**A Way Forward: Biophilic Design and Sustainable Flooring in Higher Education Facilities**

by David Vinson, PhD

The Youghiogheny River—or the Yough, as it is commonly called—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 the building’s completion in 1938, Wright would land the cover of Time, posing with his illustration of Fallingwater. Nearly seventy years later, Smithsonian would include Fallingwater among its “Life’s List Of 28 Places to Visit Before You Die.”

**Key Lessons from Fallingwater**

For those who would like to see 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. This thrilling design 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 and 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, yet the 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 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; the windows can also be opened at ease to create desired ventilation and temperature. A direct view of nature also orients the occupants 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.

**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. Even the most inhospitable spaces, however, 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 people’s 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 and 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 the inhabitants’ 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; 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.

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