





GREEN CONSTRUCTION & CAMPUS ATHLETIC FACILITIES

by David Vinson

If you count your institution among the private universities and colleges that share in the core values of providing the most beautiful, cost-effective, and ecologically friendly amenities possible, you would be wise to take note of what Sustainable Construction practices can do for your on-campus Athletic Facilities.

Sports Venues Minimizing Their Carbon Footprint

But before directing our attention to the on-campus impact of Green Construction, let's first take a more expansive look at what sports venues around the world are doing to minimize their carbon footprint, preserve their green legacy, and take the lead in innovation. Sports venues such as the Amsterdam ArenA, Mercedes-Benz Stadium, Levi's Stadium, and the Golden 1 Center are pioneers in the promotion of sustainability, but perhaps even these do not equal the Allianz Arena of Munich. The Allianz represents what's possible in Green Construction, and it is widely recognized as one of the most spectacular athletic facilities in the world.

Unabashed in its modernity, the Allianz is a high-tech marvel that looks from the outside like an enormous golf ball sliced in half, or perhaps like a mysterious, light-weight airship destined for interstellar travel. It is home to FC Bayern München, the most storied soccer club in Germany and by a wide margin the most globally viable brand of the Bundesliga (the nation's professional soccer association league).

LED Lighting and Vibrant Turf: Turning Sporting Events into Special Memories

The extraterrestrial quality of the stadium is enhanced by a full color changing exterior, an innovation managed by ETFE plastic panels. (Ethylene tetrafluoroethylene is a fluorocarbon-based polymer that, in sheet form, weighs less than 1% of a pane of glass.) Each panel can be independently lit with white, blue, or red light, and cumulatively the exterior allows for an ever-changing canvas.

A few years ago, I approached the Allianz for the first time by way of a bus that I shared with singing Bavarians, Poles, Austrians, and at least a dozen Japanese women, all of whom wore the jerseys of their favorite players. Miles away, as we exited the Autobahn, I spotted through the window of the bus an orb of bright red, the designated color of the home team, as it emanated from the stadium. The red faded to pink at great distances above, blanketing the entire night sky.

Inside the stadium, where the soccer is played, the field of grass was the greenest, brightest,

crispest organism I've ever seen. A grass so vibrant and fresh you could almost smell it despite the competing odors of hefeweizen, currywurst, and mustard pretzels, not to mention the chemical flares lit by hundreds of visiting Hamburg supporters in the upper tiers of the stadium.

At kickoff, I was struck by the absence of glare on the field, and at night no less, when I fully expected to squint through my glasses while watching the run of play. I would learn later that the Allianz uses LED Lighting, and for reasons that far exceed glare reduction. A plan for the daytime is also designated, in which built-in roller blinds located at the roof are drawn back and forth to protect matchgoers from the sun.

Ranging from its visionary scope to its meticulous execution of that vision, the ambition demonstrated by the Allianz Arena is inspirational. Inside and out, its design represents a seamless forging of aesthetics, local culture, and brand identity—and it manages this in part by prioritizing Green Construction.

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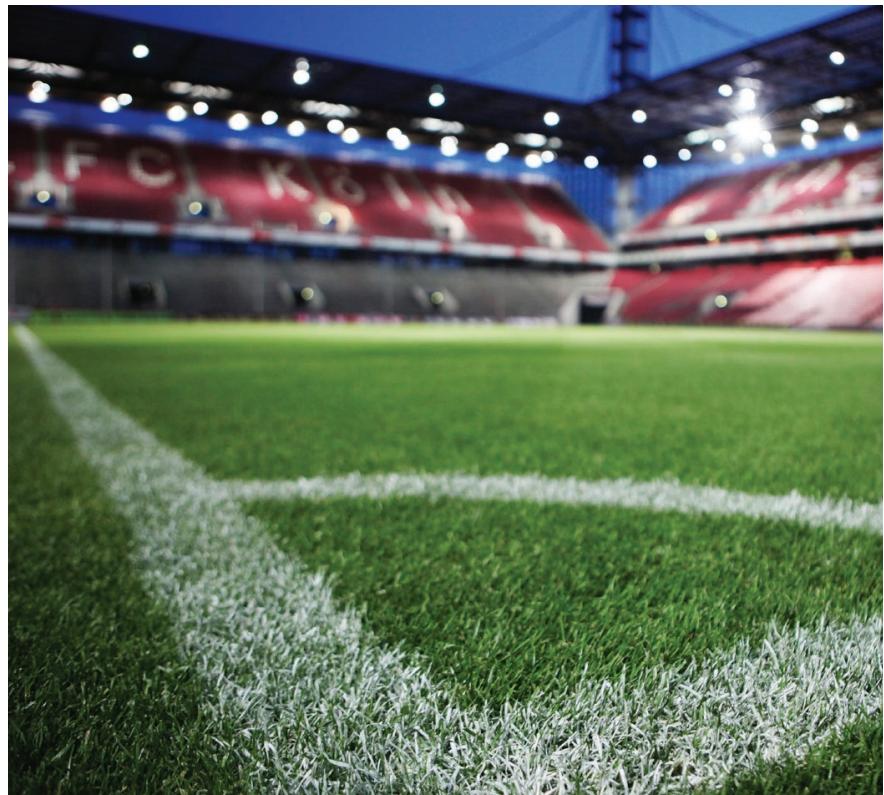


A Model for Prioritizing Green Construction

Green Construction represents a vision put into practice, and it signals a unifying effort to design beautiful, healthier buildings that reduce energy and water usage while improving air quality, providing increased daylighting, and eliminating the potential for volatile organic compounds (VOCs) in building products such as furniture, painting, and carpeting. It also incorporates green and sustainable building materials made from renewable resources, which in turn are recyclable at the end of their life.

The Allianz Arena of Munich uses more than 300,000 LED lights, and these obstruct potential glare and also save more than 60% on electricity and some 362 tons of CO₂ compared with previous technology based on fluorescent lamps. The structure's versatile exterior of ETFE plastic panels offers extraordinary tear resistance as well as transparency to ultra-violet light. Its high translucency transmits up to 95% of light, thereby providing a full spectrum of natural light.

The pristine playing field of the Allianz is managed by a greenkeeper who uses IoT technology. The technology connects to a "cloud," and this interconnective process gives the grass its own voice. It allows



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Cornell University upgraded the lighting system at its Reis Tennis Center with lights that deliver twice the brightness of the previous lighting and use 70% less energy. Lower energy costs save the institution approximately \$20,000 per year.

Bayern to make data driven decisions based on a variety of environmental factors, whether light, temperature, humidity, the lawn's salt content, or even the chlorophyll content of the blades of grass. Solar panels have been integrated into the stadium's nearby multi-story car park, and so thorough is the culture of sustainability at FC Bayern that the club has adopted a reusable cup system, thereby alleviating the unneeded waste of hundreds of thousands of disposable plastic cups each year.

Embracing Green Construction for Athletic Facilities

In the fall of 2019, Washington University in St. Louis completed the installation of solar panels at six major locations on campus, among

them its Athletic Complex. The new solar arrays have added 1.9 megawatts of solar-generating capacity to university buildings, bringing the total figure to 2.5 megawatts across campus. Erika Ebsworth-Goold notes (see "Solar Expansion Continues at Washington University") that 2.5 megawatts would meet the electricity needs of 394 average U.S. homes. This is the emissions equivalent of taking 480 cars off the road.

Beginning in 2008, the athletics department and the Office of Sustainability at Yale University started Bulldog Sustainability, a student-led program whose objectives are to provide short and long-term suggestions for ecologically minded sports operations. The majority of Bulldog Sustainability initiatives

derive from student project proposals, and the students are empowered to research solutions that can have a lasting impact on campus. Since its advent, Bulldog Sustainability has worked towards improving the water efficiency of Yale's field hockey turf and has upgraded the waste management plan for all athletics facilities by adding recycling and composting bins. According to the National Resources Defense Council (NRDC), 80% of all athletics field waste at Yale is mulched for reuse by turf maintenance.

Bowdoin College built an LEED-certified (Leadership in Energy and Environmental Design) ice hockey arena in 2006, the first of its kind in the United States. Bowdoin also treats its athletic fields almost exclusively with organic fertilizer and has installed high-efficiency light fixtures at its basketball courts, track, and indoor courts. Its culture of sustainability includes an athletic shoe recycling project, one that is managed in conjunction with the charitable organization "Rerun Shoes," which supports micro-entrepreneurs in Liberia, Guinea, and Mali, among other locations in West Africa.

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Cornell University upgraded the lighting system at its Reis Tennis Center with lights that deliver twice the brightness of the previous lighting and use 70% less energy. Lower energy costs save the institution approximately \$20,000 per year. As reported by the *Cornell Chronicle*, the old lights of the tennis center took minutes to fully brighten, and they remained lit following evening play. Lanny Joyce, Cornell's newly retired director of Utilities and Energy Management, is quick to remind us that "lighting is the most visible form of energy waste."

The new lights turn on and off quickly and are fitted with occupancy sensors that cover the six indoor courts. Lights automatically shut off following 15 minutes without movement on the court. The shutoff sensors not only save energy but lengthen the lifetime of the bulbs to an estimated seven years as compared with the previous bulbs' two-year life span, a difference that saves Cornell \$2000 annually in maintenance costs.

Eco-Friendly Artificial Turf

Prior to its 2019 football season, the University of Richmond replaced the natural grass playing

surface of its Robins Stadium with eco-friendly artificial turf. Well-conditioned natural grass may be the standard for player performance and safety, but grass on any athletic playing field rapidly deteriorates, becomes worn, unattractive, and potentially dangerous for student-athletes. Water usage alone for upkeep is a hindrance to the movement of sustainability, as well.

Artificial turf offers what natural grass can in appearance, only it is more durable and cost-effective, and the turf itself can offer shock absorption and safety equal to perfectly maintained natural grass.

The 2019 renovation of the Fred Hardy Track, also located at the University of Richmond, now includes an indoor flooring system with a tunable force reduction layer designed specifically for shock absorption. The track contains a wear layer that repels and resists the scuffing of cleats and pyramid spikes, a measure of its durability and one that also benefits the health of student-athletes by curbing the potential for on-track injuries. The flooring system is GreenGuard Gold certified and ensures superior indoor air quality.

A Healthier, Happier Future

Private universities and colleges across America are using Green (Sustainable) Construction to transform their athletic facilities. The benefits are perhaps most intimately felt by the spectators and the student-athletes themselves, and it is the ongoing interaction between both groups that makes campus athletics so exciting and special.

Green Construction facilitates safer and pristine playing conditions, more natural light, less glare with LED Lighting, and cleaner air. Its implementation on campuses aligns with our core values, and it reinforces our collective efforts to provide for students and the community at large the best possible on-campus experiences.



ABOUT THE AUTHOR: PUPN staff writer

Dr. 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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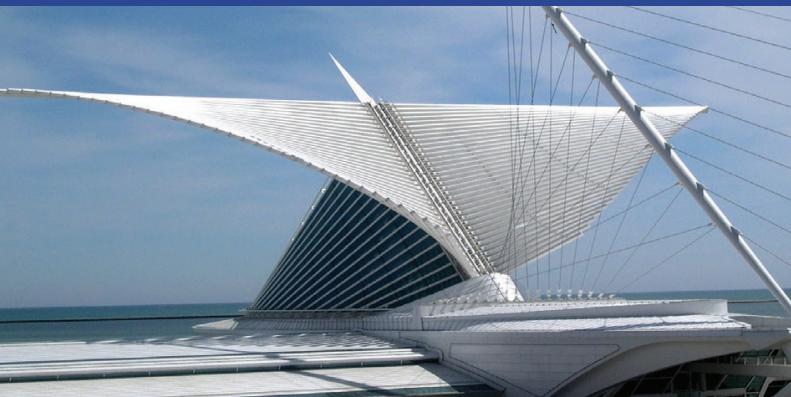


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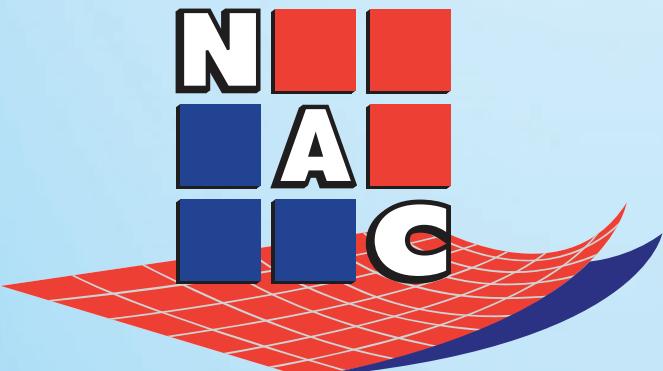
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