

# *Durable* EXTERIOR DETAILS

*With good design and  
the right materials,  
you can build exteriors  
that weather gracefully  
for years*

**A**s a business owner, I try to minimize marketing and warranty costs. The most sensible way to do

by Paul Eldrenkamp

that is to build a finished product that looks as good in ten years as it does right after completion. A good looking job provides free advertising for my company, and the low maintenance of a durable exterior cuts down on call-backs and increases customer satisfaction.

I make it a policy to return to past projects regularly to see how the materials and techniques I use are faring. This practice has sometimes taught me more than I really wanted to know, but at least I've learned which exterior details do and don't work over time.

Good exterior work should weather



# The Right Stuff

**P**aint protects exteriors by providing a renewable sacrificial wear surface. The paint takes the beating, and the underlying material is spared. With regular recoating, wood exteriors can last indefinitely. Compare this with vinyl, for example, which cannot be easily painted. Vinyl siding will start looking old and beat-up in about 20 years, and then the only realistic choice is to replace it. If you want the structures you build to last 50 to 100 years, as I think they should, use paintable materials, and install them in a way that allows the paint to adhere well over time.

**Pine** is commonly used as an exterior finish material, but it requires particular care because it rots very quickly through the end grain. If you have to use pine, make sure there's good draining and drying opportunity around pine end grain, and be sure to hit the ends with a thick coat of primer before installing. In fact, any piece of exterior wood you install should have a coat of primer or sealer applied on all faces and cut ends.

## Wood Substitutes

Synthetic products or manufactured wood products that can take a coat of paint often hold up much better than wood over time.

Celtec 550 (Vycom, 801 Corey St, Moosic, PA 18507; 800/235-8320; [www.cpg-vycom.com](http://www.cpg-vycom.com)), for example, is a rigid PVC material that when painted can only be distinguished from wood by the fact that it doesn't warp, check, rot, or bleed through. It can be used anywhere, including in direct rain and sunlight. Paint wears off rather than peels or flakes off, which is exactly what you want to happen. We use Celtec boards primarily for vertical trim such as corner boards (especially very wide ones) and casings (see photo, left). It also works well for frieze boards.

MDO plywood, which is cheaper than Celtec, works well for soffits and other areas where edges are not exposed. I once used MDO plywood in a particularly grueling application: as a south-facing slide on a toddler playground.

Wood substitutes, such as the Celtec 550 used for pilasters on this Greek Revival renovation, can look as good as wood while also lowering long-term maintenance needs.



Even under these extreme conditions, all it has needed for maintenance is a coat of paint every two years. MDF also works in exterior applications so long as all faces and cut edges are sealed prior to installation.

But remember, joints need to be flashed — don't rely on caulk alone. I would not use either MDO or MDF in areas where they would be frequently hit with direct rain and sun unless I was willing to be particularly vigilant about maintaining a thick enough protective paint layer. For example, I often see people applying wood moldings to MDO panels to create a frame-and-panel effect, especially on storefronts. This detail doesn't wear well over time because water gets into the joint between the molding and the panel and stays there. Trapped moisture then penetrates the panel at nail holes and along the edges, leading to chronic paint failure and eventual rot.

Although I have not used fiber-cement products myself, everyone I've talked to who has finds them extremely durable as an exterior cladding material. Fiber-cement should need painting less frequently than wood siding because it expands and contracts very little with temperature changes. But because fiber-cement is porous, either buy it pre-primed or prime it on all sides yourself before installation.

## Windows and Doors

Ordering wood windows pre-primed at the factory will pay for itself by protecting the wood and saving job site prep time. When trimming out wood windows, the sill is most vulnerable to water damage, especially if it has finger joints.

**Avoid wood storm doors**, or carefully select which ones you use. I came to this conclusion with regret because I grew up in Iowa, accustomed to the slam of a spring-loaded wood screen door. But every time we've installed pine combination storm doors, we've had to come back repeatedly to adjust them. The pine expands and contracts excessively with seasonal moisture swings and is also prone to twisting and warping, especially when exposed to direct sunlight. Double doors are even worse because they tend to rattle loosely during the dry half of the year, then stick tight during the moist seasons.

A quality wood-core clad storm door, from manufacturers like Larson and Emco, will perform much better because the cladding greatly improves the stability of the underlying wood. I know this flies in the face of my earlier point about trying to use paintable materials. But with clad storm doors (or clad windows), if the amount of non-paintable cladding material is minimal, then I can live with it. If a storm door has to be wood, go all out and get a good exterior wood like cedar or a hardwood.

— P.E.



**Figure 1.** Miter joints stay tight only when temperature and humidity match the day they were installed. When the weather changes, miters tend to open up and allow water to get in and cause rot.



gracefully and require a minimum of maintenance. Paint should gradually wear off rather than peel off, and discoloration from wear and grime should be even and unremarkable. Wood should never rot — where there is rot, there is poor craftsmanship or poor design. A durable exterior will need rejuvenation only every ten years or so, and even then the work should be limited to simple, inexpensive preventive maintenance.

### Flashing and Caulk

One key to long-lasting exterior finish details is proper flashing. Generally speaking, any piece of wood that sets more level than 45 degrees should be flashed. Along skirt boards and cornice returns, I like to use lead flashing rather than water table or aluminum flashing because it performs well and ends up looking better in the long run. Cornice returns need flashing that continuously covers their entire tops and runs up and under the siding. And, although stock flashing profiles are good for many applications, I always have a metal brake on my job sites so that we can bend custom flashing when we need to.

One of the most common flashing

failures I see is at the top of wall openings. When windows and doors are trimmed out, make sure that metal flashing caps off the trim to divert water that hits the siding. Behind the siding, make sure that the building paper overlaps this flashing. One related problem I sometimes see is siding that has been installed tightly against the window trim flashing or the skirt flashing. In these cases, the trim bends the flashing inwards so that it forms a trough where water either gets trapped or drains out towards the vulnerable joints at the end of the flashing. To prevent problems, hold the siding up and away from the corner of the flashing. For even better results, bend flashing to 95 or 100 degrees to ensure that water flows off the front edge.

**Minimize caulking.** If a joint doesn't look good without caulk, it will probably end up looking worse with caulk. Apart from being just about impossible to install well enough to act as a long-term water barrier, caulk can trap as much water in as it keeps out.

While most of us know how caulk is supposed to be applied, few of us actually take the time and effort to do the job right. The result is an awful lot of

wishful thinking, wasted effort, and hideous joints. It is far better to detail your work in such a way that it doesn't need caulk. The most obvious way to minimize caulking is to install even joints between pieces so they look good with no caulking at all.

Although I'm tempted to dismiss most uses of caulk as a band-aid approach to construction detailing, it's inevitably used. You'll do well, though, if you can limit caulk to uses where it acts as a behind-the-scenes sealant. Caulk works best when carefully applied to narrow joints between parallel surfaces that have been prepped with backer rod. It does not work at all when applied on top of an inside corner joint — which, of course, is how 90% of all caulk is applied.

### Keep Joints Simple

My rule of thumb is to avoid fancy joints when installing exterior trim. Although I do advocate using scarf joints for corner boards and rakes, I steer clear of laps and rabbets. While these more intricate joints can increase strength and alignment in cabinetry, in exterior work they decrease durability by increasing the surface area and complexity of a joint. Joint strength

**Figure 2.** Avoid miter joints on porch and deck stair trim. Instead, run stair risers long and butt the skirt board into the risers.



and alignment are not problems with exterior details. Instead, the main objective is to avoid nooks and crannies where moisture can sit and collect.

**Miters** should be avoided because they fit tightly only at the humidity and temperature conditions at which they were first installed. In my New England climate, this is perhaps 25% of the time. The rest of the time, the joint is slightly open and the endgrain soaks up moisture like a sponge (see Figure 1, previous page). Premature paint failure and rot result. Try using butt joints that don't really butt — square ends with a  $\frac{1}{8}$ -inch space between them. Spacing butt joints prevents water from getting trapped and will allow joints to dry out faster. Believe me, it requires as much skill and time to do a porch and stair with rigidly consistent  $\frac{1}{8}$ -inch reveals between finish pieces as it does to do it with tight miters, so this should not be viewed as cheating. Furthermore, the  $\frac{1}{8}$ -inch reveals will look good long after the “tight” miters are rotting and peeling.

There are also other trim-out tricks that avoid miter joints. For example, unlike interior stairs, which almost always have mitered joints between risers and an outer skirt board, the risers on a porch stairway can run long past the skirt (Figure 2).

**On corner boards** and other wide trim, it's important to craft vertical and horizontal intersections in ways that prevent moisture from penetrating and getting trapped behind the exterior surfaces. I've found that stopping a vertical corner board on top of a properly flashed skirt board makes for a more durable detail than the other way around. With this detail, it's important to keep a  $\frac{1}{8}$ -inch space between the bottom of the corner board and the skirt flashing. A shallow back-cut will also help prevent wicking of moisture. The problem with corner boards that run down past the skirt is that water ends up getting into the butt end of the skirt. From there,



**Figure 3.** The deep eaves on this remodel give extra protection to walls and windows beneath.



moisture soaks the sheathing and creeps upwards.

**Eaves and gutters.** Always try for deeper eaves and rakes — 8 inches at a minimum — to help prevent water from sheeting down exterior siding (Figure 3). Drip edge should also be spaced about 1/4 inch off the fascia to keep water from running down the fascia and discoloring it (Figure 4). Adding a second molding along the top of the fascia can help position drip edge even further outwards. Although it goes against what some people want to see, an even more durable design detail is to cut rafters square instead of plumb to lower the chance of roof runoff draining onto fascia boards.

Finally, install gutters so that there's no way for water to run between a gutter and the fascia. Use flashing rather than caulk to bridge this gap (Figure 5).

Clogged gutters don't work and inevitably lead to water damage. In my experience there are two ways to handle this problem: Chop down all trees within 100 feet of the house, or clean the gutters regularly (four times a year or more). Stress to homeowners that they need to clean their gutters more frequently than they probably do now. It's a relatively cheap way to protect their investment.

## Decks and Porches

Exterior living spaces must be detailed differently from interiors because everything must shed water and dry easily. If you install a pine baluster so that the bottom end butts tight to the bottom rail and the assembly is exposed to weather, I can almost guarantee that within five years you will be able to put your thumb clear through the bottom 2 inches of the baluster. A few subtle design changes can keep baluster bottoms relatively dry, such as running balusters through the decking or setting them onto a chamfered bottom rail (Figure 6). If you can't detail the railing to avoid a horizontal butt joint, soak the ends of the balusters in preservative or coat them heavily with primer before assembly.



**Figure 4.** If drip edge is installed too close to the fascia, rain runoff will drain over the boards and lead to discoloration. The author recommends spacing drip edge slightly off of exterior trim to direct water outwards.



**Figure 5.** Properly flashed gutters keep water out from between the gutter and fascia boards. Gutters should also be cleaned frequently to prevent clogging and overflow.



**Figure 6.** The bottoms of wooden porch and deck balusters are particularly prone to rot when they rest directly on a flat bottom rail. Besides always end dipping balusters, alternative designs can help — such as running balusters through the decking (left) or using a chamfered bottom rail that drains water (right).

**Figure 7.** Prevent water penetration where rails join newels by adequately priming the end cut of a rail. It also helps to avoid rails that are wider than 5½ inches. When newels posts are wrapped, butt the rails directly against the trim instead of running rails through to the post where water will get trapped.




You also have to be careful where sloping top and bottom rails hit a newel post. Although there is no way to entirely prevent moisture from collecting at this junction, there are ways to minimize the problem. First, avoid rails that are wide and flat on the top side. Secondly, if you're wrapping a post with trim boards, avoid running the rails through to the structural newel underneath, because water will also run through and become trapped in the void between the wrapping and the newel (Figure 7). Also make sure to adequately prime and coat the end of the rail to prevent excessive wicking of moisture.

Wide and flat or minimally pitched surfaces — like wide railings, wall caps, or newel caps — also present problems. My rule of thumb is to use metal flashing whenever the wood is wider than 5½ inches. For example, I run a piece of flashing completely over column caps (Figure 8).

**Decking.** The recent spate of nail-free wood deck fastening systems has developed in response to the fact that nails don't work so well over time. Big fat-headed nails create water-collecting depressions if you set them too deep; or they rip the skin off bare feet if you don't set them deep enough and the wood shrinks around the nail. Alternatively, you can use a lot of finish nails, but they won't hold over time, yielding a creaky deck.

The deck fastener we like best is the Eb-Ty (Eb-Ty, P.O. Box 414, Califon, NJ 07830; 888/438-3289; [www.ebty.com](http://www.ebty.com)), which is installed using a biscuit joiner. You'll have to be careful estimating a job using these fasteners because they take three to four times longer to install than conventional fasteners. And, the Eb-Ty only works well with stable decking lumber. Don't try them with shrinkage-prone pressure treated wood because shrunken wood can actually slip off the plastic biscuits. But for clients who are willing to pay the premium, nail-free decks are worth the extra hassle. A well-done deck or porch with no surface nails is about the

smoothest and most glorious sight you'll encounter on a project (Figure 9). Waltz on it in your bare feet without fear (or even in nylons, for those carpenters out there who wear nylons).

**Clear preservatives just don't work** to control color even though they might work to preserve the wood. Clients often see a gleaming new wood deck and say "I want it to keep looking just like that." So we obligingly put down a clear preservative. And the deck looks "just like that" for a few months, then starts becoming a mottled gray-black that's not all that attractive. The only way to control the color of decks over time is with a pigmented preservative. I prefer to use a semi-transparent stain and recoat every one or two years. 

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**Figure 8.** Flat surfaces are especially susceptible to water damage and require taking special precautions. On this porch, the column cap is completely capped with metal flashing, and the decorative trim above is also extensively flashed.



**Figure 9.** Nail-free decking systems can dress up a job and reduce points of water penetration. Notice how the author's crew flashes off the newel tops before installing caps.