CHAPTER 6

Floor Framing and Subfloor

When using a green approach to building a framing and subfloor system, the material choice is critical. There are several approaches that can ensure that the floor frame will be durable yet healthy for the environment and the occupants.

Green flooring choices generally do not require any changes to the home's design. You may simply substitute the better, more durable, environmentally efficient material for the conventional material during your installation process.

Some areas now specify metal framing to meet building codes. When possible, use green materials as suggested for non-metal components. Steel studs are a good green choice as well for vertical applications.

Implementation of Green Floor Framing and Subfloor Installation

- Avoid using dimensional lumber greater than 2" x 10" for floor framing.
- Use oriented strand board (OSB) for subfloor and sheathing.
- Use urea-formaldehyde–free material.
- Avoid use of underlayment.
- Substitute solid sawn lumber with engineered lumber.
- Use certified wood (Forest Stewardship Council (FSC) certified is commonly available and trustworthy) for framing.
- Use wood I-joists for floors and ceilings.
- Use finger-jointed, engineered, or steel studs for vertical applications.
- Use reclaimed lumber from demolition.
- Use web floor trusses.
- Design energy heels on roof trusses 6" or more.
- Use micro-lam beams and micro-lam I-beam floor joists.
- Ensure that all wood is at least 12" above soil.
- Use low-VOC finishes and adhesives.
- Use a moisture barrier under a concrete slab floor.
- Consider using insulation under a concrete slab to provide thermal mass.
- Add up to 35% fly ash to the concrete mix.

FAST FACT

Oriented Strand Board (OSB), is a panel product made by gluing and high-temperature pressing layers of thin wood chips, with each layer oriented at a right angle to adjacent layers. When used as subfloor material it is strong, rigid, and impact-resistant for underlayment, carpet, or tile. Traditional plywood uses prime, big logs from new growth as opposed to OSB that uses waste products.

Source: http://www.osbguide.com/hconstruction.html

Low-VOC

VOCs (volatile organic compounds) are airborne gases like formaldehyde and acetone contained in solvents such as paints and adhesives that are released as the material dries (off-gassing). Exposure to these gases is associated in scientific studies with respiratory, allergic, or immune effects in infants or children among other health concerns.

The EPA's definition of "low" is based not on an indoor health standard but on an outdoor environmental standard. "Low-VOC" implies less than 250 grams of VOCs per liter for latex paint, and less than 380 grams per liter for oil-based. These levels are far higher than those recommended by many environmental and health experts.

To find a paint's VOC content, look at the label or the material safety data sheet.

Source: http://www.utne.com/pub/2006_136/promo/12178-1.html

Benefits of Green Floor Framing and Subfloor Installation

- Guarantees long-term availability of precious woods.
- Using low- or no-VOC paints and coatings reduces pollutants in the indoor environment.
- OSB reduces the need for large diameter old-growth trees, is as strong as plywood sheet material, and is less expensive.
- OSB reduces air leakage relative to frame construction, is energy-efficient, provides excellent soundproofing, is erected quickly, and saves wood by eliminating much of the conventional framing lumber.
- OSB uses recycled content materials, is straighter and stronger than solid sawn studs, and eliminates crooked walls, thereby reducing material waste.
- Fly ash increases the strength and durability of the concrete and reduces the amount of cement needed.
- Concrete slab flooring will not twist, warp or split, is stronger than 2x10s or 2x12s, and can span greater distances.

Link and Learn

Green Remodeling Illustrations can be found in chapter 5 at:
http://www.stopwaste.org/docs/remodeler-c5.pdf

Johnston, David and Kim Master, LEED AP. *Green Remodeling, Changing the World One Room at a Time*. New Society Publishers

Wikipedia, Oriented Strand Board:
http://en.wikipedia.org/wiki/Oriented_strand_board

Wikipedia, Volatile Organic Compound:
http://en.wikipedia.org/wiki/Volatile_organic_compound

Pagés Ruiz, Fernando. Ecohome Magazine, Jan-Feb 2010. *Greening the Shell: How plywood and OSB stack up in the search for sustainable sheathing*.

GreenBuildingAdvisor.com. Interior Walls and Floor Framing Affect a Home's Livability:
http://www.greenbuildingadvisor.com/green-basics/interior-walls-and-floor-framing