



Workers pause to look at whales during frame assembly of the Honomu House in Hawaii.

A Steel Chassis for a Stronger, **Greener** Future

an interview with HabiTek founder Greg Higgins

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By Tanoa Rodgers

Prevailing construction methods are largely unable to surmount our current environmental challenges. Eroding coastlines and increased demand for easy-to-integrate green technology require new approaches to housing.

To meet that challenge, one architect-turned-inventor has created a strong, environmentally responsible construction system that can be erected easily and quickly. HabiTek L.L.C., founded by Greg Higgins, a Spokane, Washington architect, is poised to

revolutionize the way we think about housing in the twenty-first century.

HabiTek applies modern materials and technology to age-old post-and-beam construction methods. In its most basic form, the system consists of just four components arranged modularly to create a chassis on which the shell of a home can be created.

These four components—posts, beams, hubs, and brackets—are bolted together to form an incredibly strong steel ‘skeleton’ on which several types of

prefabricated wall, roof, and floor panels can be attached. The novel aspect of this approach is the company’s patented universal HUB that connects interchangeable posts and beams and makes the system eminently flexible. This flexibility allows for an almost infinite variety of floor plans while never losing the benefits of prefabrication.

Further, the prefabricated nature of the steel components means that the entire frame can be assembled quickly even by relatively unskilled workers. With

practice, an assembly crew can erect the framework for a 2000 square foot home in just three to four days.

I sat down with Greg Higgins to discuss the implications of the “erector-set” HabiTek system and how it can contribute to a greener future.

TR: First, why steel? Isn't wood the more obvious choice?

GH: Pound for pound, steel is almost twice as strong as wood requiring fewer and lighter parts. In terms of shipping costs alone, the benefit is obvious.

Steel is also remarkably versatile and workable. Unlike wood, it is always straight and true with predictable strength—a big relief for builders, inspectors, and engineers. In fact, we have had topnotch engineers working on the HabiTek system throughout the product development process.

However, the HabiTek system should not be confused with common light-gauge steel framing. Our steel members are heavier gauge, and the post-and-beam frame is bolted instead of screwed. Hence, assembly requires much less time and labor, and connections are less likely to separate in hurricane and tornado level winds or during earthquakes. In places like Hawaii and the Gulf Coast,



Architect Rafi Samizay's, AIA, 'Country Cottage' uses the HabiTek steel frame system on the St. Maries River near Santa, Idaho.



where termites are a huge problem, steel can make a big difference.

Don't get me wrong; I love wood, and the HabiTek system uses it in many ways, but just not for the load-bearing structure. Our approach, steel plus wood, is called a hybrid system. We even plan to use log infill between the steel posts for mountain cabin designs.

TR: Why is it easier to build with HabiTek?

GH: We prefer to use the term assemble, rather than build, at least at the framing stage. It is easier because the steel components are precut and prepunched. Everything comes together as planned—straight, level, and true. On job sites, I have to ask the crews to put away their measuring tapes. The dimensions between posts, beams, and floors are fixed and the system is self-leveling.

Smaller homes or cabins may even be assembled as DIY (do it yourself) projects. Our first prototype, a small cabin on the Coeur d'Alene River in North Idaho, was assembled by family and friends: a barn raising of sorts.

By the way, in special cases such as intermediate-term shelter, the framework can be disassembled and the components used later for permanent housing. The HabiTek framework can also be designed with future expansion in mind.

TR: What about styles? Are builders limited to one prefabricated style?

GH: Most prefabricated homes are closed systems; as a homeowner, your

design possibilities are severely limited by the vision of the designer who made your prefabricated home. In contrast, the HabiTek system is open; it allows users to create their own designs according to their own needs.

With HabiTek, virtually any style is possible. In climates such as Hawaii or the Caribbean, Tropical Plantation, Bali, or Haiku styles come to mind. As an architect, I'm partial to modern designs, but it is important to note that the HabiTek system is like age-old timber frame construction, with steel substituted for timbers. The traditional Japanese house, which has influenced many Pacific Northwest architects including myself, is timber frame albeit highly refined.

TR: I've heard that steel has high-embodied energy. Would you consider HabiTek to be a green building system?

GH: Absolutely. The steel we use is between 20% and 80% recycled, and is 100% recyclable. The fabrication process used to prepare the components and the erection process greatly reduce waste. What's more, steel's lifespan is pretty much forever, requiring little or no maintenance. That's why steel received a positive rating by the U.S. Green Building Council.

HabiTek is also an outgrowth of work I've done in the past designing passive solar homes and greenhouses. At the time, I felt then that a key element missing was a chassis that could easily



Applications on flood plains

This cabin on the Coeur d'Alene River in Idaho was built on a flood plain. As shown below, it could have been constructed with log infill between the steel posts.





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The Kehena House in Hawaii under construction.



accept energy-saving technology and green components. I set out to develop a framework, or chassis, that could readily integrate components such as solar panels, solar hot water systems, and even small wind turbines. The HabiTek steel framework is the result.

TR: How else would you define HabiTek as green?

GH: The steel system is especially suited for applications on environmentally sensitive sites. Traditional construction techniques could destroy these sites, considering the significant amount of site disruption required. Just as problematic, a marginal site such as an eroding coastline could destroy the home itself.

Our system adapts to sites that would otherwise be difficult or impossible to build on. In a world in which climate change makes land ‘marginal’, HabiTek is increasingly relevant.

TR: Can you give me an example of this adaptation at work?

GH: HabiTek’s post-and-beam framing system has been designed specifically to be anchored to concrete piers. The

system can be used for all types of foundations, but is especially well-suited for elevating structures on piers. These homes can be successfully built in hurricane regions, on lake and river frontages, or directly in flood plains.

In Hawaii, where we completed two projects, many homes are required to be elevated to minimize site disruption. In any coastal region, it is common sense to build in this fashion. Climatologists have reported that sea levels are rising faster than previously predicted. HabiTek offers a means to adapt to this new reality.

TR: Are all HabiTek projects elevated?

GH: Our first project, a vacation home on the St. Maries River in Idaho, was on a flood plain. It is elevated on twelve concrete piers. The Honomu House and the Kehena House in Hawaii are both partially elevated and partly anchored to typical foundation walls. It has been important to work out the details for all foundation types, but we plan to emphasize piers and establish HabiTek as ideal for sites prone to flooding.

From an environmental standpoint, the HabiTek system is thus incredibly

versatile. Many people here in the Pacific Northwest are concerned about the damage done to lakes due to the rapid development of shoreline properties. HabiTek is the alternative: building on piers not only means less excavation but less concrete as well, greatly reducing environmental impacts as well as cost.

TR: It sounds like HabiTek is ideal for hurricane-ravaged or earthquake-prone regions, such as the Gulf Coast or China’s Sichuan Province.

GH: Yes, of course. Likewise, Caribbean resort developments would be an ideal application of this technology. We plan to bring the HabiTek system to any place prone to hurricanes, earthquakes, and even rising sea levels. Providing stronger, safer, more environmentally sound habitation in such regions is the challenge we have set for ourselves.

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