



Designing sustainable stuff into timber frames

Men are haunted by the vastness of eternity, so we ask ourselves:

“Will our actions echo across the continents? Will strangers hear our names long after we are gone and wonder who we were?”

Welcome to the sustainability column with a new name to reflect the marriage of technology with nature, using ecology as the basis for design. Eco-logic is a term coined by Sim Van der Ryn, an accomplished architect and leader in sustainable design who spoke at the Western Conference. After Sim’s Eco-logic keynote presentation, I presented a session on incorporating mainstream sustainable technology into timber frames. These sessions were highly attended with great interest. This essay will tackle the concept of Eco-logic and how you might design and implement sustainable technology for competitive advantage.

I have been a fan of Sim Van der Ryn for years, first noting his appointment as California State Architect by Governor Jerry Brown. In this role, he developed the na-

tion’s first government-initiated energy-efficient office building program. With his audacious vision, California developed energy standards and disability access standards that have since been incorporated into the Model Energy Code within the International Building Code and the Federal Americans with Disabilities Act. Yet Sim is a humorous and humble man. One senses those qualities in his demeanor. Sim hit a chord with me and, it appears, with our members.

According to Sim Van der Ryn, to bear fruit we must ground our technology in nature. I hope to put into practical terms the ecological design principles espoused by Sim and then illustrate how one might incorporate these design features into a frame. As a challenge, I ask you to consider these suggestions in your current project, regardless of its location, size, function, or state of completion. A designer must first observe, and then attempt to reinforce, the unique qualities of place.

Next, consider your design decisions in terms of their environmental impact. This environmental accounting balances long-term costs of systems and materials with

their environmental impact. Throughout the design process, strive to mimic nature. (For more on this concept, go to www.biomimicry.net, or read the book by Janine Benyus, *Biomimicry: Innovation Inspired by Nature*, 1997.) Be receptive to every member of the design team. Encourage independent thought and opinions. Sim would say, "Honor every voice." Making nature visible in a design transforms both makers and users, and it reinforces the sense of place. While these ideas are straightforward, very few designs comply with eco-logic principles.

Let us look at a typical timber frame home. The timber framer meets with the owner in the pre-design stage. Without regard to site, the owner presents some pictures from the latest trade magazines and some sketches with slightly modified floor plans from a grocery-store plans book. The estimator and timber frame company owner—often the same person—review the conceptual design, decide on the technical implementation of a frame, and quote a price to the owner. Often concepts such as renewable harvesting, recycled wood, hand craftsmanship, exposed timber, and McCartyism are thrown in to enhance the impression that timber framing is good for the environment. The owner signs a contract; perhaps an architect gets involved. A site is found. Plans are created and approved, permits obtained. The house is oriented so that the tall windows in the great room face the views. A hole is dug. A foundation is built. A crew cuts the frame. A crane is ordered and the frame raised.

A pine branch is lofted to the gable peak, everyone climbs on, and the owner takes a picture. The picture is put in a book honoring the frame, its designers, and its builders.

Everything else to complete the house, from subcontractors to materials, methods, and systems, are the same as the American stick-built production home. At a higher acquisition cost, the ecological impact of this timber-framed home is no different from its stick-framed counterpart.

The client's needs—whether or not expressly stated—are affordability, improved indoor air quality, comfort, safety, and reduced operating costs in the form of energy efficiency. Were they sold another form of the McMansion with a great room of floor-to-ceiling glass enveloped by big pieces of wood, or did someone make a real difference for the client, our industry, and the environment?

Now consider how an environment-friendly timber frame company (TFC) using eco-logic would approach this process. Sim Van der Ryn would suggest that the goal of the first meeting is to "establish an interactive partnership with the client to give voice to their values." The TFC would then match the vision and values with criteria for sustainability. In determining functional requirements and phased priorities (e.g., schedule), the budget represents a balance among vision, values, and intentions.

The client and TFC would visit the site together in order to understand the context, ecology, health, and restorative possibilities of the site. To better understand site relationships and adjacencies, they purchase a 1-meter-resolution IKONOS satellite image of the site from Space Imaging, Inc. (www.spaceimaging.com). The team develops a summary map (ideally hand-drawn on sketch paper with the satellite image underneath) showing soils, geology, topography, vegetation, hydrology, solar exposure, and microclimates. They may consider the entire watershed as well as an owl's nest on the site. From this analysis, the owner and TFC better understand opportunities, constraints, and site potential. A potential outcome, for example, may be building orientation. While the best views may be to the west, perhaps suitable views to the south would enable passive solar heating, with a focal point from a public place exposing the owl's nest. Given suitable soil conditions, the TFC might suggest planting some large deciduous trees on the south side of the house to improve summer cooling without affecting passive solar heating. Site excavation would be modified to insure that the foundation drained to open space, out of view, with minimal impact on local habitat.

Serving as eco-consultant, the TFC may suggest exploring renewable and non-toxic (yet proven) systems and materials. Although neither general contractor nor specialty trades contractor, the timber framer can discuss readily available information with the homeowner. For example, the team may agree to mandate the use of low-VOC (volatile organic compounds) paints and adhesives; that subcontractors use locally-produced and recycled materials where possible; and that the HVAC and hot water systems take full advantage of the solar exposure, site soil conditions, and zoning to insure energy efficiency and comfort. The TFC could then suggest technologies that might meet these criteria—radiant floor heating or geothermal heat pumps for heating, cooling, and hot water generation. While not experts on these technologies, timber framers who understand them become valuable advisors to their clients. Finally, the design team (the owner, TFC, architect, landscape architect, and specialty subcontractors) incorporates the vision. Through an iterative process synthesizing the program,

site, resources, systems, materials, and budget, a design evolves that communicates the original vision and intent.

Along with higher profitability and significantly reduced risk, the timber framer endears another client for life—literally. The owner benefits from lower life cycle costs (like reduced energy consumption), higher productivity, and a safer and healthier home environment. The environmental impact is reduced dramatically.

I forewarned my audience at Mount Hood that they would be drinking from the fire hydrant, as there was too much information to present in 90 minutes. Similarly, space here is short, and much more is involved in this process. I sincerely desire feedback; I am working on hosting a one-day or one-week seminar connected to a Guild event in the future. If you find these concepts intriguing, email or call me, or show up in Angola, Indiana, for some eco-Amish cooking. I'll be there.

—Al Wallace

Salem thanks

THANK YOU to all of the participants at the Salem rendezvous. We're planning to collect images, thoughts, and memories for a full recollection of the event. Please send comments, criticisms, lost and found items, and images to Curtis Milton.