BUILDER TIME BOMBS

These oversights, omissions, and bad design details can lead to early failures

by Martin Holladay

After working as a builder for almost 20 years, I changed gears and set up shop as a home inspector. Most of the houses I inspected were only five to ten years old. I was surprised to learn how quickly some building components can deteriorate. In house after house, I found it frustrating to see certain poor building details, all leading to similar types of early failures.

In most cases, these details were built wrong not so much because of an intentional trade-off between cost and longevity, but because the builder didn't realize how quickly building components can deteriorate. If the deterioration happens after the normal new-home warranty expires, a builder may never have the chance to discover that some details almost always fail prematurely. Let's face it, we have all thought, as we contemplated a shortcut on the job site, "I know the recommended way to do it — but does it really matter?" I offer these descriptions of failures as a reminder of the importance of building it right the first time.

A building without roof overhangs leaves the siding exposed to the weather

The clapboard siding on this building has no roof protection. It is curling and splitting, and requires repainting every three years.

Stingy roof overhangs, whether at the rakes or the eaves, greatly reduce the longevity of most types of siding. When siding receives the full brunt of the weather, it is alternately soaked by rain and baked by the sun. These humidity changes cause nails to loosen, paint to peel, and siding to rot prematurely.

In many cases, a difference of just a few inches in the width of a roof can make a big difference in protecting the siding.

Smooth-shank siding nails that miss the studs don't hold

Locate clapboard siding joints over studs so that the nails penetrate the framing.

Smooth-shank siding nails that penetrate the sheathing, but not the framing, cannot hold clapboards for long. After just a few years, normal variations in humidity cause the siding to swell and shrink, ratcheting out the smooth-shank nails. Inadequately nailed clapboard siding soon begins to curl.

The solution is to use ring-shank siding nails, nailed into the studs. Most siding manufacturers recommend that ring-shank nails penetrate 1¼ inches into the nailing base, and that smooth-shank nails penetrate 1½ inches. If you are installing ½-inch bevel siding, that means using 5d ring-shank nails or 6d smooth-shank nails. But if you aren't going to bother to locate the studs, it hardly matters how long your nails are: Since they'll only be hitting the sheathing, they'll only hold as well as 2d nails.

Exposed exterior doors deteriorate quickly

When an exterior door has no roof protection, the lower sections of the jambs and door are vulnerable to rot or rust.

Exterior doors should be protected from rain by a roof that extends at least 3 feet beyond the door. A roof located high above the door —— for instance, the rakes on the gable end of a two-story house — offers little, if any, protection against wind-driven rain.

Unroofed exterior doors can begin to deteriorate just five years after installation. They are vulnerable to direct wetting as well as splashback. Usually, the first signs of deterioration are jamb rot and rust spots near the bottom of the door.

Steel door proponents sometimes say that "unlike wood, steel doesn't rot." Steel doors can rust right through, however, and it happens particularly quickly when the builder fails to paint them. The factory-installed primer on a steel door is not intended to be a finish coat of paint.

Wood siding installed too close to the roofing rots quickly

When an exterior wall with wood siding rises above a roof — for example, where a two-story house extends above the roof of an attached one-story garage — the siding and corner trim nearest the roofing can rot quickly. Rain bounces off the roofing onto the adjacent wall. Snow may sit on the roof for months at a stretch.

Instead of butting wood siding and trim up to the roofing, it should be held back to prevent the wood from wicking up water, and to allow for drying.

In the case of asphalt shingle roofs, siding is usually installed over step flashing formed from 8-inch aluminum squares. This gives 4 inches of flashing on either side of the crease. Some siding installers pride themselves on covering as much of the flashing as possible, bringing the end grain of the clapboard close to the roofing. On the contrary, the more exposed metal, the better.

Ideally, step flashing should be at least 12 inches wide, with 8 inches on the vertical side of the crease, and 4 inches on the roof slope side. That way, the siding and corner trim can lap the flashing by 4 inches, and still leave a gap of 4 inches between the siding and the roofing.

High-grade causes splashback

If the grade is too high, the water table and corner trim are kept constantly wet from splashback and damp grass.

Some design and workmanship problems are easier to fix than others. One of the most frustrating errors to encounter, years after construction, is a high grade. Ideally, the final grade should be at least 8 inches lower than the lowest wooden components of a building —usually, the water table or lowest course of siding. Unfortunately, far too often a builder establishes the final grade within an inch or two of the lowest course of siding.

By the time the wooden components nearest grade are beginning to rot — due to splashback or damp vegetation — landscape plantings are usually well established, and concrete walkways may have been poured. At this point, lowering the grade is very expensive. Worse yet, the builder didn't save any money by doing it wrong in the first place. Usually, establishing a lower grade at the time the foundation is backfilled won't cost the builder an extra penny; in fact, if it saves bringing in some fill, it might even be cheaper.

Proud fasteners poke through asphalt shingles

The main challenge when installing asphalt shingles with an air tool —– whether a nail gun or a stapler — is accurate depth adjustment of the fasteners. If staples are left proud, the roofing will fail prematurely as the staples poke through the overlapping shingles.

The Asphalt Roofing Manufacturers Association recommends that only nails, not staples, be used to fasten asphalt shingles, although some manufacturers, including GAF, permit stapling. Regardless, fasteners must not be left proud.

Protruding fasteners can cause breaks in asphalt shingles.

"Picture frame" window trim catches water

Because it catches water from the window sill above, the pine trim on this house began rotting after only five years.

These days, many windows come from the manufacturer with nailing flanges and no casing. You can get into trouble if you try to dress up such windows with exterior casing.

How far the manufacturer's window sill will project from the plane of the sheathing depends on the type of window, the type of sheathing used, and how the window is installed. In some cases, the sill will not project enough to permit the installation of a 3/4-inch-thick exterior apron or trim piece under the sill.

A window should never have exterior casing installed like interior "picture-frame" trim. If the trim ends up proud of the sill lip, as was the case at one five-year-old house (photo), it acts as a sponge to receive all of the water dripping off the window sill.

Poorly supported horizontal plumbing vents become blocked

Most plumbing codes require horizontal lengths of plastic pipe, including vent pipe, to be supported every 4 feet. It is especially important to install a pipe hanger near the point where the vent turns to penetrate the roof.

Plastic plumbing vents run horizontally in an attic should be supported every 4 feet, but this doesn't always happen. Perhaps the installer figures that since the vent pipe doesn't have to carry water, some of the hangers can be omitted.

In the house where this photo was taken, the poorly supported PVC vent pipe was stressed by the added weight of the cast-iron transition through the roof. The sagging pipe formed a trap, and the vent became blocked by standing water. The source of the water was either rain entering the top of the vent, or condensation forming inside the cold pipe in the attic.

As a result, whenever the washing machine drained, the descending column of draining water created negative pressure, sucking the water out of the P-trap under the lavatory sink. The owners complained of sewer gas smells coming from the lavatory.

Miters in post-formed countertops that are too close to the sink cause the substrate to swell

Over time, water will enter a mitered joint on a laminate countertop, causing the particleboard substrate to swell.

There are two basic types of laminate countertops: post-formed and custom self-edged. A custom top can be formed in an L-shape in one piece, avoiding miter joints. However, with post-formed laminate, the inside corners are usually joined with a site-glued miter joint.

In theory, mitered joints in post-formed laminate countertops can work — if they are kept dry. (As we all know, kitchen countertops never get wet.) If these miter joints do get wet, the particleboard substrate begins to swell. If you prefer to use post-formed laminate for kitchen countertops, at least plan the kitchen to keep the miter joint as far from the sink as possible. If the sink is within 4 feet of the miter joint, you had better hope the homeowners don't use their sink very much.

Patio slabs poured on uncompacted soil will settle

All too often, concrete slabs and stoops installed against a foundation heave or settle, occasionally because of frost action, but more commonly because the backfill compresses. Since the fluffiest, least compacted soil is typically closest to the foundation, slabs and stoops often lean toward a building as time passes. Rainwater hitting the concrete is then directed toward the building, raising the chance of basement flooding and rotting siding.

There are various solutions to this problem, including extending a footing below frost level, or installing a deep layer of crushed stone under the concrete. At a minimum, backfilled soil should be thoroughly tamped with a mechanical plate compactor.

This wooden step (above) was built to compensate for a concrete stoop that settled. The photo at right shows how a settling patio slab directs rainwater toward the house.

Bath exhaust fans ducted to the attic cause mildew, rot, ice dams

The bath exhaust fan should always be ducted to the exterior, never terminated in the attic. To be charitable, this is one of those items that is not so much a deliberate error as a forgotten detail. “Sure, I was going to get back up in the attic, as soon as the siding was done, to take care of that bath exhaust duct …”

What’s wrong with blowing the bath exhaust (or the range hood, or the dryer vent) into the attic? After all, the attic has soffit and ridge vents, so it shouldn’t be a problem, right? Actually, there are two problems with this idea: warm temperatures and high humidity. The warm interior air from the exhaust duct raises the temperature of the roof sheathing, melting the snow and leading to ice dams. And since the interior air (especially bathroom air) is very humid, that moisture will want to condense on the cold surfaces in the attic.

In houses with a bath exhaust fan vented to the attic, the underside of the roof sheathing is often black with mildew. The soffit and ridge vents do not provide enough ventilation to handle the added warmth and moisture from an exhaust duct.

Whenever a bath exhaust duct terminates in the attic, the warm, humid exhaust air can cause mildew and ice dams.

And you thought plumbers were bad ...

I’m almost done, Joe. Just hand me the Sawzall.

Maybe next time your heating sub comes in and installs a metal chimney, you should climb into the attic to look at his work.

Would a chimney installer really cut a rafter without installing a header? During my work as a home inspector, I saw this problem three times in three years.

*Assistant Editor **Martin Holladay** was a builder and home inspector for 22 years.*