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sustainable resources

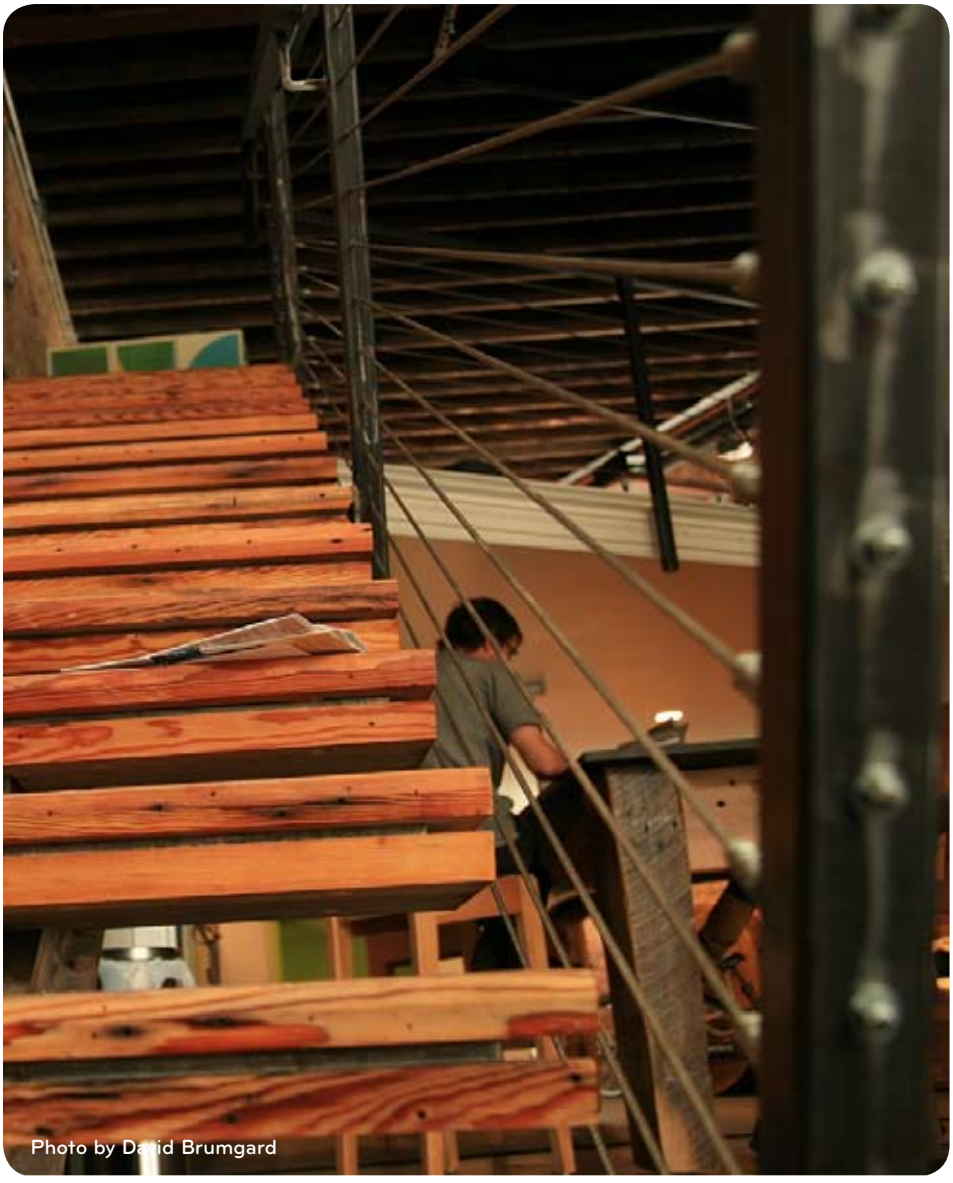

Photo by David Brumgard

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sustainable resources

A Whole Systems Approach means re-thinking the construction process from material selection to finish carpentry. Unfortunately, product labels are no help for choosing green products and materials. So before we think about purchasing products and materials for their greenness, we ask some questions. Here are 5 easy questions to ask when choosing green products and materials.

Where and how is it manufactured?

It's not green if the methods for producing and distributing it have a negative effect on our environment. A manufacturing process that results in little or no material waste is always preferable. Some products are made using less energy and fewer mined materials. And if possible, buy local. Choosing locally manufactured and sourced products helps reduce CO_2 emissions because less energy is needed for transportation.

Photo by Christian Rushing, designer and developer

Is it rapidly renewable?

Choose resources that regenerate themselves rapidly and without our help. And without us meddling with local eco-systems. Cork, bamboo, and wool are common examples of rapidly renewable resources. In each case, the harvest rotation is 10 years or less—meaning that supply trumps demand. Though some resources travel quite a distance to get here, those miles are worth protecting natural habitats, reducing the over-production of new materials, and preventing landfill waste.

What is its life-span?

Some green products are neither locally manufactured nor rapidly renewable. Like Siberian Larch or Zappone Aluminum. Well, these products are still considered green by industry professionals and green rating systems. Why? Because a product's longevity contributes to solving numerous environmental problems. Extremely long lasting materials help reduce landfill waste and decrease the unnecessary production of new materials. And in many cases, these products are made with recycled content and are 100% recyclable as well.

Is it recycled? Recyclable?

Recycling feels good—whether it's a glass bottle or an entire house, knowing that we've been able to redirect a material's seemingly inevitable path to eternal landfill stagnation…well, it just feels good. And choosing green products can feel good too. Roofing, siding and decking materials are among the most commonly recycled/recyclable products available. Fiber cement siding is often comprised of fly ash, a byproduct of electric generating facilities; aluminum and copper siding/roofing are often made with recycled content and are recyclable as well; and composite decking also contains recycled content.

Is it breathable?

If it smells like it's killing brain cells, and if it feels like it's killing brain cells, then you should probably err on the green side. VOCs or Volatile Organic Compounds are commonly found in paints, caulks, and adhesives. The problem is that these compounds emit unhealthy gasses into the air, and concentrations of many VOCs are up to ten times higher indoors than outdoors. The best way to find out how to avoid VOCs is checking out the EPA's website.

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advanced framing

Photo by Christian Rushing, designer and developer

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advanced framing

A Whole Systems Approach means using eco-smart building techniques that you can't always see. Like, behind a wall where framing and insulation collaborate to stop energy loss. Advanced framing techniques decrease the total square footage of lumber in a wall by 54%. In place of lumber, insulation is used to nearly double a wall's thermal capacity.

Image courtesy of Eric Myers, Elemi Architects

Optimum Value Engineering

Using less lumber helps reduce deforestation while helping homeowners save energy. And builders save time and money. Instead of framing with 2x4 studs at 16" on center, we frame with 2x6 studs at 24" on center, eliminate headers in non-load bearing walls, insulate necessary headers, use single-top plates and 2-stud corners. In other words, we frame houses using an optimum amount of lumber.

Thermal Bridging

Reducing lumber also helps reduce energy loss. Lumber does not have a great resistance to energy transfer. And because energy always moves from hot to cold, lumber acts as a thermal bridge that allows heat to travel through walls. So by reducing lumber in a wall, we reduce thermal bridging. And because we frame with 2x6 studs, the lumber we use has a greater resistance to energy transfer.

R-Value

By using less lumber, we are able to use more insulation, which allows us to increase a home's R-value. R-value is important because it is the measure of a material's resistance to energy loss. And the higher a material's R-value, the greater its thermal capacity. Using advanced framing, we are able to nearly double the R-value of a wall from R-11 to R-21.

2x4 conventional framing

> One wall 10' x 10' has 100 Sq Ft
> 23% of wall is made up of framing material with an R-3.5
> 77% of wall has R-13 insulation
> The total R Value of the wall is R-11

2x6 advanced framing

> One wall 10' x 10' has 100 Sq Ft
> 12% of wall is made up of framing material with an R-5.5
> 87% of wall has R-19 insulation
> 100% of wall has R-4 sheathing
> The total R Value of the wall is R-21

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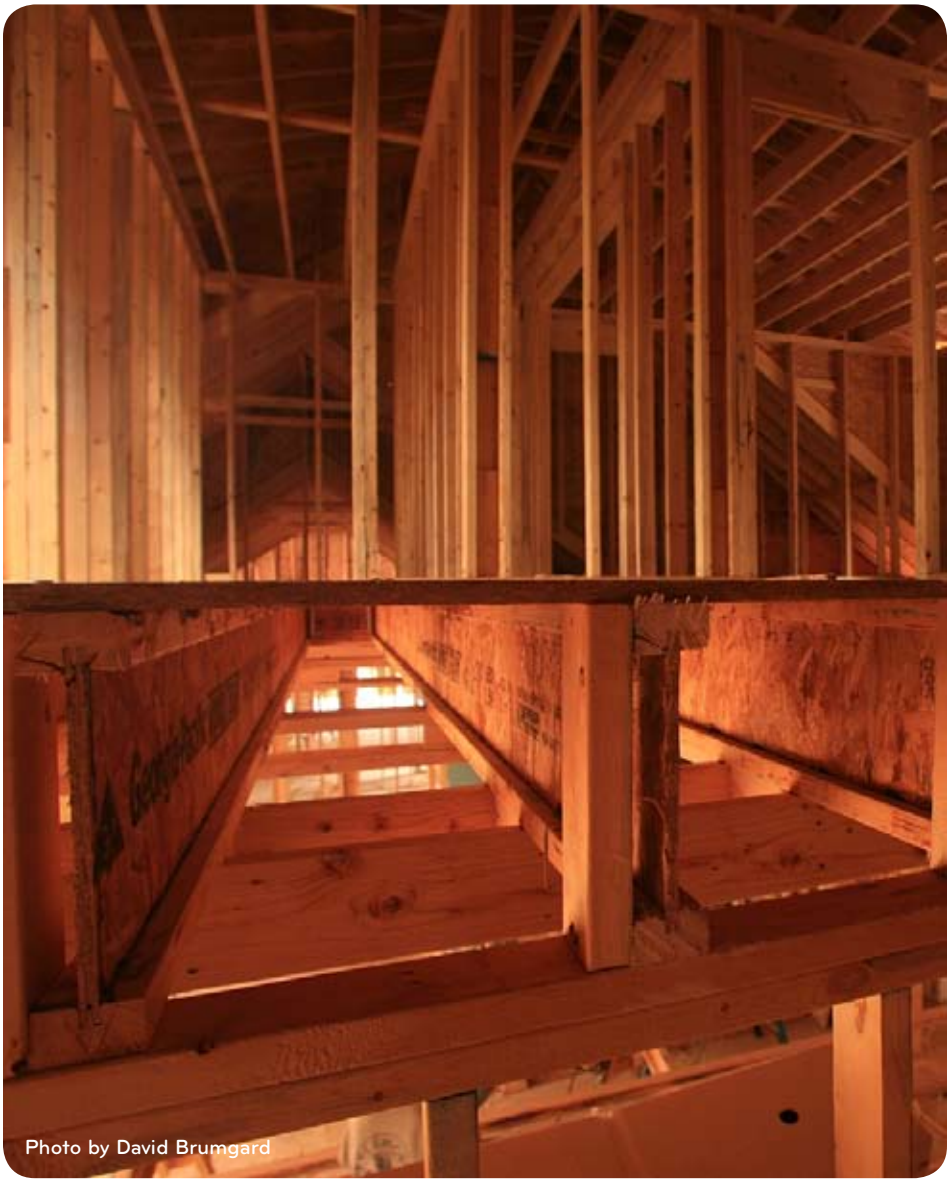
insulated space



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insulated space

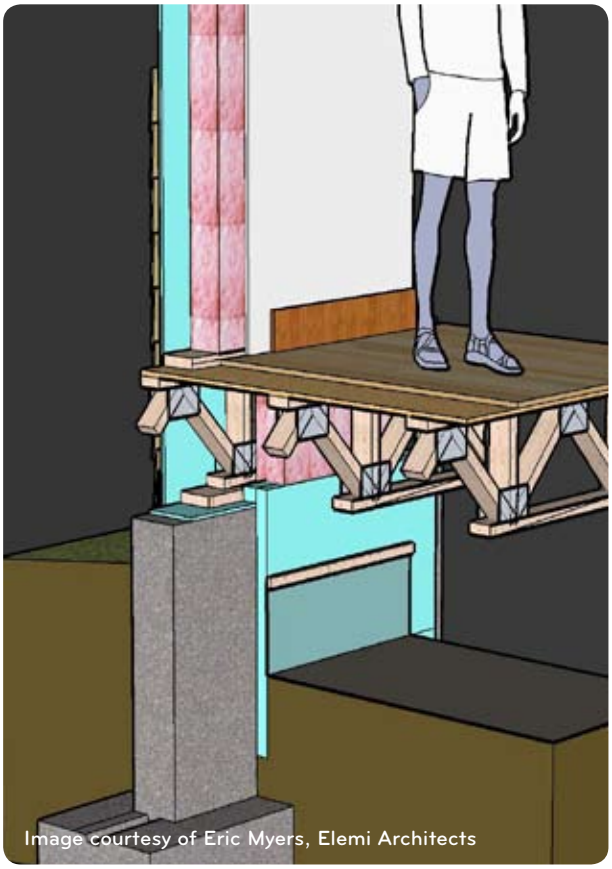
A Whole Systems Approach means controlling the temperature in every part of a home, including the crawl space and attic. Keeping temperature the same throughout the whole home helps eliminate the risk for mold, mildew, rot and termite damage. So we insulate, seal and condition. These are the three most effective strategies for reducing a home's energy consumption and ensuring its longevity.

The insulated crawl space:

In a mixed humid climate, the last thing we want to do is allow warm wet air to enter from underneath our house where that space is cool and dry. Because when hot humid air meets cool 72 degree lumber it condenses and sets on floor joists, the bottom of the floor and on the walls. This results in mold, mildew, rot and termites. A green home must have dry spaces throughout the entire home. So we insulate the interior of the crawl space, which controls the temperature. We also insulate the exterior, seal it from air penetration, and seal it from moisture with a vapor barrier on the crawl space floor. To completely eliminate the possibility of condensation, we condition the crawl space and make sure the temperature is the same on both sides of the floor.

The insulated attic:

Most homes have an estimated 6 to 10 square feet of cracks and openings where energy is lost. Many of those openings can be found in the attic where ducts and electrical wiring create opportunities for energy loss. Because heat rises, it is especially important to control the temperature in the attic. So we not only insulate the attic space and seal the air barrier, we also condition the attic space so that it remains free from condensation. Our goal is to push the temperature differential to the exterior of a home where it can't do any damage.



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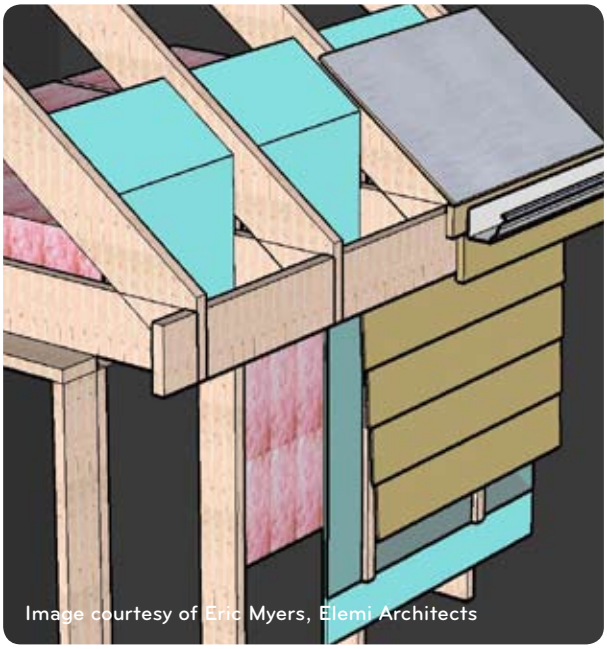

Image courtesy of Eric Myers, Elemi Architects

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sealed barriers

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sealed barriers

A Whole Systems Approach means building a home with a tightly sealed air barrier that protects the inside of walls from air infiltration and condensation. Using traditional building materials, we are able to stop air leakage and reduce a home's energy consumption.

The sealed air barrier

Between a home's interior walls and its exterior sheathing, there are many opportunities for air leakage. And air moving through walls is always bad. It not only causes energy loss, it causes condensation to set on framing materials. A sealed air barrier is a simple framing technique that prevents air flow through walls.

We simply glue the exterior sheathing to the home's framing. We also use a continuous sealant, adhesive or gasket to attach the interior wall finish to the framing. And around ducts, pipes, wires and other small openings, we spray open-cell expanding foam to completely eliminate air flow. The sealed air barrier creates a tight building envelope and a stronger wall structure. Resulting in a green home that consumes one-third less energy than a home built with conventional methods.

Image courtesy of Eric Myers, Elemi Architects

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rain screen siding

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rain screen siding

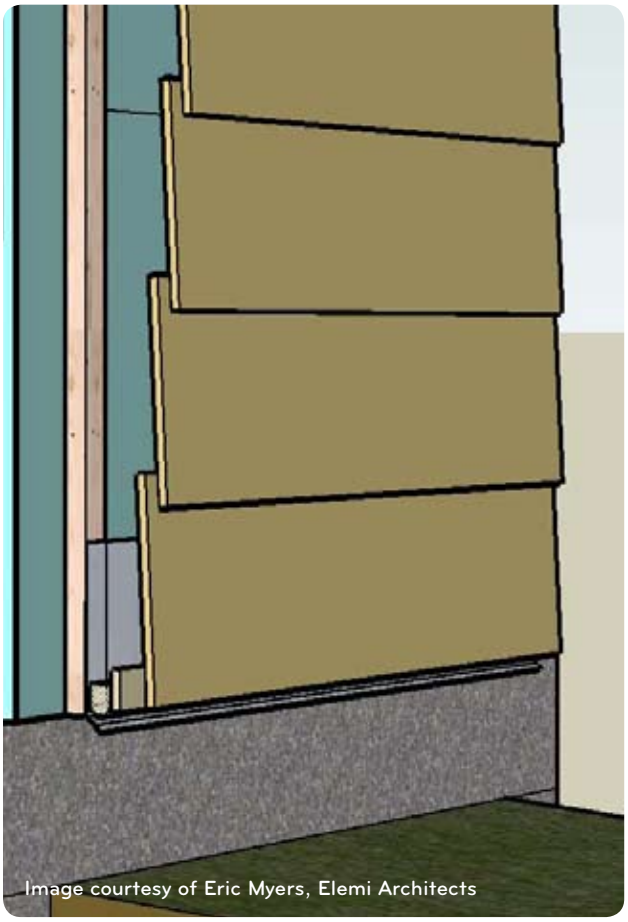
A Whole Systems Approach means engineering a home that will last over 100 years without repair. To build long lasting and healthy homes, we have to stop even the smallest amounts of moisture from doing a lot of damage. With our Whole Systems Approach, the Rain Screen Siding System is the last best defense against moisture.

The Rain Screen Siding System

What happens when very small amounts of water get trapped behind a home's siding? Well over time, moisture causes tremendous damage by changing back and forth between vapor and liquid, moving from one area to another, causing rot, and eventually destroying the home's exterior.

To prevent moisture damage, we wrap the home with a high-density polyethylene material that is water resistant and vapor permeable so that moisture can't be trapped on either side of the wall. We install vertical strips of wood between the wrap and siding to create an open space that acts as a drainage plane for any condensation that does occur.

With a rain screen siding system, any condensation that occurs behind the siding runs down the wrap to a piece of flashing that lets it escape from behind the siding. Because the wooden strips create an air space, drafts of outside air can enter behind the siding and dry any additional condensation while pushing hot humid air out.



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