarley prefers to begin after the home's exterior is completely finished, but he and the firm's three landscape sales designers often put their heads together with builders long before that.

"Because we're responsible for creating the atmosphere around the home, almost every single time our opinion is solicited for things that have to do with the appearance of the home," he says, citing a recent job where he and a contractor decided to add an outside kitchen to spruce up an otherwise unremarkable pool deck area. "We were trying to find ways to enhance the area," he explains. "We were talking about the landscaping but also about the livability of the home."

Lee Staton, a custom home builder and owner and president of Fort Myers-based Nautilus Construction Group, has hired McCarley to landscape at least a dozen of his \$1-million to \$2.5-million homes over the past decade. He says he brings McCarley in "very early" in the process — before construction begins, if possible. That's because it's critical for McCarley to work with the homeowner in choosing a landscape and matching it to the style of the home, a process that is not necessarily rapid or efficient.

"Pat can present different ways of doing it, but they

[the homeowners] need to have time to digest it," Staton said. "They'll get back together and they'll have Pat change the drawings, and then they'll get back together and have Pat change the drawings, and so on."

Once the design is settled, McCarley often needs to start planting before the home is completed so that the end product has a finished look, Staton says. For one house to be finished this summer, McCarley planted four palm trees early in the spring, well before the outside of the home was completed, Staton notes.

Builders also turn to McCarley to solve tricky problems with less-than-ideal lots. For example, with pie-shaped lots, even \$500,000 to \$1-million homes may be close together toward the rear of each lot. Keeping the owners satisfied with their privacy often comes down to good landscaping, McCarley says.

"The owner doesn't want to look at a neighbor's garage, and the neighbor doesn't want to look at him," he says. "You've got to find a way to squeeze in a landscape buffer that will serve the purpose, not be a maintenance nightmare, and complement the home that you're landscaping."

That challenge would be the same for native or non-native plants. But many people underestimate the versatility of natives, often stereotyped as "weedy," McCarley says. In fact, while native species have a



The fishtail fern (left), contrasts with the smaller, fragrant wart fern (right), along a path covered in washed shell. At night, the shell reflects light from the moon and other ambient sources, while the crunch of the shell even helps provide security.

more natural look by definition, they can serve many different tastes and home styles. "We've done native landscapes where they've been very natural, very barrier-island-like. But we've also done 100% native projects that are very formal and elegant" using, for example, royal palm trees.

Staton agrees. His 4,000- to 5,000-square-foot homes tend to be on the formal side, based on classic English, French, and Italian designs. "One thing Pat is able to do," he says, "is incorporate natural or native plants, trees, and bushes in a fashion that looks correct in that caliber of a home."

McCarley says the up-front cost for native landscapes closely mirrors traditional landscapes. Custom Earthworks' prices start at \$15,000 for new homes and \$40,000 for a condo or commercial building, and they climb from there. One residential landscape, on Captiva Island, came to \$90,000. A seaside condo landscape, meanwhile, totaled out at \$150,000. Individual plants run from \$1.50 per plug for common species like dune sunflower to at least \$600 each for slow-growing, 6- to 8-foot buccaneer palms.

Whatever the up-front cost, McCarley emphasizes that native landscapes are less expensive than their counterparts in the long run because of savings in water, fertilization, and maintenance. "For the homeowner, it's cheaper," he says.



In a project awarded first place in a Design with Natives competition for 2005 for the Florida Native Plant Society, McCarley removed sod from around a stormwater pond, and replaced it with maple and bald cypress, pond apple and leather ferns, spike rush, and cordgrass. Other outlying material included oaks, pines, wax myrtles, and muhly grass.

Native Landscaping for Coastal Homes

McCarley's greenery palette contains about 200 plant species, including a few exotics. When he first launched his business in 1997, it was difficult to find many of the plants he needed, but the increase in demand has helped solve that problem. Availability remains an occasional issue, however. This summer, McCarley has had to search hard for mangroves. As he notes, that's ironic, considering that just two decades ago Florida builders and developers were ripping them out by the acre.

"Mangroves are popular because they help to preserve our coastline and they provide fish habitat, so they're in high demand," he says.



Groundcovers of different heights are often used to providing layers of vegetation that won't need to be trimmed frequently and won't upstage or overgrow smaller varieties. Here McCarley accomplishes this with Indian hawthorne (foreground), coontie, and sword fern.

GREEN BUILDING AND NATIVE LANDSCAPING

Statewide in Florida, Custom Earthworks is unusual in its focus on new construction, and native landscapes in general remain "a niche market," says Laurel Schiller, vice president of the Association of Florida Native Nurseries and co-owner of Florida Native Plants, a Sarasota native nursery and landscaping firm.

Tastes are changing, but the process is incremental, and numbers remain small. She describes her typical customers as current Florida residents tired of the constant watering and maintenance that comes with exotic landscapes, as well as environmentally aware baby boomers buying early retirement or second homes.

"They grew up with Earth Day in the school system," she says. "Their whole background is different from the background of the generation before. The generation before ditched the Everglades, drained the rivers, and cleared the land."

That said, she emphasizes that a big part of her work is getting the message out about native plants. Indeed, there's an obvious education gap. Staton, the custom home builder, says his customers usually don't ask for natives but are enthusiastic once they learn of the benefits. "They like seeing what they see, and 'oh, by the way, you don't have to fertilize the hind out of it and you don't have to maintain it every day.' So it's kind of a double attraction," he says.

Schiller says green-oriented customers are not uncommon, but the building community has been slow to catch on. She says she often receives calls from transplants unhappy that a builder or developer has wiped most of their tree canopy and who are hoping Florida Native Plants can help them restore the natural look.

"Our business is about trying to give people the opportunity to live in the backyards of their property," she says. "So much of it is so cleared that they are eight to ten years from a canopy again."

The fast-growing green building trend toward more environmentally benign, energy-efficient homes would seem to present a natural opportunity for native landscaping to move onto center stage. But Schiller worries that there is a "disconnect" between the practices and standards of green building and the potential of native landscapes to enhance "the green effect." Designers and builders will tout thermally efficient windows without considering the benefits of the tree canopy, for example, which can do as much or more to



To create a visual buffer between the beach and the grounds at the Riviera Club on Fort Meyers beach, McCarley used firebush and silver buttonwood (foreground), with coconut palms and cordgrass (background).

reduce home cooling loads.

"People will say, 'We're cutting solar radiation by 30%, and I think, 'A tree on the southwest side will do that too,'" she says.

"I think the building industry has been much more interested in the 'hardscaping' without seeing that it could and should be both," she notes. "The savings will be much greater if you're using old Florida landscaping techniques that cool and shade." ~

Aaron Hoover writes on science and the environment from his home in Gainesville, Fla., and is a regular contributor to Coastal Contractor. Photos courtesy of Custom Earthworks Design except as noted.

A PLANT SAMPLER

by Laurel Schiller, Florida Native Plants

Bald cypress (*Taxodium distichum*)

Buccaneer palms (*Pseudophoenix sargentii*)

Buttonwood: green (*Conocarpus erectus*) and silver (*C. erectus* var. *sericeus*)

Coconut palm (non-native): *Cocos nucifera* (cultivar 'Maypan' recommend as resistant to lethal yellowing disease)

Coontie (*Zamia pumila*)

Cordgrasses: saltmarsh or smooth cordgrass (*Spartina alterniflora* var. *glabra*); saltmeadow cordgrass (*S. patens*); sand cordgrass (*S. bakeri*)

Dune sunflower: East Coast beach dune sunflower (*Helianthus debilis debilis*); West Coast beach dune sunflower (*H. debilis vestitus*); cucumberleaf dune sunflower (*H. debilis cucumerifolius*)

East Palatka holly (*Ilex x attenuata* 'East Palatka')

Firebush (red flowers are butterfly favorites): *Hamelia patens*

Fishtail Boston fern (non-native): *Nephrolepis falcata* f. *furcans*

Indian hawthorne (non-native): *Raphiolepis indica* 'Alba' has white flowers; *R. indica* 'Majestic Beauty' has pink flowers and is resistant to black leafspot; *R. indica* 'Rosea' has darker pink flowers

Leather ferns (*Acrostichum danaeifolium*)

Mangroves: red mangrove (*Rhizophora mangle*); black mangrove (*Avicennia germinans*); white mangrove (*Laguncularia racemosa*)

Muhly grass (*Muhlenbergia capillaris*)

Oaks: live oak (*Quercus virginiana*); laurel oak (*Q. laurifolia*); sand live oak (*Q. geminata*)

Pines: slash pine (*Pinus elliottii*); longleaf pine (*P. palustris*); loblolly pine (*P. taeda*)

Pond apple (*Annona glabra*)

Royal palm (*Roystonea* spp.)

Southern wax myrtle (*Myrica cerifera*)

Spike rush (*Eleocharis* spp.)

Sword fern (*Nephrolepis exaltata*)

Walter's viburnum (*Viburnum obovatum*)

Wart fern (non-native): *Phymatosorus scolopendrium*

Washington palm (non-native): *Washingtonia robusta*

Robust Walls

At the right thickness and with the right details, rigid foam on walls provides a strong defense against moisture

by Ted Cushman

R Because of its versatility and convenience, rigid foam sheathing has become more and more common throughout the U.S. Contributing anywhere from R-3 to R-7.5 per inch, sheet foam is a handy way to boost the wall's total R-value without adding too much thickness. But foam sheathing does more than simply improve the thermal performance of a building: Located just inboard of the wall cladding, sheet foam can also function well as an augmented drainage plane to help keep wind-blown water out of walls, and it can act as both an air barrier and as a vapor barrier to defend against the intrusion of air and water vapor. These properties make it a good choice in most coastal climates — but only if you get the details right. A foam-sheathed wall system has to

be designed and detailed with all functions in mind, taking into account the site's climate and weather exposure.

INSULATING VALUE

The various foam products on the market have different R-values:

Expanded polystyrene (EPS), an open-cell "thermoplastic" foam that melts at high temperatures, is made by expanding polystyrene beads with steam inside a mold. Its R-value varies from about R-3.2 to R-4.4 per inch, depending on the density of the plastic and the size of the cracks between the expanded beads (a typical value would be R-3.9).

Extruded polystyrene (XPS) is made with the



Exterior foam serves many functions, providing thermal insulation, enhanced drainage, and protection from air infiltration and water vapor. It's not structural, however, and should be applied over OSB- or plywood-sheathed framing.

PHOTOS: CRAIG CAULKINS

same thermoplastic material, but the molten foam is squeezed through an extruder to harden into sheets. With closed cells and with no gaps or cracks, an inch of XPS reaches an R-value of R-4.6 to R-5 (1-inch-thick R-5 sheets are a common product).

Polyisocyanurate (PIR) is a "thermoset" plastic that cures by chemical reaction and won't melt (although at very high temperatures it will char and burn). Typical polyiso sheets with foil facings stabilize at R-6.5 per inch.

When you're designing a wall for thermal performance, foam sheathing gives you lots of flexibility. Homes in the Houston, Texas, market, for instance, are often built with $\frac{3}{8}$ -inch XPS sheathing over an R-11 or R-13 fiberglass-insu-

lated stud wall, for an R-13 to R-15 assembly. But a superinsulated solar house in coastal Maine might use 2x6 framing with R-19 or R-21 cavity insulation and 2-inch R-13 sheets of foil-faced PIR, for a wall system rated at R-32 or R-34. Between these extremes lie a whole range of choices, with more than one way to meet or exceed energy-code R-value minimums.

VAPOR PERMEABILITY

In addition to being a good insulator, foam sheathing resists vapor diffusion. Permeability varies — EPS is the most vapor-permeable and foil-faced PIR the least — but any foam you apply over the wall studs or wall sheathing amounts to an exterior vapor retarder.

Robust Walls

Vapor retarders can be problematic. They work well when kept on the warm side of the wall, so that any vapor they stop will stay warm and won't condense into liquid water. But predicting which side of the wall is the warm side can be tricky when the climate changes. Water vapor wants to move from warm, high-humidity areas to cool, low-humidity areas, so the direction of the vapor drive can reverse when the temperature and humidity change.

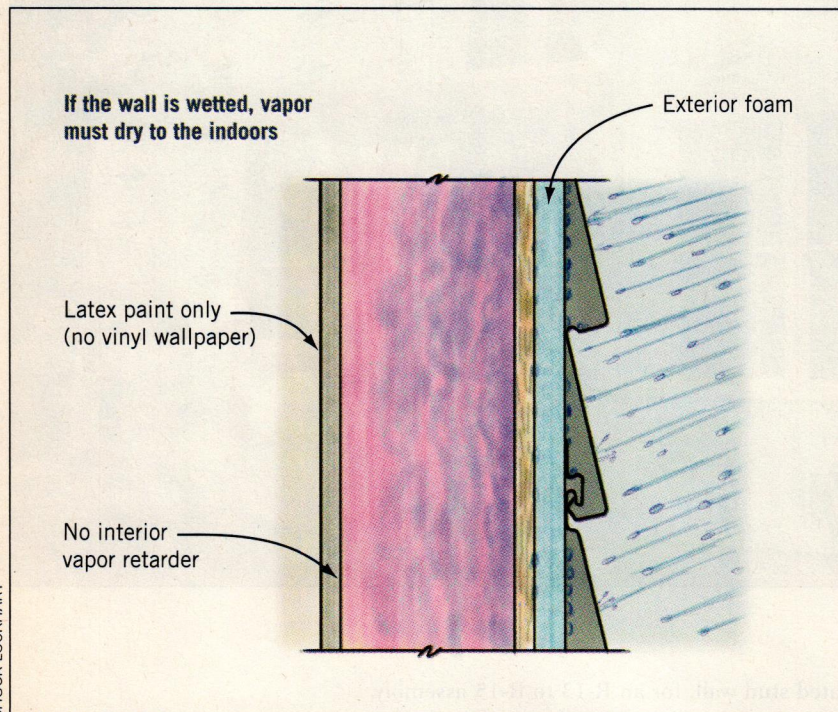


FIGURE 1. It's inevitable that walls will get wet at some point — either during construction, from wind-driven rain, from a leak or a flood, or from elevated humidity levels. For this reason, all walls must be able to dry. With foam on the exterior, the only place to dry is to the inside, so it's critical that no poly vapor retarder or vinyl wallpaper be installed on the interior and that the wall be painted with a breathable latex paint.

Foam, which acts as a vapor retarder, can work on the exterior in any climate, says building scientist Joe Lstiburek, as long as the foam's R-value is matched to outdoor conditions — and as long as the wall's interior face is vapor-permeable, so it can dry to the inside.

Match R-value to climate. In the Deep South, explains Lstiburek, an exterior vapor barrier works even if it's not also an insulator. When you're air conditioning (so the inside is cold and dry and the outside is hot and humid), the vapor barrier on the outside makes a lot of sense. As you move north, conditions change: Homes inte-

riors are heated, and the outdoor design temperatures grow progressively colder. "At some point, the back side of the exterior foam [facing the interior] is going to accumulate or condense water in the wintertime," observes Lstiburek. "So we want to increase the thermal resistance of that layer, in order to prevent condensation." The foam must be thick enough to insulate the back side, keeping it above the dew point. "The farther north you go, the colder the outdoor temperature, the greater the R-value required, and the thicker the foam has to be. It's simple," says Lstiburek.

Dryable to the inside. Just as important, a wall should not have two vapor barriers, because that could trap moisture inside the wall (Figure 1). So if insulating sheathing is used, no poly vapor barrier should be attached to interior wall faces. But in very cold climates, says Lstiburek, Kraft-paper-faced batts are recommended. These facings are semipermeable, so they will slow vapor intrusion into the wall while still allowing moisture to escape into the heated space.

FOAM THICKNESS

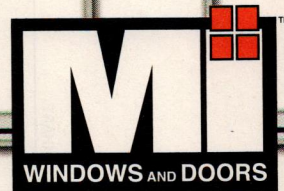
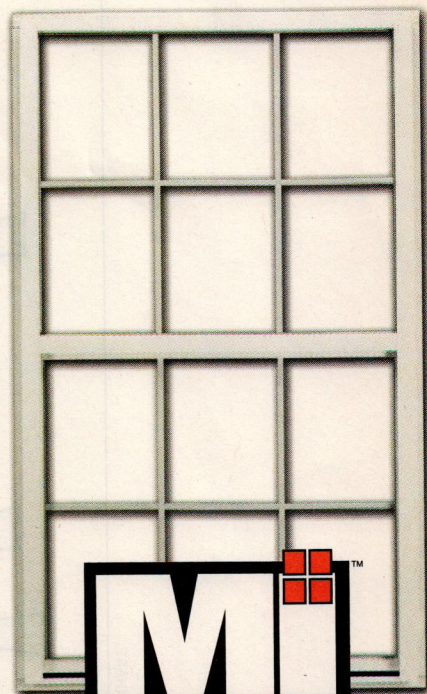
How thick should the foam be? That depends on the climate. In the most general terms, an inch or less of XPS will probably work anywhere south of Long Island. From Rhode Island through Maine, you might need to use an inch of PIR (R-6.5) or 1½ inches of XPS (R-7.5) on a 2x6 wall. Of course, the thicker the foam, the more energy efficient the wall and the safer it is against condensation.

Lstiburek's organization, Building Science Corp., has spent years running detailed computer simulations to predict moisture conditions within walls and experimenting with different wall assemblies to verify the calculations. Eventually, the group settled on a simple way to specify exterior foam thickness: "You take the average temperature of the three coldest months of the year in your location," says Lstiburek. "Take the average temperature for December, the average temperature for January, and the average temperature for February — and you average those, and use that average as your design temperature for outside. You set your interior design condition as 70°F and 35% relative humidity. Then you do a

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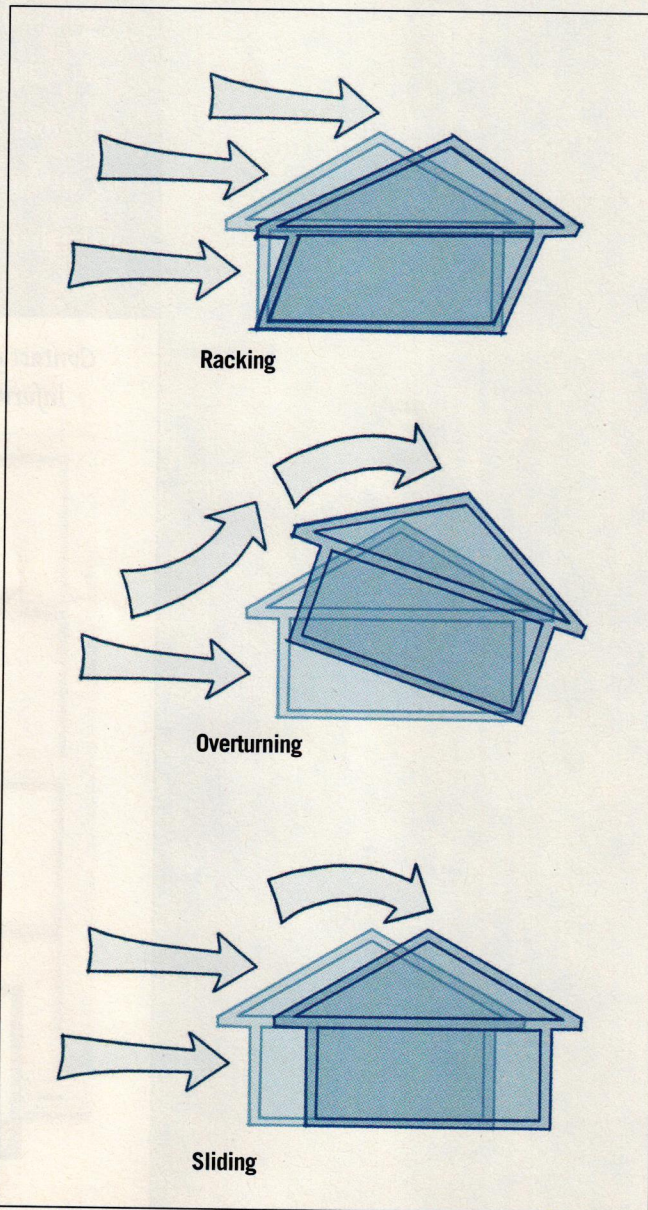
Robust Walls

simple calculation to make sure that the condensing surface doesn't drop below the dew point. As long as you don't see 100% relative humidity at the interface between the foam and the cavity insulation, you won't have condensation on the back side of the sheathing." (See "Calculating Foam Thickness," next page.)

Lstiburek admits that his simple assumptions are not perfectly realistic. "When someone says,

'Yeah, but that's not really what's going on,' well, that's true. But it's a very good approximation — it gets us 98% accuracy with one easy calculation." And he's backed it up with lots of experimental work and lots of very detailed measurements and calculations. Anyone who's not comfortable with it, he says, can always run a more detailed simulation for the particular structure — or simply increase the foam thickness for good measure.

FIGURE 2. To resist the wind, as well as the possibility of a tidal surge, coastal homes must be stiff enough to resist racking, and they must also be anchored against sliding and overturning. The stiffness comes from plywood or OSB sheathing; foam isn't enough.



Fastening foam. The thickness of the foam, of course, affects the fastening of the siding and trim. Foam by itself won't anchor a fastener, so nails and screws have to be long enough to go through the foam into solid wood. According to Lstiburek, the practical limit for normal fastening through foam is between 1 and 1½ inches. "For foam thicker than an inch and a half, I go to 1x4 strapping screwed through the foam into the framing or sheathing behind it," he says. "We've done 8-inch to 10-inch layers of foam that way. The barn at my house [near Boston, Mass.] has 8 inches of foam on the outside, battened on using 12-inch screws."

STRUCTURAL PERFORMANCE

In some parts of the country, you can get away with rigid foam as the main sheathing, with OSB or plywood used only for bracing at wall corners, plus an occasional sheet at mid-wall. But that method won't wash in high-speed wind zones by the ocean (Figure 2). In general, houses near the shore will need full structural panel sheathing under the insulating foam.

Racking resistance. "The main function of the wood structural panel sheathing," explains Joe Lstiburek, "is to provide racking resistance. It also helps support the housewrap. So I don't think you're going to be able to build in [coastal] conditions without sheathing your entire building with plywood or OSB."

CALCULATING FOAM THICKNESS

The illustrations below show the predicted temperatures within walls with insulated vapor-barrier sheathing in Boston, Mass. These predictions are based on a simple calculation described by Joseph Lstiburek of Building Science Corporation:

Interface temp. =

$$\text{Indoor temp.} - [(\text{Indoor temp.} - \text{Outdoor temp.}) \times (\text{Cavity R} / \text{Total R})]$$

The goal here is to find an interface temperature (the temperature at the inside face of the foam) that is *above* the dew point for the indoor conditions. If it falls below the dew point, there is a higher risk that water vapor will condense inside the wall and lead to moisture problems. In that case, increasing the thickness of the foam will better insulate the framed wall and maintain the interface temperature at a higher level.

For this calculation, the indoor conditions are assumed to be

70°F and 35% relative humidity — reasonable values if the rest of the house system is functioning well.

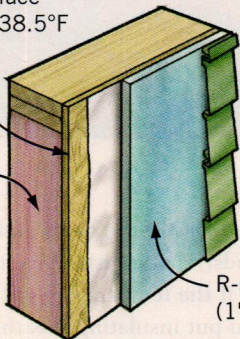
At this temperature and humidity, the dew point is 40°F, so the idea is to choose a foam sheathing R-value that will result in a calculated interface temperature above 40°F.

The outdoor design temperature is found by averaging the temperatures for the three coldest months for the year. For this example, in Boston: 33°F (Dec.), 28°F (Jan.), and 30°F (Feb.), for an average of 30.3°F. (Note: These represent monthly *average* temperatures, not monthly lows or average lows.)

After running the numbers, Case A is found to surpass the energy code, but risks condensation because the vapor-barrier temperature is below the dew point for the design indoor conditions. Case D does not risk condensation, but falls below the R-19 energy-code minimum for wall insulation. All other cases satisfy moisture concerns as well as energy codes.

Predicted interface temperature = 38.5°F

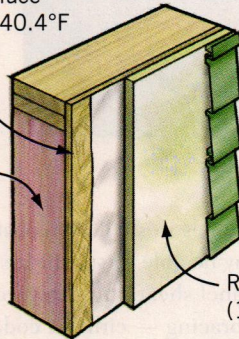
2x6 wall with R-19 cavity insulation



Case A. Total insulation = R-24

Predicted interface temperature = 40.4°F

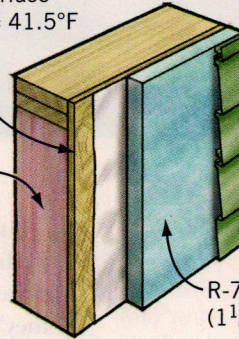
2x6 wall with R-19 cavity insulation



Case B. Total insulation = R-25.5

Predicted interface temperature = 41.5°F

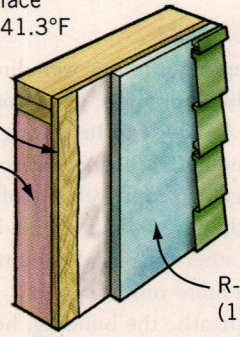
2x6 wall with R-19 cavity insulation



Case C. Total insulation = R-26.5

Predicted interface temperature = 41.3°F

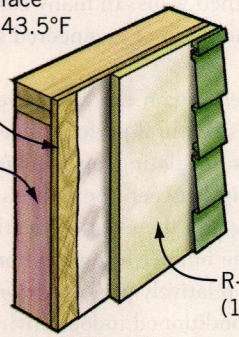
2x4 wall with R-13 cavity insulation



Case D. Total insulation = R-18

Predicted interface temperature = 43.5°F

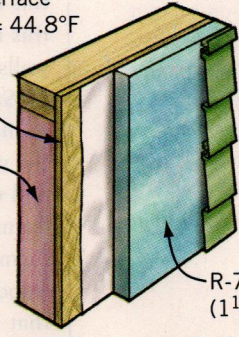
2x4 wall with R-13 cavity insulation



Case E. Total insulation = R-19.5

Predicted interface temperature = 44.8°F

2x4 wall with R-13 cavity insulation



Case F. Total insulation = R-20.5

Robust Walls

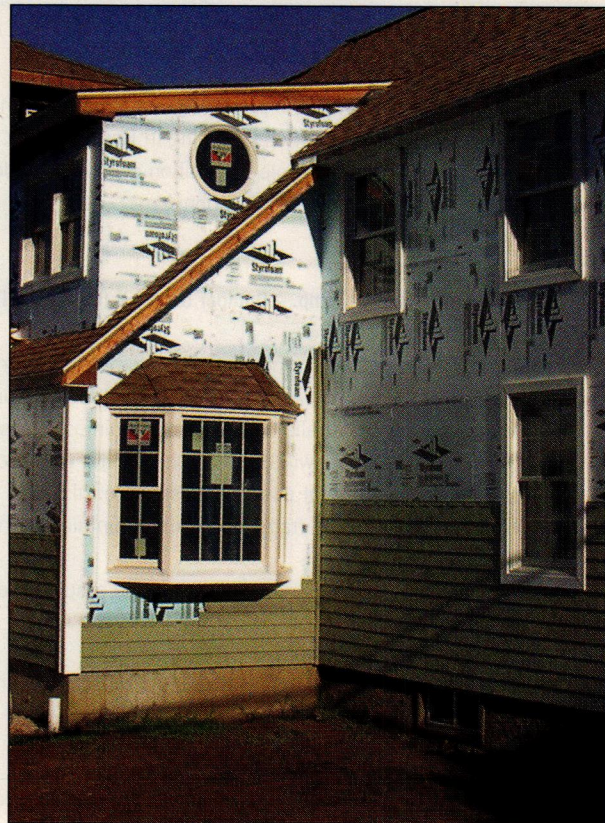


FIGURE 3. Contractor Craig Caulkins of Caulkins Building & Design in Niantic, Conn., routinely applies 1/2-inch or 1-inch Dow Styrofoam to home exteriors under vinyl siding (above right). While foam is water resistant and provides a good barrier against the bulk of the weather, wind-driven rain can find its way around panels and through joints, so Caulkins relies on a housewrap and careful window flashing installed over a fully sheathed structure before installing the foam (above left).

In coastal states, homes in sheltered locations far from the water may be able to substitute foam sheathing for wood-panel sheathing. However, they'll still need wall bracing — either a code-recognized method, or an engineered design (see “Wall Bracing and the IRC,” July/August 2006; www.coastalcontractor.net). The easiest way to do this is with fully sheathed walls. In many cases, this may require the addition of engineered shear walls as well.

Stabilizing the shell. Foam can also have a positive effect on the structural performance of the wall. By placing an insulating, air-blocking, and vapor-blocking skin between the house's framing and sheathing and the exterior weather, foam sheathing lets the builder bring the home's wood structure into a relatively protected zone that is closer to the conditioned indoor environment. Notes Lstiburek: “Wall frames move because of moisture-change differentials between

the inside faces of the studs and the outside face of the studs. That moisture-content difference increases if the temperature difference is greater. When you put insulating sheathing outside, the wall frame sees more constant and uniform conditions, and you actually reduce drywall cracking and building-frame movement.”

DRAINAGE PLANES

Just as important in any wet climate, foam serves as a building's drainage plane for rainwater management. A “Guide to Insulating Sheathing” posted among the technical resources on the buildingscience.com Web site offers several ways to detail the foam skin under siding. But for the severe weather of coastal conditions, Lstiburek calls for a more robust system.

Fully sheathe the building, he says, and then apply a layer of drainable housewrap (Figure 3). “Attach the windows and doors directly to the

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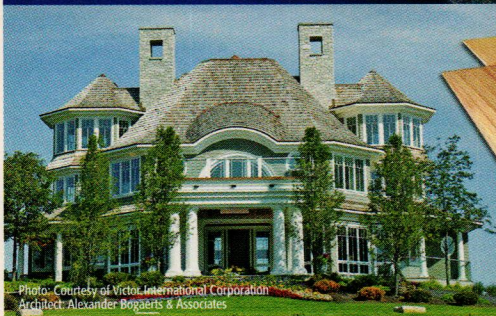


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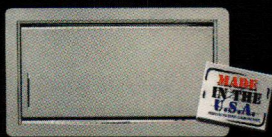


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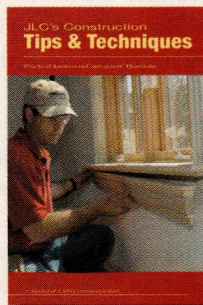
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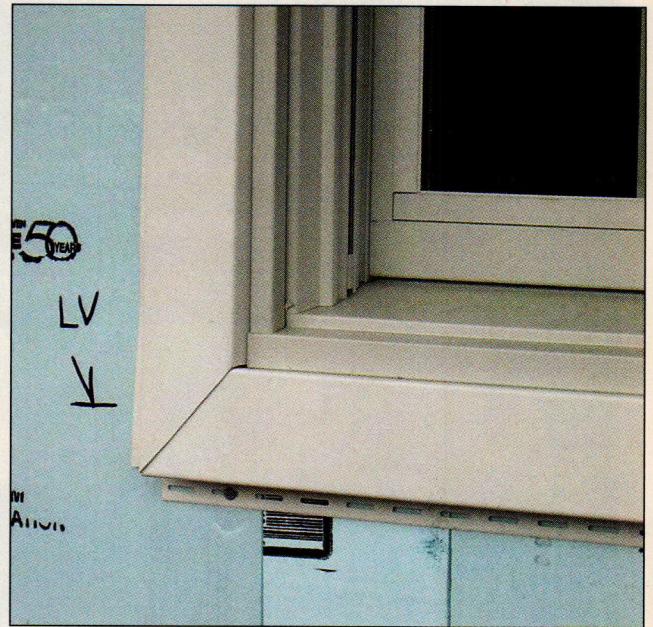


FIGURE 4. In combination with Andersen flanged vinyl windows, says Caulkins, no special furring or attaching method is required: window flanges extend far enough from the wall to cover all foam edges. Crews flash the window openings with self-adhering membrane, fasten the window directly to OSB-sheathed wall, and then apply a two-piece window surround from CertainTeed. The base piece of the window surround is nailed through the foam into the window rough frame (above left), and the matching top piece snaps into place over it (above right).

sheathing, and flash everything just as if you weren't applying the foam." After that, the foam gets installed over the housewrap and flashings (**Figure 4**). Most rainwater will be deflected by the cladding or by the foam sheathing beneath it, says Lstiburek, but any water that penetrates further will be shed by the flashings and housewrap; and any minor, incidental leaks should be able to dry into the conditioned space.

Robust performance. The field experience of others supports Lstiburek's recommendations. Dennis McCoy of Ram Builders, Inc. (www.rambuilders.com), a specialist in the repair of failed stucco-clad walls, says he's observed that foam sheathing can improve the weather performance of wall systems and protect against moisture damage. McCoy's company has torn apart and repaired or rebuilt thousands of moisture-damaged stucco walls in the hot, humid, coastal climate of Houston, Texas. "Walls with foam sheathing, in our experience, show less moisture damage, especially when the interior plastic vapor barrier is omitted from the walls," notes McCoy. Even if there is only one layer of building paper on the wall (good stucco practice requires two layers), walls with foam sheathing generally do

better than walls without, he reports.

Ideally, McCoy would like to see stucco-clad wall frames protected by two layers of building paper and flashing, then a layer of foam, before the lath and stucco are applied. "We call the building paper a secondary weather barrier," he says. "The stucco cladding is the primary weather barrier. But if you include the foam, now you actually have a third weather barrier to help handle rainwater."

In cases he has investigated, McCoy reports, the foam indeed seems to protect against both exterior rain and interior moisture. "The walls don't get condensation on the back side of the OSB sheathing," he says. "And where there are leaks, they seem to be able to dry to the inside as long as there's no plastic vapor barrier in the way. I can't explain the science, but it works. It's a hard sell to customers, especially after all the trouble that has happened with EIFS [exterior insulated finish systems]. But if someone's willing to pay for it, I'd like to put exterior foam insulation on every wall we fix." ~

Ted Cushman reports on the building industry from his home base in Great Barrington, Mass.

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Durable Decks

A visit with three builders who opt for hardwood decking and stainless steel fasteners to withstand the onslaught of sun, salt, and rain

by Charles Wardell

D

Decks and porches on beach homes take the brunt of any storm. Add to that the homeowners' desire for low-maintenance finishes that stand the test of time even in a salt environment, and it's clear that builders have to be especially fussy about their deck materials choices and installation methods.

We asked three East Coast builders who work on waterfront homes what materials and techniques they recommend for exterior decks. All agreed durability is the goal, but they each take a slightly different path to get there.

FIR PREFERRED

Peter Kroll of Cape Painting and Carpentry in North Falmouth, Mass., has been building and renovating homes on Cape Cod for 25 years. Many of these decks lie a few feet from the water. His customers tend to stick with him, many from the beginning of construction, and most of them are neighbors. "We live here, so we need to get things right," he says. In this marketplace, Kroll also has to walk a line between durability and aesthetics. His customers want materials that offer low maintenance but that also look good on an expensive home. In this tradition-bound New England market, that usually means natural wood, not plastic.

Despite the moisture-resistance of composite decking, you won't see it on any of Kroll's projects. "There are too many things that can stain it: hamburger juice, suntan oil — even daily foot traffic can leave stains," Kroll notes. "And once it's stained, the stain is almost impossible to remove."

Most of his deck surfaces are either ipe (Brazilian walnut) or vertical-grain fir. Although ipe stands up well to traffic and turns an appealing silver gray over time, Kroll prefers fir (Figure 1, page 53). "It has a tight grain and comes in a

Deck durability begins with the house design. In hurricane zones, multistory decks over porches or integrated into the foundation footprint have a better chance of withstanding a major storm, while attached decks (inset) are more vulnerable to being ripped apart by storm waves and hurricane-force winds.



ROBIN MICHALS



FEMA/DAVE GATLEY

better mix of lengths," he explains. He insists that a fir deck will last 20 years, and he notes that the quality of the material he's getting these days remains good. Kröll doesn't oil these decks. "I think it's a waste of money. If you put a color on the wood, you're stuck with that color and you have to reapply it every year."

Fasteners. Kröll points out that the durability of an exterior deck includes the fasteners used to build it. Builders take a chance with galvanized fasteners, he says. His crews recently replaced a set of beach

steps where the galvanized fasteners had rusted completely through.

"They don't last," he states.

Instead, Kröll relies on stainless steel nails for fastening deck boards. But he's found there's really no alternative to galvanized framing nails. He never uses nail guns on exterior decks, either. It's tough to get anything but an electrogalvanized nail from local

Durable Decks

suppliers. Kroll maintains these quickly corrode in a salt environment.

Hardware. Ordinary galvanized hardware is problematic as well. Ordinary joist hangers, in particular, quickly corrode outside in a salt environment. This problem has been exacerbated in recent years with the use of ACQ-treated lumber and other copper-based wood treatments. While a "triple zinc" product will hold up longer under coastal exposure conditions, Kroll has begun reinforcing the connection with stainless steel L brackets. He prefers to get other framing hardware from a marine-supply store. In Kroll's experience, marine-grade hardware lasts longer in a coastal environment.

TRUCK TOUGH

Anthony "Smokey" Saduk, project manager of Haffelfinger and Standeven Construction, builds beach homes in the Cape May County area of New Jersey. He stopped using cedar about five years ago because it was getting too soft. Although he likes ipe, he tends to use a more mahogany because it's less costly. He likes the way it looks, and he doesn't mind having to treat it each year. "Any wood will have to be treated," he insists. He uses Cabot's Australian Timber Oil (Figure 2, page 54), which he says "is super durable; it doesn't flake, peel, or yellow."

Saduk is also ambivalent about composites. He tried composite decking when it first hit the market,

Durable Deck Construction

While a coastal deck may feel sturdy when first built, you can be sure the wind, sun, and rain will go to work immediately, pushing and eating away at the fasteners and baking the wood fibers. It doesn't take long under these conditions for structural weaknesses at railing posts and ledger boards to emerge. To ensure a strong deck, follow these basic guidelines:

Rule 1: Never use nails as the attachment to the house. Instead, use lags or through-bolt connections (preferably in conjunction with framing hardware) for all structural connections joining deck to house, girder to column, post to deck, and rail to post.

Even with the right hardware, however, water seeping into these connections will increase the chances for failure over time, cautions Steve Bean of the Southern Pine Council (SPC). The ledger itself is usually treated lumber, explains Bean, but most wall sheathing is not treated and rots relatively quickly.

On an elevated deck, builders must go to extra lengths to protect the joint between the ledger and sheathing (Figure A).

For first-story decks, however, it's better to avoid a ledger board altogether and build a freestanding deck that is not attached

to the house. Bean recommends using a second support beam and posts next to the house instead of a ledger board.

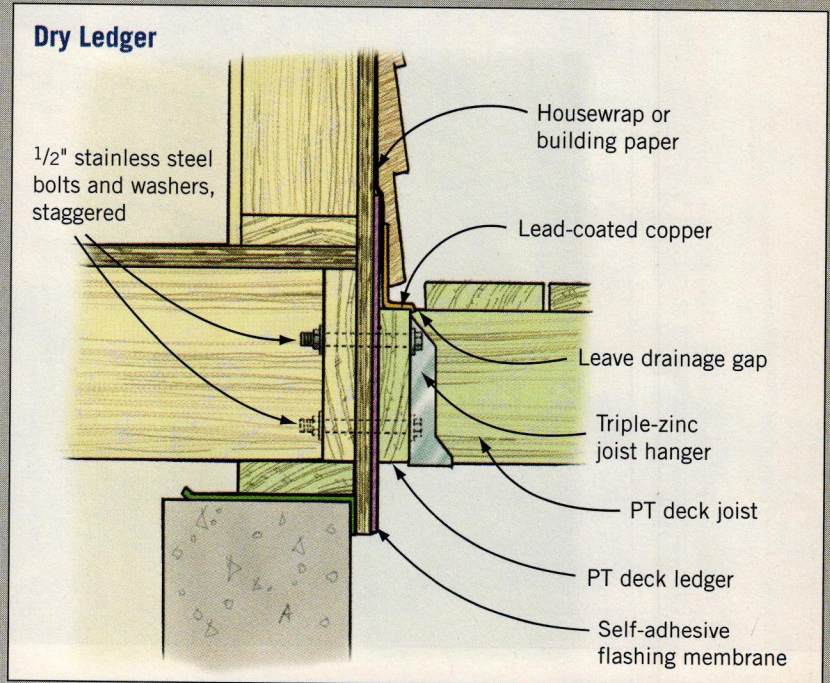
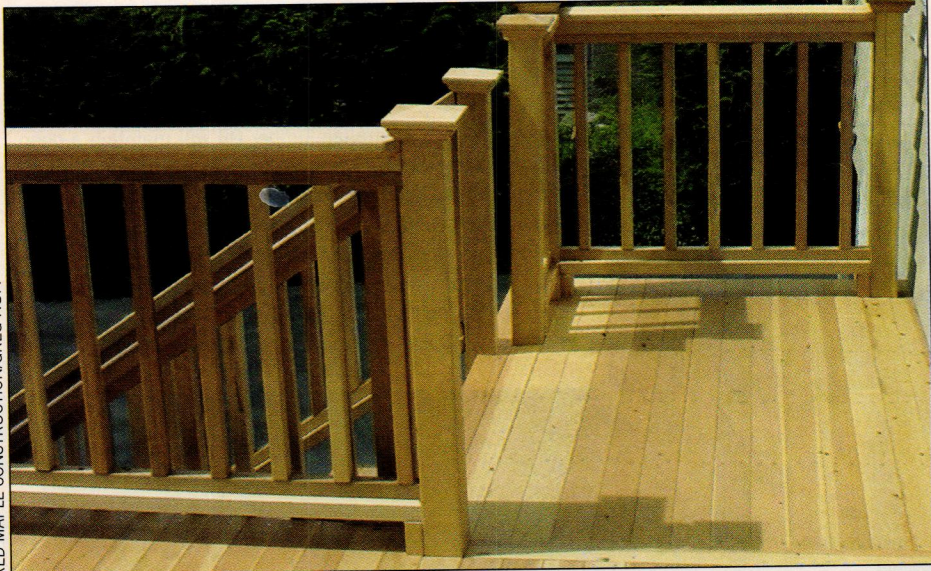


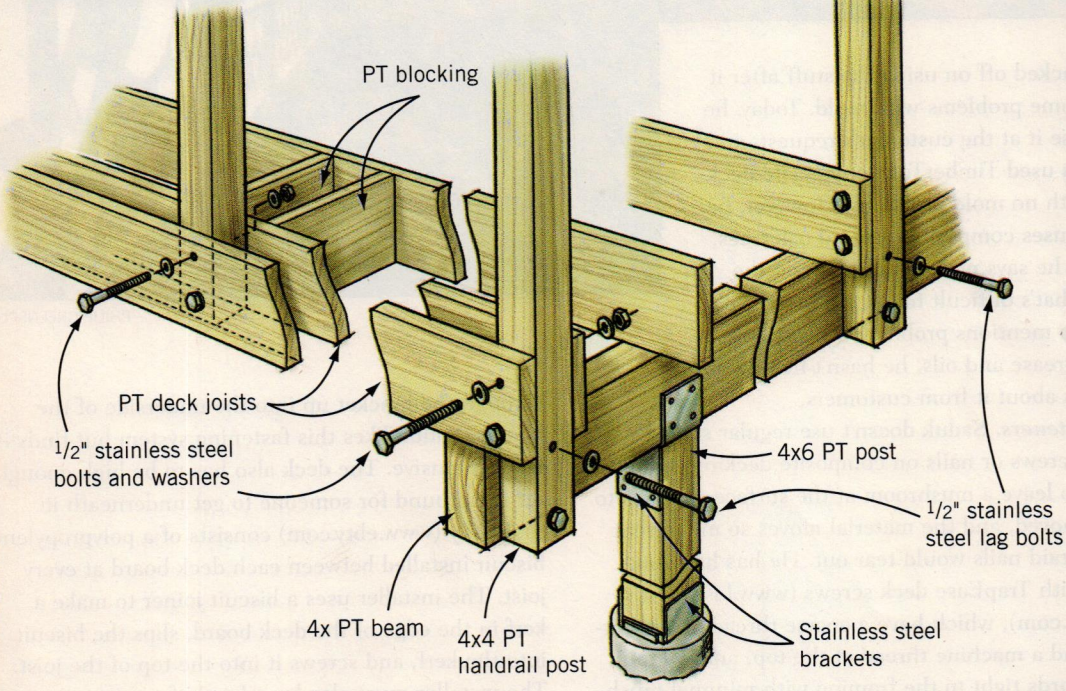
FIGURE A. An elevated deck must be rigorously attached to the building and painstakingly lashed to keep water from seeping between the ledger and the wall sheathing.



RED MAPLE CONSTRUCTION/GREG HUFF

FIGURE 1. On outdoor decks, Peter Kroll of North Falmouth, Mass., prefers vertical-grain fir for its tight grain and the ready availability of mixed lengths. He doesn't oil the wood; instead, he allows it to weather naturally. This reduces the maintenance for clients, as any outdoor finish would have to be reapplied every couple of years in a coastal environment.

Notchless Railing Posts



CHUCK LOCKHART

FIGURE B. Rather than notching railing posts, the Southern Pine Council recommends sandwiching the posts between a double rim joist and through-bolting the connection as shown. On railings running perpendicular to the joists, space posts so that they can be securely bolted to the ends of the joist.

Rule 2: Never notch railing posts. The National Design Specification for Wood Construction, on which the model building codes are based, prohibits notching in the middle third of a post and limits notch depth to one-sixth the depth of the mem-

ber in the outer thirds and one-fourth the depth at the very ends. This amounts to a notch of only 1/2 inch in a 4x4 and 7/8 inch in a 6x6 — hardly worth the effort. And even this notching weakens the post by as much as 40%.

If posts are notched, the cut should be coated with a preservative, such as copper naphthenate, which is yet another reason for avoiding notches altogether. Bean's notchless railing details (Figure B) provide a lasting alternative. — Clayton DeKorne

Durable Decks



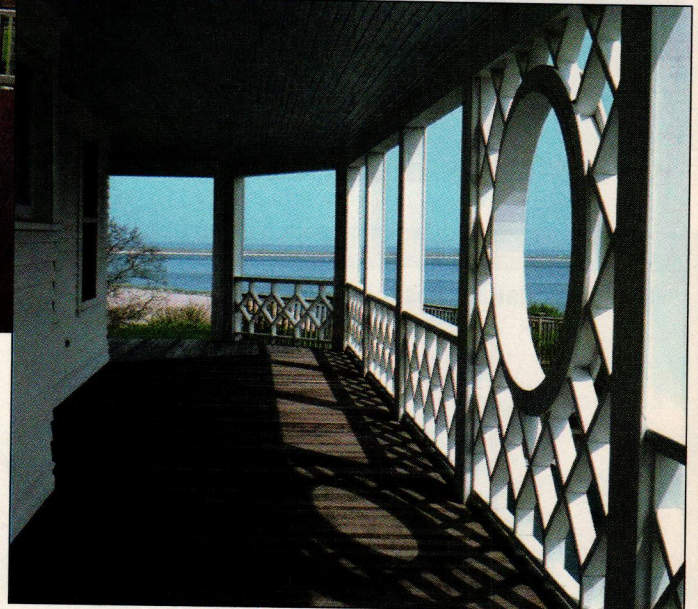
RICK CIOTTI

but backed off on using the stuff after it had some problems with mold. Today, he will use it at the customer's request, and he has used TimberTech composite decking with no mold problems. However, he never uses composites around oak trees, which he says put a black stain on the deck that's difficult to get out. And while he also mentions problems with staining from grease and oils, he hasn't heard complaints about it from customers.

Fasteners. Saduk doesn't use regular stainless steel screws or nails on composite decking: screws tend to leave a mushroom at the surface that has to be removed, and the material moves so much that he's afraid nails would tear out. He has had good luck with TrapEase deck screws (www.fastenmaster.com), which have a coarse thread at the bottom and a machine thread at the top, and will pull the boards tight to the framing with minimal mushrooming. But most of the time when fastening composite decking, Saduk prefers a hidden fastener system. He has used Deckmaster, Eb-Ty, and Tiger Claw systems.

Deckmaster (www.deckmaster.com) uses a metal bracket that's fastened to the top edge of the joists before the decking is installed. The installers then lay the deck boards in place and drive screws

FIGURE 2. Cabot's Australian Timber Oil will maintain a deep tone that contrasts well with white PVC trim (left). However, in a coastal environment, this finish will need to be maintained. If left unfinished, mahogany and ipe will gradually weather to a silver tone but maintain their integrity (below). In 12 years of using unfinished ipe, Eric Borden says he's never seen it appreciably deteriorate. "I suspect it will last much, much longer than it has already," he states.



PHILIP GREENSPUN

through the bracket up into the underside of the boards. Saduk likes this fastening system but finds it labor intensive. The deck also has to be high enough off the ground for someone to get underneath it.

Eb-Ty (www.ebty.com) consists of a polypropylene biscuit installed between each deck board at every joist. The installer uses a biscuit joiner to make a kerf in the edge of the deck board, slips the biscuit into the kerf, and screws it into the top of the joist. The installer must also lay a bead of construction adhesive under each board. Saduk finds Eb-Ty to be about as labor intensive as Deckmaster, but he prefers it because his crew can do all the installation from above. And he says that big decks can be completed quickly: "We set up a table with jigs and someone on the jig table pre-slots all the boards."

Tiger Claw (www.deckfastener.com) relies on 3-inch-long stainless steel fasteners that, like Eb-Ty,

are driven into the edges of the boards and screwed down into the joists. But, unlike Eb-Ty, there's no need to cut slots: prongs on the sides of the fasteners are simply hammered into the edge of the deck board. This sounds easier than it really is, according to Saduk. "The fasteners are made for composites, but composite decking is so hard that we end up beating ourselves to death. It's really a pain; I won't use this fastener again."

Roof decks. Many of Saduk's homes include rooftop decks above living spaces. He used to cover these with fiberglass, but says that after a few years the fiberglass would crack and delaminate, and its color would start to fade. About three years ago he heard about a spray-applied surface that's made by Vortex from a blend of polyurethane and polyurea (www.vortexsprayliner.com). It was developed as a sprayed-on liner for truck beds but has a good track record on pool decks. It creates what Smokey describes as "a 1/4-inch-thick solid rubberized shell," which he now uses it for all of his rooftop decks.

Saduk sprays the Vortex surface over an AdvanTech oriented strand board sheathing, because he finds that AdvanTech doesn't swell as much as conventional OSB or plywood. Before applying the spray, he fills nail holes with auto-body filler, sands them flat, and then preps the surface with a Vortex-supplied sealant. Saduk sprays the surface before the siding goes on, extending it a foot up the wall and structural posts, so it will act as a flashing (Figure 3). The finished surface is coated with a UV inhibitor. He also uses the spray-on liner to mold door pans.

So far, Saduk has been impressed with the material's durability. "If you whack it with a hammer, you will dent the underlying wood but won't tear the surface. And if you step on a roofing nail, the nail head won't go through the material." It's even too tough to cut with a standard utility-knife blade. "The only way to cut it is with a roofing-hook blade."

One drawback to using the material is that the sheathing has to be perfectly dry: you can't install it if there's high humidity, or if it has rained recently. And according to Saduk, it doesn't adhere well to stainless steel flashings, but scuffing them up with a palm or disk sander solves the problem. (Stainless steel nails don't pose a problem because they are set and then filled with auto-body filler.)



ROBIN MICHALS



TED CUSHMAN

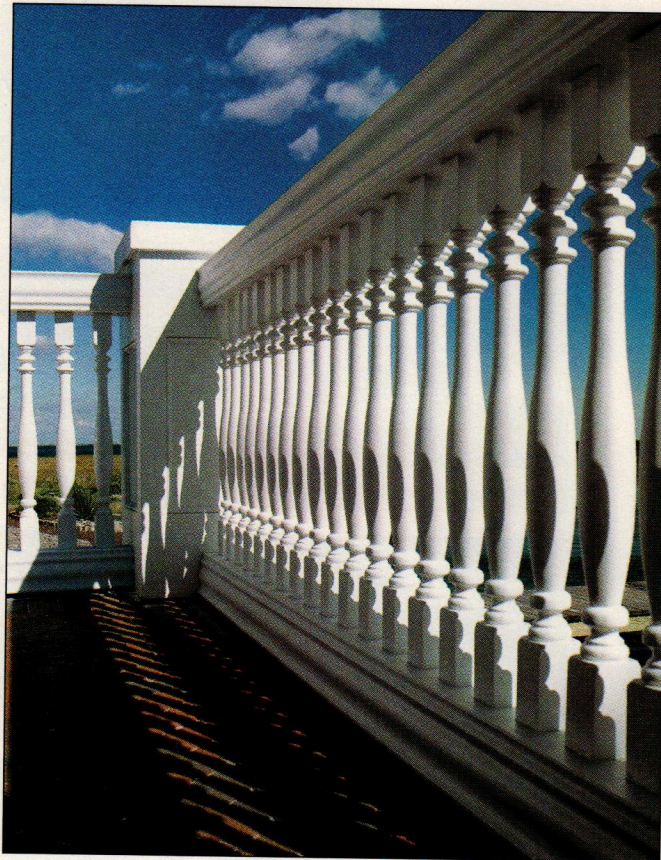
FIGURE 3. Along the East Coast, deck and porch surfaces over living space are usually treated with a fiberglass or polyurethane topping. Typically, the seams of a plywood subdeck get treated with fiberglass tape and Bondo epoxy before the topping is applied (top). Smokey Saduk has had problems with fiberglass toppings cracking and delaminating, so he prefers a spray-on liner over an AdvanTech OSB surface (above). This topping was originally developed as a truck liner, but it also has a good track record on pool decks.

STORM ZONE

Eric Borden of ESB Contracting in Toms River, N.J., has been building vacation homes around the Mantoloking, N.J., area since 1986. He builds on a narrow barrier island that ranges in width from three blocks to 1/2 mile. Most of his homes are traditional

Durable Decks

FIGURE 4. Hefty Fypon balusters cost Eric Borden around \$50 each, while the top and bottom rails each run about \$23 per linear foot. The alternative for Borden is custom-milled redwood or western red cedar balusters at \$35 apiece and handrail at about \$16 per linear foot. However, substantial savings with Fypon comes in the installation. Borden estimates the labor of installing wood is easily 30% more to assemble and finish, and the wood will have to be maintained frequently as well.



Shingle-style with natural wood exteriors, including cedar roofs and siding. Most have white trim and all have some type of exterior decking.

Design and structure. Borden says that the biggest challenge with decks isn't durability but rather local zoning codes. "Zoning codes include raised-level decks in a home's square footage. That means a 2,000-square-foot house with a 500-square-foot raised deck is considered a 2,500-square-foot house." To avoid this penalty, he builds a lot of grade-level decks. "If the deck is on grade level, we can build a bigger house."

Local zoning also gives grade-level decks preference over patios, according to Borden, because decks don't count toward the impervious lot coverage, as pavers or concrete would. The purpose of the restrictions is to reduce storm-water runoff into bays and rivers. Surrounding a house with too much paving would defeat that purpose, while a deck with open spaces between the boards provides a way for water

to drain into the ground around the house.

He says that the code requirements concerning wind uplift are straightforward. He simply has to take steps to securely anchor the deck structure, such as embedding galvanized straps in concrete piers and wrapping them over the deck beams.

However, when a major storm hits, the beach environment can create problems for conventional footings. "Everything we're building on is beach sand, and if it gets waterlogged it acts more like water than sand," he says. Because of this, some houses — and some raised decks — have to be built on piles driven deep into the sand. (Supporting the corners on piles and putting concrete piers between them is often sufficient.) Borden says that pile depth requirements for the deck are based on FEMA regulations, and are the same as for the main house. "In one house the elevation was 12 feet above sea level, so we had to drive the pilings 25 feet deep," he recalls.

Railings. As for finish materials, Borden says that he picks the most durable ones he can, but he makes sure his customers know that any material will weather. "We build

close to the dunes, so when a storm hits it's like putting the house into a sand blaster. I don't care what you build, there's going to be maintenance."

For more durable exteriors, Borden will use composite materials instead of wood if they perform better and don't look like plastic. For instance, he makes deck and porch railings from Fypon (www.fypon.com), a high-density, closed-cell urethane railing system that includes a baluster with a structural pipe going down the middle (Figure 4). The railing and baluster pieces are glued together, then installed on the posts. While Fypon isn't cheap, it's easy to install and requires little or no maintenance over time. "With a wood railing, I guarantee it will eventually rot unless you're constantly maintaining the paint," he predicts. And he says that homeowners never guess that the material isn't wood. "If I custom-turn a cedar baluster and paint it and then put it next to a Fypon railing, they can't tell the difference."

Borden says that common installation problems are the same as with wood, including installers that cut rails too short or drill balusters in the wrong places. "Sitting and reading the instructions is the best 20 minutes you will spend," he advises.

Decking. When it comes to decking, Borden and his customers are still partial to wood, although he finds today's choices less than ideal. "I don't like the cedar they're selling these days, even in the higher grades. It's not as weather resistant as it used to be." He also has been displeased with mahogany. He says that the species of mahogany he gets varies by delivery, so he can't predict how it will perform over time. And he dislikes the fact that mahogany needs to be stained and restained each year in order to maintain its appearance.

One thing Borden likes about ipe, which he has been using for 12 years, is that he gets the same product from all the major distributors. "With ipe I know that the quality will be consistent. This is important, because we maintain a lot of the houses we build. We've had quite a few decks in place for years and we haven't had to do any repairs." While some builders have complained about shrinkage with ipe, Borden doesn't find it to be a problem. He has seen customers get disappointed if they don't understand how the wood will weather, so he makes sure to tell them what to expect. "I show them some weathered samples so they know how it will look in two years if they don't finish it," he says.

As for composites, aesthetics can also be a problem for Borden's customers. "In our high-end \$6-million vacation-home market, people feel like composites are not quite as high end." As with any material, he says that helping customers understand how it weathers can reduce callbacks. "If you educate the client about how the deck will look in a year, you won't get complaints about its appearance."

Fasteners. Although Borden's customers would rather not see fasteners on the deck surface, the fact that he builds a lot of grade-level decks in areas where the zoning requires him to space boards $\frac{3}{8}$ inch apart (in order to allow sand to get through to help maintain the dunes) means he sometimes can't use hidden fasteners.

When he has, he's used the Eb-Ty and Tiger Claw

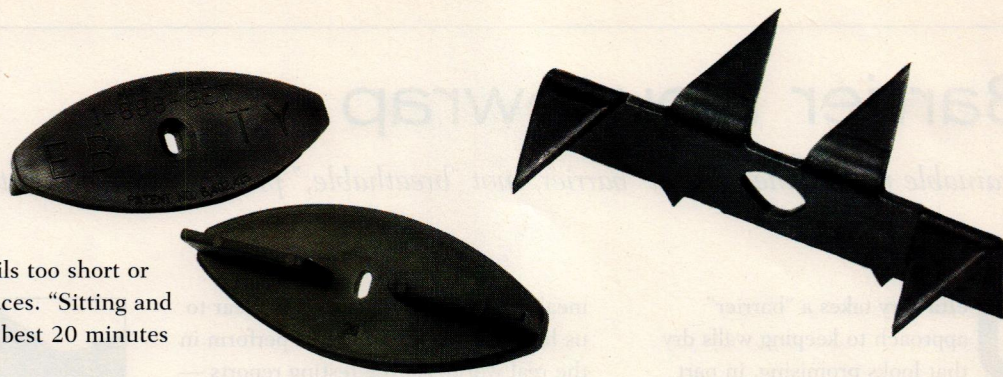


FIGURE 5. Borden relies on hidden deck fasteners when zoning requirements allow. He typically uses Eb-Ty "biscuits" (top left) that get installed in a kerf cut in the edge of a board with a plate joiner, or Tiger Claw fasteners (top right). The Tiger Claw install faster in hardwood, but they're difficult to pound into the edge of composite decking. For composites, it's better to use the decking manufacture's proprietary fasteners, such as those made by Eb-Ty for CorrectDeck (above).

systems (Figure 5). He says that while Tiger Claw is "easier and faster," he has more experience with Eb-Ty. "It's easy once you're used to it," Borden says. "But getting set up with biscuits and learning to use them is more time consuming. It wouldn't be worth it for a small deck." ~

Charles Wardell writes on construction topics from Vineyard Haven, Mass.

Barrier Housewrap

Drainable membrane aims at “barrier,” not “breathable,” protection from moisture

Delta-Dry takes a “barrier” approach to keeping walls dry that looks promising, in part because of the high-level product testing the manufacturer has sought in North America. The concept behind this impermeable, molded-polyethylene weather barrier is that the bumps and channels in its surface create a drain cavity, which dissipates moisture that might accumulate on either side of it. Thus, it provides a drainage plane behind any exterior cladding, and it allows an escape path for water that might condense on the wall side. In theory, it’s a compelling product: an impermeable membrane will have a higher water holdout capacity and resist solar-driven moisture far better than any per-

meable product. But it’s still unclear to us how well the product will perform in the real world. All the testing reports — some of it by top-rated building scientists in the U.S. and Canada — urge that the edges must remain open to allow moisture to escape. But if edges remain open to provide sufficient ventilation behind the membrane, isn’t there an increased chance of wind-driven rain getting in? Clearly, the product’s success will depend on the care taken with installation. While that’s true of any water-resistive barrier, this one definitely bears further scrutiny. For more information, contact Cosella-Dörken Products, 888-433-5824; www.delta-dry.com.



DELTA-DRY

Strong Hold

Ring-shank air nails help resist uplift and shear

Wood-frame construction typically fails under wind loads at fastening points, most often by a nail shank pulling out or material pulling out around the nail head. The **Stanley-Bostitch HurriQuake** nail is a 21-inch plastic-collated air nail designed to resist these common wind failures. According to the manufacturer, the nail’s aggressive ring geometry combined with a nearly 25% larger head provide enough uplift resistance to withstand hurricane winds up to 170 mph. The head of each nail is marked with either an “HQ1” or “HQ2” for easy identifica-

tion during inspections. In addition, the nails are packaged in a stiffer plastic collation strip that reportedly breaks away more effectively as the nail is driven, reducing “flagging” — and thus helping to prevent squeaky floors that result from flagging caught between the sheathing and hardwood flooring. (You’ll still have to make sure the nails are not underdriven, and that the joists are stout enough to resist deflection — the primary causes of squeaky floors.) For more information, contact Stanley Fastening Systems, 800-556-6696; www.bostitch.com.

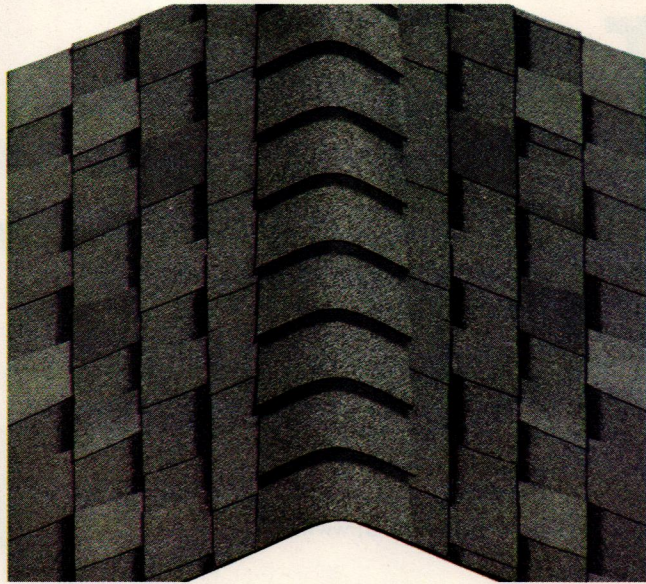


HURRIQUAKE

High-Performance Hips

Shadow line on hip matches field shingles of wind-rated roofing

Atlas Roofing has introduced **StormMaster Pro-Cut Hip & Ridge** shingles: pretrimmed hip and ridge shingles that complement its line of StormMaster shingles. The cap shingles eliminate much of the hand trimming associated with hip and ridge caps, minimizing waste and also providing shadow lines along hips and ridges to match the field shingles — a look that is ordinarily not available when cutting caps from single-ply shingles on a roof with architectural-grade laminated field shingles. Like the rest of the shingles in the StormMaster line, the wind performance comes from the addition of an aggressive sealant strip that keeps the shingles down in high winds, in combination with the SBS-modified asphalt in which the fiberglass mat is sandwiched. The SBS emulsion is a flexible, rubberlike material that is less likely to tear if the tabs are lifted in a windstorm. For more information, contact Atlas Roofing Corporation, 770-952-1442; www.atlasroofing.com.

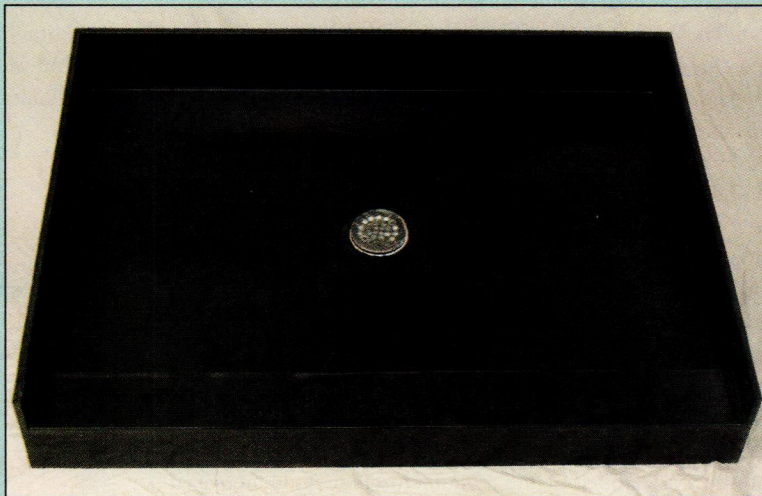


STORMMASTER PRO-CUT HIP & RIDGE SHINGLES

Leakproof Liner

Prefab pan speeds tile prep and provides peace of mind from leaks

Tile Redi shower pan modules replace copper and vinyl shower liners, vastly simplifying the job of installing a tiled shower. The pre-sloped polymer pan, which the manufacture says carries a lifetime warranty against leaks, provides a continuous 1/4-inch slope for drainage without puddles, and integral ribs underneath the pan eliminate the need for building up a mortar bed. Tile Redi units can be used with PVC, ABS, or metal drains. Once in place, tile can be installed directly to the visible part of the liner, including over the preformed curb. For more information, contact Tile Redi, 800-232-6156; www.tileredi.com.

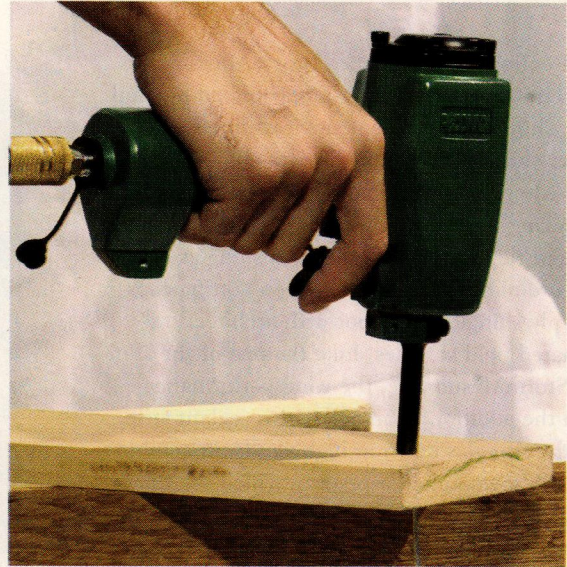


TILE REDI

Denailing Gun

Pneumatic power for demolishing wood-frame construction

The unprecedented amount of demolition and salvage work in Mississippi and Louisiana could get kicked forward by the Nail Kicker. This tool, which retails for about \$250, resembles a pneumatic nailer but works in reverse: the sleeve of the tool is designed to slip over the pointed end of a nail, and a stout driver in the sleeve "kicks" the nail out of the wood. This action requires that the framing already be knocked apart and the old nails exposed, but Hurricane Katrina, followed by bulldozers, has already helped that along. According to the manufacturer, the Nail Kicker packs enough punch to dislodge spikes up to 20d in size. The tool kicks the nail out about 2 inches with each blow, so multiple blows may be needed for long nails. For more information, contact Reconnx, Inc., 888-447-3873; www.nailkicker.com.



NAIL KICKER

The Next Cordless Revolution

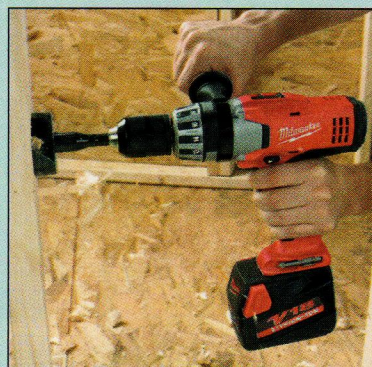
Toolmakers embrace lithium-ion battery technology

Lithium-ion cordless is catching on in the tool market. Milwaukee was the first to offer a line of tools powered with longer-running lithium-ion batteries, followed quickly by Makita and DeWalt, with Hitachi becoming the latest contender. Lithium-ion cells are considerably lighter than nickel-cadmium and nickel-metal hydride cells, a feature which manufacturers have exploited in various ways. Milwaukee and DeWalt used the lighter cells to stuff more in a battery pack to increase voltage. Milwaukee's first tool offering was a 28-volt tool line, while DeWalt served up a 36-volt line. All these tools pack enough power for high-draw applications, such as recip saws with longer strokes, circular saws with greater cutting capacity, and drill/drivers capable of powering a large-diameter hole saw.

Makita, Hitachi, and (once again) Milwaukee have applied the new technology to enhance their 18-volt lines, reducing the overall weight of the tools while increasing run time. Other advantages claimed by the manufacturers include increased battery life: the new batteries can reportedly be charged and

discharged two to three times more often.

For more information on any of the lithium-ion cordless tools, contact DeWalt, 800-433-9258, www.dewalt.com; Hitachi, 800-829-4752, www.hitachipowertools.com; Milwaukee, 800-729-3878, www.milwaukeeetool.com; and Makita, 800-462-5482, www.makita.com.



MILWAUKEE V18



HITACHI HXP

Cedar Look-Alike

Interlocking panels speed installation

Nailite's polypropylene siding panels simulate the look and feel of cedar shingles. **RoughSawn Cedar EZ** panels use an injection molding process that creates a detailed texture that matches cedar. In the weathered **Cape Cod Perfection EZ** and **Perfection Plus Cedar** versions (which tend to be best suited for the coastal vernacular), it's hard to tell the difference from real cedar when standing a few feet back. The panels interlock, making installations easier and faster, says Nailite's director of marketing Angel Toter. The interlocking system automatically spaces each panel to allow for expansion and contraction, which is similar (or only slightly greater) than PVC. For keeping the panels in place, make sure that a minimum of eight nails are installed along the nailing hem of the 36- to 43-inch panels, as per the manufacturer's directions. We believe it's a good idea to use ring-shank nails with these or any vinyl siding, as well. For more information, contact Nailite, 888-300-0070; www.nailite.com.



ROUGHSAWN CEDAR EZ

Modern Metal

Copper, zinc, and stainless steel garage doors

Designer Doors offers metal-clad wood garage doors that provide a contemporary look as well as opening protection in high-wind zones. Available in copper, zinc, and stainless steel, these claddings provide exceptional protection from weathering. Left uncoated, the copper and zinc will oxidize to a deep green or blue patina, respectively, while the stainless steel version maintains its bright, modern finish. The door's strength for resisting wind-borne debris comes from a concealed strut within the wooden panels of the door. Models are available to meet Miami-Dade County requirements — the toughest wind codes in the country. For more information, contact Designer Doors, 800-241-0525; www.designerdoors.com.



DESIGNER DOORS

PVC Trim Kits

New line of finish-grade stock meets the grade for durable exteriors

Advanced TrimWright offers a complete line of cellular PVC exterior trim products. Like other cellular PVC trim materials, TrimWright provides finish-grade stock in a range of sizes that won't shrink, warp, or rot, and is unaffected by moisture or insects. ATW's line includes pre-joined corner boards, crown stock, dentil moldings, column wraps, and door trim kits with fluted side casing and pediment heads. For more information, contact Advanced TrimWright, Inc., 877-822-7745; advancedtrimwright.com.



ADVANCED TRIMWRIGHT

New Cordless Nailer

DeWalt takes on the Impulse

DeWalt recently introduced a cordless nailer that uses an 18-volt nicad battery to power a mechanical flywheel system to drive nails home. The result is the DC628K1 15-gauge nailer that shoots 1 $\frac{1}{4}$ - to 2 $\frac{1}{2}$ -inch finish nails. It's the latest challenger to Paslode's Trimpulse nailer that first debuted about 15 years ago. Since then, only Porter-Cable has previously attempted to put up any competition against the Trimpulse. DeWalt's version comes the closest to being a contender: like the Paslode version, the DeWalt nailer has a streamlined housing with an angled magazine, and it operates like any air nailer, without, of course, being tied

to a hose and compressor. (The Porter-Cable Bammer requires the operator to push the body of the tool in a few inches — an action that takes some getting used to.) DeWalt offers one significant improvement over Paslode's, however: it doesn't require fuel cells, which could amount to a considerable cost savings running the tools. DeWalt claims its nailer can fire approximately 720 2 $\frac{1}{2}$ -inch nails per battery charge and deliver them much



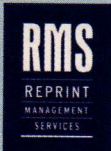
DEWALT DC628K1

faster than either the Paslode or Porter-Cable tools. For more information, contact DeWalt, 800-433-9258; www.dewalt.com.

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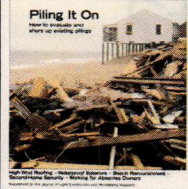
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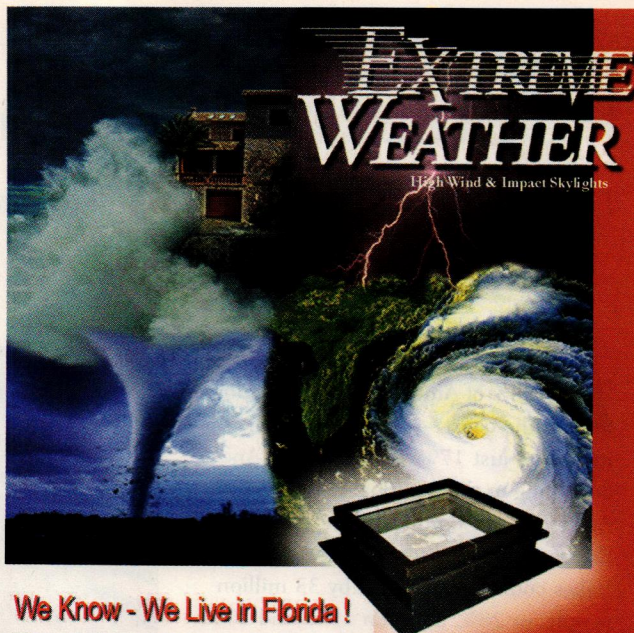
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Population Downshift?

Despite anomalies, coastal counties still dominate in total population

According to U.S. Census figures, 53% of Americans now live along the coast — a land area that makes up just 17% of the country. And, according to the National Oceanic and Atmospheric Administration (NOAA), the population of coastal and Great Lakes counties increased by 33 million people, or 28%, between 1980 and 2003. This population shift has figured prominently in the building boom. Coastal growth accounted for 43% of building permits for single-family homes and 51% of permits for multifamily homes between 1999 and 2003, with Florida and California growing the fastest.

It's figures like these that make another trend so surprising: Two celebrated coastal destinations — the Florida Keys and San Diego — are *losing* residents. Monroe County's population dropped 2.2%, from 78,016 to 76,329, between July 2004 and July 2005. San Diego County's population fell 0.1%, from 2,935,190 to 2,933,462.

A one-year anomaly? Not according to census figures, community leaders, and demographers. Monroe County has lost residents every year for the past five years, with the latest decline causing it to be ranked eighth on the nation's Top 10 list of slowest-growing counties (behind Choctaw, Ala.). Meanwhile, the county's schools lost 10% of their students between October 2004 and October 2005, says Virginia Panico, president of the Key West Chamber of Commerce.

San Diego County's population has changed little since 2003 after several years of breakneck growth, census figures show. That's mirrored throughout coastal California, where growth in recent years has slowed or stalled, reports Hans



NOAA

Cooling off.

Will high home prices and rising insurance costs stall the migration to the coasts?

Johnson, a demographer with the Public Policy Institute of California.

Residents and experts attribute these population losses to one other trait the two communities share: sky-high housing prices.

Pricey digs lose luster. While complaints about housing costs pushing out low-income residents are hardly new, prices appear to have reached the level that they're also motivating well-off residents to stay away or cash out.

David Lane, a retired creative director for an advertising firm, put his Key West three-bedroom, three-bath home with a pool up for sale for \$1.5 million last January. At age 61, he fears the consequences of a major hurricane on an asset that, thanks to its rocketing rise in value, has become a substantial part of his retirement portfolio. It's too significant to risk on a storm, he says.

Keys residents are also facing spiraling hurricane insurance premiums and what might be termed "hurricane weariness." Keys residents had to evacuate six times in the 2005 and 2004 summers alone, while they pay the highest wind-

storm insurance rates in Florida. Lane reports an annual windstorm premium totaling \$12,700, and Panico confirms: "Windstorm insurance is our second worst enemy" after high housing costs.

It's not over till it's over. Do the latest numbers from these two counties signal an end to the migration to the coasts? Stan Smith, director of the Bureau of Economic and Business Research at the University of Florida, doesn't think so. "Momentum has a big impact," he says. "Things that were happening during the last decade are probably happening again this decade."

But there's no question that given enough time, major population patterns do shift, Smith notes. For example, the south-to-north migration that dominated the late 1800s and much of the 1900s has reversed itself in the past few decades, and this may be the beginning of another reversal. According to NOAA, between 1990 and 2003, inland counties grew faster nationally than coastal counties, even though coastal counties still dominate in total population. — Aaron Hoover