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Beauty & Sustainability

Producing Original and Inspiring Architecture

by Paul Raff



In much of the work I do as an architect, aesthetics and sustainability are intertwined. I find that the process of thinking through the ways that I can make a building environmentally sustainable can be very fruitful in terms of producing original and inspiring architectural forms.

Beauty and sustainability are often compartmentalized, but if considered together, they can be used to create things of tremendous value to people. Moreover, as I have seen with many of my clients, there is a growing desire for the marriage of these intentions in both new builds and the renovation of older properties.

I believe that good design is by nature sustainable: projects that last a long time and which perform efficiently are a good use of resources. Ecological, social and economic sustainability are integral to all of my projects. I always strive to harness free and clean energies such as the sun and wind; to use local and non-toxic materials; and to apply quality construction techniques to economically achieve best-practice ecological results.

Let's examine one of my studio's first projects, Cascade House, a home I was commissioned to design from scratch. While it is known for its modern but visually rich aesthetic, the sustainable design innovations that informed its appearance are often overlooked.

Cascade House is precisely oriented to optimize what is called "passive solar design." By configuring it in an L shape to create southern exposure, the home's large south-facing windows harness the winter sun to heat the building. Its dark stone wall interior acts as a passive heat-sink because of the

attention paid to sun angles in its design, absorbing warmth and emanating it through the house overnight.

This passive heat-sink is combined with a high-performance building envelope so that it operates very energy efficiently. The wall is also perforated so that it reduces glare, while dappling the rooms behind it with light. This contributes to an overall quality of lovely natural light throughout the home. Employing these design solutions to improve its environmental performance drove the aesthetic of the home's unique exterior, characterized by its signature green glass "cascade wall."

Good design is by nature sustainable.

Furthermore, while we harnessed natural light passing through the cascade wall into the home's interior to reduce energy use, we also used it to imbue the living spaces with the feel of an impressionist painting, giving them colour on even the greyest winter days. Here again we see how sustainability and aesthetics can work in tandem to create beautiful effects.

Cascade House also used durable, mostly locally sourced, non-toxic materials that ensured longevity. For example, a structural insulated panel system (SIPS) was used to provide high thermal resistance, without long-term moisture problems. The timber-based SIPS deployed for this building had rarely, if ever, been used in the house building sector of our local economy. Stone cladding, concrete floors and aluminum windows were all chosen to increase the durability of this home, both improving its sustainability and shaping its modern aesthetic.

While sustainable design informs all of my new construction projects, I also apply this thinking to designing home renovations. There are millions of houses and buildings throughout the world that could be improved by sustainable design practices, not only in terms of their environmental impact, but by their form, function and flow. In other words, how they support family life and day-to-day activities, while facilitating pleasurable activities like cooking.

Opposite: Cascade House marries energy efficiency with beauty.

Above: Cascade House front exterior.

Right: Echo House exterior.

Photographer: Ben Rahn/A-Frame.



A good example of this is a home renovation my studio designed known as Echo House. This home was originally built in the 1950s, and over the years had multiple ill-informed renovations that disconnected it from the stunning landscape surrounding it and made it far more energy intensive than necessary.

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We can do better.

My approach was to conserve the best attributes of the existing property by employing sophisticated architectural design techniques. Beautiful rolling meadows and a gorgeous variety of mature trees had been made inaccessible by the home's structure and layout, creating no sense of flow into the garden space. Orchestrating a very considered but no-holds-barred reconstruction created a subtle, dramatic and refined family home, newly reoriented to the outdoors and characterized by serene and sculptural forms.

An approach to design that integrates nature is often a key motivation for my clients interested in environmental sustainability. We should not underestimate the connection between an appreciation of natural beauty and the desire to preserve it.

The carbon footprint of the house prior to its transformation had also been unnecessarily expanded through these numerous previous renovations, making the home incredibly inefficient in terms of energy use. Excessive skylights meant that the house baked in the sun, requiring the owners to consume an absurd amount of energy through their air conditioning system. To address this issue, my renovation design included removing these skylights and adding abundant windows in more suitable locations throughout the house.

The renovation also followed the owner's request and my own mandate to be ecologically sustainable. For example, the building's refurbished exterior envelope exceeds contemporary high-performance standards for insulation, while contributing to the home's Asian-inspired aesthetic. We also created Echo House's signature privacy screens by fabricating them from reclaimed Douglas fir, providing privacy for the guest bedrooms,



Echo House Interior. Photographer: Ben Rahn/A-Frame.

while allowing them discreet garden views. Again, here we see the way sustainable solutions informed the aesthetic of the home.

This strategy of rigorous and systematic improvements to the existing structure, in combination with a new high-efficiency heating, cooling, and ventilation system, resulted in a greater than 50 percent reduction of the house's energy consumption, producing a spacious and environmentally responsible home with an alluring aesthetic.

I became an architect to design unique and beautiful buildings because architecture shapes our everyday lives and experiences. A building's impact on the environment is huge — today, buildings account for 40 percent of the world's energy use. We can do better. We can design cost-effective buildings that perform on many levels, including their carbon footprint, comfort and longevity, while still making them beautiful sculptures for living. I call this "integrity based architecture."

These are not new concerns in architectural design, but the degree to which we consider them at the same time is a new focus in the field. People want homes that are built to stand the test of time, both ecologically and aesthetically. They want homes that are integrated with their surroundings, and which harness the power of the environment instead of fighting it. They want homes that can leave a legacy for their children, not just in terms of ownership, but also for the impact on the planet those children will also inherit.

Paul Raff is the founding principal of Paul Raff Studio.

The Studio is an internationally recognized leader in sustainable architecture, art, and design, and has been recognized with numerous awards by the highest authorities, including the Royal Architectural Institute of Canada and the Canada Council for the Arts.

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