A WAY FORWARD

Biophilic Design and Sustainable Flooring in Higher Education Facilities

by David Vinson

The Youghiogheny River—or the Yough, to which it is most commonly referred—extends its reach from the west side of the Allegheny Mountains in southwest rural Pennsylvania, down through the southwestern corner of Maryland, until it crosses the border into West Virginia, where its waters are absorbed by the tributaries of the Mississippi.

At the northernmost point of the Yough, along a five-mile stretch of water and rocks and steep plateaus called Bear Run, Frank Lloyd Wright designed Fallingwater in 1935. He was hired by the Kaufmanns, a prominent Pittsburgh-based family that desired a remote vacationing spot in Pennsylvania. Upon its completion in 1938, Wright would land the cover of *Time*, posing with his illustration of Fallingwater. Nearly 70 years later, *Smithsonian* would include Fallingwater among its "Life's List of 28 places to visit before you die."

Key Lessons from Fallingwater

If you'd like to see your higher education facilities transformed into beautiful, safe, and innovative living and learning spaces, key lessons can be learned from Fallingwater, not only in terms of the aesthetic value in its naturalistic design but also in regard to the wide-ranging benefits (physiological, psychological, and economic, to name just a few) that such a design can produce.

Fallingwater is surrounded by the dense flora of the Appalachian Oak Forest, and its design

echoes a natural pattern established by neighboring rock ledges. In this case, cantilevered concrete "trays" are stacked, together forming a mass sturdy enough to overlook the waterfall that rushes *beneath*—rather than above—the structure. It is a thrilling design, one that defies the laws of nature.

Wright's legacy is one of innovation, but he also had a sizeable ego. Fallingwater, however, is not simply a reflection of Wright's hubris, his ambition to conquer nature. Its conception is derived from his wish to create architectural harmony between human habitation and the natural world.

Wright called this harmony "organic architecture," and within it he sought to achieve a sensibility of space in which the site, the structure, and its furnishings all become part of unified, interrelated composition. The structure rises more than thirty feet above the falls, and yet its strong horizontal lines and low ceilings produce a safe, sheltering effect. The outdoor terraces, which are almost the same square footage as that of the indoor space, bring the natural environment into the house just as they also entice its inhabitants out.

Biophilic designers work to reproduce the harmonizing impact of nature, and they do so by creating interior spaces that are inspired by natural materials and patterns. With biophilic design, one can transform higher education facilities into safe, sustainable, and beautiful living and learning environments.

Biophilic Design and Organic Architecture

Biophilic design is an extension of the values inherent to Wright's "organic architecture"—particularly, that nature holds the key to our aesthetic, intellectual, cognitive, and even spiritual satisfaction. Biophilic designers work to reproduce the harmonizing impact of nature, and they do so by creating interior spaces that are inspired by natural materials and patterns. With biophilic design, one can transform higher education facilities into safe, sustainable, and beautiful living and learning environments.

An ideal biophilic space contains windows that overlook lush natural spaces, that likewise can be opened at ease to create desired ventilation and temperature. A direct view of nature also orients the occupant with day and season. Indoor plants can be used to encourage a direct relationship to nature and make possible a multisensory experience, one not only tactile but also olfactory and visual. Water features may also be used to similar effect.

Challenge:

Incorporating innovative, state-of-the-art sustainable technologies to optimize comfort and indoor environmental quality while keeping long-term operating costs to a minimum.

Worcester Polytechnic Institute Sports & Recreation Center

This award-winning facility has been credited as being one of the greenest sports centers in the nation.

WPI Sports & Recreation Center is an environmentally friendly facility containing a 38-meter pool, a fitness center, a four-court gymnasium, an indoor running track, rowing tanks, racquetball and squash courts, dance studios, and offices and meeting spaces for the coaches and staff. The center is home to the wrestling team as well as the practice facility for men's and women's rowing and varsity team training.

Sustainability is important to WPI which boasts several LEED certified facilities on campus. The school has a broad reaching sustainability planning process which includes students as well as faculty. Faculty members have incorporated sustainability into many student projects and focused on various aspects of sustainability around the world. In 2012 alone, some fifty-one energy-related projects were completed at the school.

Biophilic Design and Sustainable Flooring

Designers are fully aware that not every space can be Fallingwater, and further, that not every space is made to accommodate the ideals of biophilic design. Perhaps you are envisioning your own campus and nodding in agreement.

But even the most inhospitable spaces can be transformed into comforting and harmonious environments inspired by nature. One simple and effective solution is the use of sustainable flooring, which is produced from sustainable materials and by a sustainable process, and which in turn reduces demands on ecosystems during its life cycle.

As the base or the platform of all interior space, the floor plays a critical and versatile role in biophilic design. Natural flooring materials such as wood, linoleum, or bio-based flooring reflect light, provide warmth and comfort underfoot, and can even benefit your immediate health. The Asthma and Allergy Foundation of America recommends those with allergies to dust or other particles to choose flooring with smooth surfaces, which the versatility of sustainable flooring can provide.

Hardwood and stone bring nature into interior spaces, and like linoleum or other bio-based flooring, sustainable flooring can be used to simulate the variety of landscapes that one may encounter in nature. One may wish for a space that offers unimpeded views over a distance, or for the opposite, to create a sense of refuge or retreat, which can be achieved with segmented flooring.

Another option is a flooring design that creates mystery, that invites others to explore the nature of the space. Flooring can contribute to biophilic design by adopting colors and textures found in nature and by creating transitions commonly witnessed in nature.

Nurturing the Human-Nature Connection

While the aesthetic possibilities of biophilic design and sustainable flooring are exciting, research suggests that creating an interior environment that nurtures the human-nature connection can also benefit one's physiological and psychological well-being. Something as simple as hard surface flooring placed near a window can reflectively drive daylight further into a space, thereby improving mood and even reducing the risk of nearsightedness.

High light reflective flooring can also help the environment by reducing the energy needed to illuminate an interior space. In the Human Spaces' 2015 report, The Global Impact of Biophilic Design in the Workplace, employees in biophilic spaces reported a higher level of well-being, were found to be more productive, and even expressed feeling more creative.

Additionally, "The Economics of Biophilia," a report by Browning et al., showed that integrating naturalistic designs into an office space can save over $2,000 per employee per year in office costs, whereas over $93 million could be saved annually in healthcare costs.

The same report finds that harmonious biophilic design in learning environments facilitated a 20-25% increase in learning rates,

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improved test results, concentration levels and attendance, and reduced impacts of ADHD. The research makes a strong case for using biophilically designed spaces and sustainable flooring to improve human capacity, overall wellness, and job-specific functions.

More Than a Fad

Biophilic design and sustainable flooring represent much more than a fad in the design world. Together they signal a way forward, a clear and doable strategy for contributing to a cleaner environment and for providing a happier, more rewarding campus experience.

ABOUT THE AUTHOR: PUPN staff writer David Vinson has a PhD in English with specializations in transatlantic literature and cultural studies. He is a committed scholar, teacher, husband, and dad. If you ever meet David, avoid the subject of soccer. His fandom borders on the truly obnoxious.

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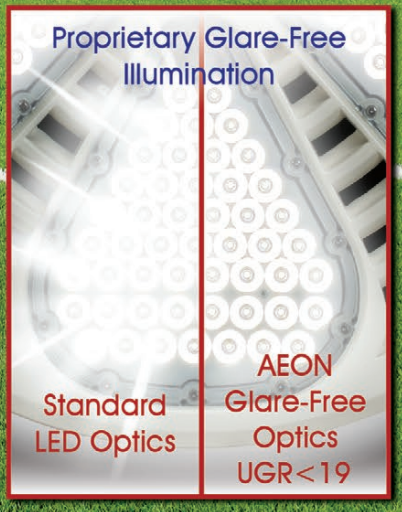

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