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Countdown to Quality

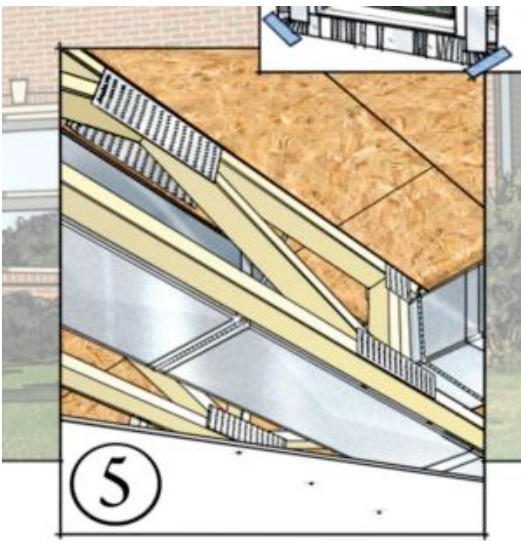
How to avoid the five most common errors builders make when it comes to energy, health, and resource efficiency.

By: [Mark LaLiberte](#)



I'll be the first to admit that the basic building science details of a solidly built home aren't quite as sexy as green features like bamboo floors and solar PV panels. Even so, we need to get away from the idea that a green home is just about the products. While new green products are great, they're only "lipstick on a pig" if the home isn't also energy efficient, built to last, healthy, safe, and affordable to maintain.

Unfortunately, in my work with companies across the country, I see far too many "green" builders missing the mark. So, with a nod to David Letterman and his lists, I bring you my first "Top Five Mistakes" ranking in the hope of helping you avoid them and remind you to make these fundamentals the core of your green building efforts.



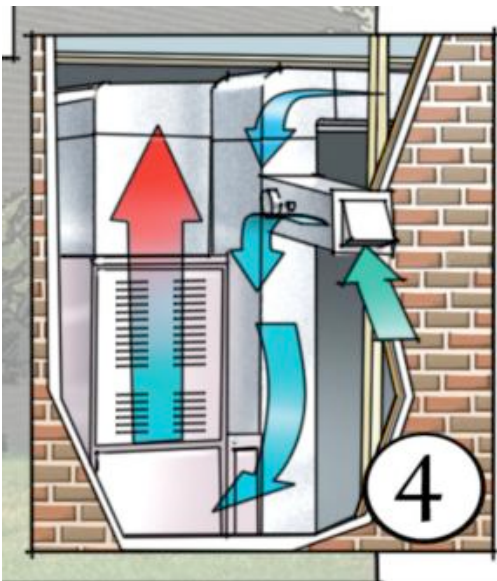
Layout and install all HVAC ductwork to run inside conditioned space to reduce heat loss and improve efficiency.

No. 5: HVAC Ducts Installed in Unconditioned Space

Where is the hottest place in your house on an 85-degree summer day? Where is the coldest place in your house on a frigid January night? In both cases, it's the attic. So, if you were deciding where to locate a forced-air heating and cooling system, what's just about the worst place you could put it? It's obvious: Don't put your HVAC system in an unconditioned attic.

What's a better location? Put the ducts between the floors or in dropped soffits inside conditioned areas of the house. That way the conditioned air always travels through ducts at room temperature. Some builders are conditioning the attic by placing insulation near the roof deck rather than at the ceiling. This brings attic temperatures much closer to those inside the house, but it does add an additional energy load to the home. It's a step in the right direction, which is getting HVAC systems located inside the living space of the home.

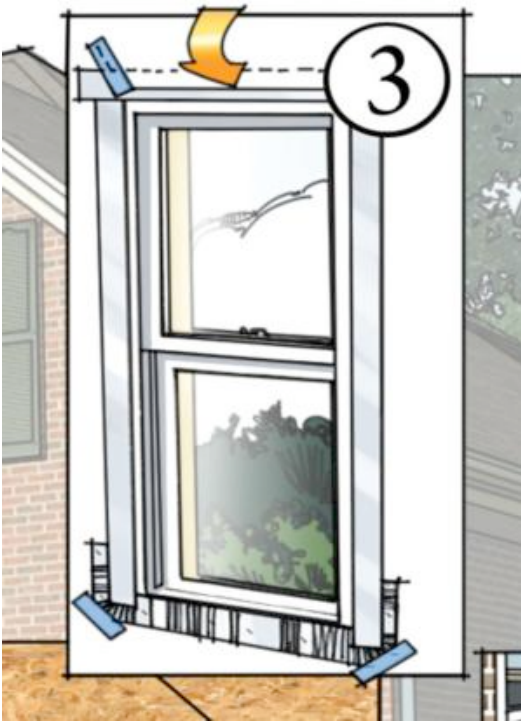
No. 4: Tight Homes Built Without Intentional Ventilation



Install whole-house ventilation systems as standard equipment to provide fresh air in tight homes.

I don't know about you, but when I'm in my house, I like having fresh, filtered air delivered to my living space at a rate that's similar to my respiration. In the old days, this wasn't a problem; normal air leakage around windows and doors, through sills, and out the chimney always ensured there was plenty of fresh air coming in. But with home construction getting tighter, we have significantly reduced the paths of air leakage. The air that does make it in comes in accidentally, driven by wind, temperature, pressure changes, and perforations in the building envelope. In many cases, this incoming air passes through a garage, crawl space, or attic on its way into the home. Airborne pollutants and dust tag along.

The simple solution is to always design for fresh air. Install a whole-house ventilation system and test its performance. This ventilation and distribution system should ensure that the house brings in and disperses approximately 50 CFM of fresh air for 15 to 20 minutes each hour or so. (See my Spring 2008 column for an explanation on sizing a ventilation system.) Every home built today should include a ventilation system to ensure that the people inside breathe clean, healthy air.



Update your installation techniques for flashing and drainage planes to control water and manage moisture.

No. 3: Improper Flashing and Drainage Planes for Water Management

Sometimes it seems like builders have forgotten some old-fashioned techniques when it comes to water and moisture management and, too often, I see them make the same mistakes when it comes to flashing and drainage planes. Today's construction is more complicated than before. New materials and techniques make new homes less forgiving, and if they're subjected to extended wetting cycles and are unable to dry, they are likely to fail.

This means we need to pay very careful attention to how windows are flashed, how penetrations are sealed, and whether water coming off the roof is winding up in the basement or crawl space. There is little room for flexibility here. To avoid problems, you need to pan-flash all windows and doors in every climate. You need to flash all penetrations at the sheathing interface, integrating them with a weather-resistive barrier. You must make sure kick flashing, gutters, and complex connections between walls and roofs, deck ledgers, and other challenging design features are flashed and drained with the technology of old: slopes, shingling, and intentional paths for water.

Take the extra time to get it right. Work with your framers, roofers, siding contractors, plumbers, electricians, and other trades to define how the building will be flashed and the water will be managed, who will do the work, and what techniques they will use. Use a high-quality, nonperforated housewrap. Choose compatible tapes and sealants. Select subs who understand the issues and whom you can trust to ensure that all these pieces and parts work together.

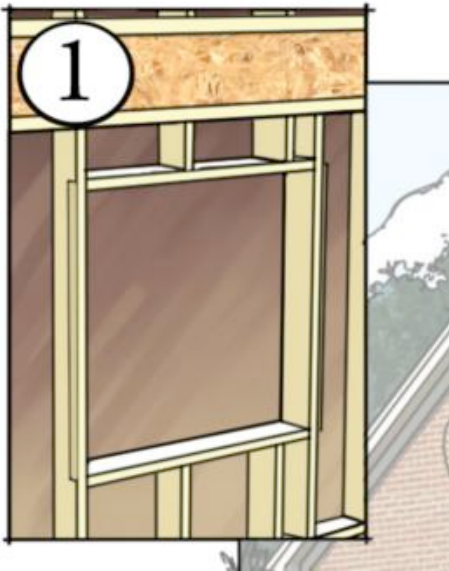
No. 2: Poorly Selected and Installed Insulation



Spec blown-in or sprayed-in insulation products to improve energy and air-leakage performance.

Home insulation has come a long way in the past 100 years. Instead of filling wall cavities with crumpled newspapers or straw, we now have blown-in fiberglass and cellulose, open- and closed-cell spray foams, and factory-built wall systems that seamlessly integrate insulation with the structure itself. But here again, it's about more than the materials. Considering the haphazard way that homes are often insulated, you might as well be using yesterday's newspaper.

We get only one shot at properly insulating and air-sealing our homes, so it's no place to scrimp. I am not a fan of batt insulation. With the complexity of today's framing systems and the variability of installers, it is extremely difficult to get it right. If you are using traditional framing, use any type of blown-in insulation so it fits and fills the wall as tightly and completely as possible. Remember to air-seal all penetrations to the attic, to the garage, and to the outdoors using blocking, foams, and sealants. Look closely at the options, and don't write off seemingly small but critical details. Added together, they will reduce the overall size of the heating and cooling system, reduce callbacks, and improve customer satisfaction. In most areas, a properly insulated home will qualify for energy certification programs and even tax credits. Energy efficiency is the cornerstone of sustainability.



Reduce framing material requirements by adopting new, more efficient details.

No. 1: Wasted Resources

If I have learned one thing in this tightening economy, it's that I don't need as much stuff as I thought I did. I don't need to make as many trips to the store, and I don't need to leave the lights on when I go out. As we become more and more aware of our growing impact on this great planet, we are realizing that it's time to stop and reconsider every action.

Our industry uses so much stuff to create places to live. We can and should be more efficient with what and how we use these resources. Start with a look at what your crew is throwing into the Dumpster. A lot of the lumber scraps you're paying to dispose could be used for blocking, cripples, header blocks, and draft stopping. It's a waste of materials and a waste of money to have it hauled away.

We can be more green, more profitable, and more effective by using less. Use advanced framing techniques that require less lumber, increase insulation levels, and lower energy costs. We can design our buildings to better use 4x8 sheet stock by recalculating roof pitches, window placement, and room sizes. If carpet comes in standard-width rolls, designing a room that size means fewer cutoffs and less site waste.

This is easier than it sounds. Take a few extra minutes with your designer, suppliers, and trades to calculate and specify what you really need. If it's easier to just send more, they often do, and these excess materials get discarded or are poorly used.

Imagine the cumulative impact this could have on an entire housing development: fewer materials consumed, less energy consumed. It's about the energy, folks. We must use less.

President of LaLiberteOnline and a principal of Building Knowledge Inc., Mark LaLiberte is a highly regarded green building consultant who helps builders nationwide understand and apply proper building science construction principles to improve their homes. www.buildingknowledge.com; www.laliberteonline.com.

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