



CTGBC Honors the Slate School with *Best In Show*

Front entrance to Slate School / Photo by Ian Christmann / Page 12

INDUSTRY EXPERT ARTICLES



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Publisher's Message



Anastasia Barnes

In this year's Green issue, we're excited to be featuring the people and organizations that are working to educate themselves and others, and taking action to make a positive impact on the environment and the people in their communities.

In this edition, we highlight many of the ways companies and individuals are integrating sustainable practices, including making decisions to live "off the grid," promoting energy-saving processes, and designing educational institutions to protect and educate young people.

I recently attended this year's USGBC MA's Green Building Showcase, which celebrates industry success and innovation. Turn to page 10 to see all of the winners! You can also see CTGBC's award winners on page 8.

This month, I welcomed Antonia

Ciaverella to the Build Better podcast, who shared that 90% of our time is now spent indoors! She talked about the ways a company can achieve the WELL certification, and how prioritizing the health and well-being of all humans will have a positive impact on our communities and the environment.

I also talked with Mark Reed and Stephanie Goldberg of LAB/LSA, whose collaborative design exploration, The Blue Necklace, proposes ways to protect Boston and its surrounding areas from the long-term flooding caused by climate change. They explore how planning ahead can make a huge impact on protecting the city of Boston in the long-term. Listen to both episodes of the podcast now at www.high-profile.com/build-better-podcast.

The 2019 Greenbuild International Conference and Expo will take place on Nov. 19-22 in Atlanta, Ga. The mission of this year's conference is to "put green first" and will feature a keynote speech by President Barack Obama, a Women in Green Power Luncheon, and Resilience and Global & Health and Wellness summits. We hope to see you there!

There is no doubt that climate change is on the forefront of all of our minds.

When faced with this enormous challenge, we as developers and AEC professionals, have an opportunity, and a responsibility, to face it head on and provide solutions that will help reverse the damage, and protect future generations.

"We're excited to be featuring the people and organizations that are working to educate themselves and others, and taking action to make a positive impact on the environment and the people in their communities."

Whether on a personal level or as a corporation or organization, I encourage you to explore the ways you can make a difference. Reach out to your local USGBC to learn ways you can live more sustainably as a resident, or the steps to take in certifying your next project. Let's do this!

Anastasia Barnes

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Cutting Calories and Carbon:

Rethinking Residence Life to Promote a Healthier Campus



by
Blake Jackson

If you lived in a college dormitory, you'll recall the cramped conditions, lack of privacy, and the mounds of ramen that contributed to your "Freshman 15." Whether it's nostalgic to you or not, the college residence-life experience for most is lackluster compared with the impressions left by the main quad or central library.

A wave of new projects is reversing this trend, putting residence halls center stage as students – and parents – demand better services, memorable experiences and, above all, socialization and safety.

Workplace Theory Applies to Campuses, Too

The impact a campus plays on occupant health and wellness is profound. Considering residence halls are where students spend most of their time, their renewed importance offers a key health and sustainability opportunity.

In quantifying the value of time spent indoors by students in the same way that office workers are measured, there is an opportunity to disrupt campus planning

and operations for the better. Evidence-based approaches attest there is a direct correlation between metrics for "success" and an occupant's access to green space, fresh air, natural light, and physical activity. One can argue that quantifying student success this way will impact their academic and personal performance on campus and beyond.

So, what if residence halls were rethought through the lens of workplace health and wellness, considering criteria from the WELL Building Standard and Fitwel?

For example, an area where programming may be added is a mindful eating space with filtered drinking water and healthy, seasonal snacks where 25% or more of the student population within the building or floor could congregate. Such a space would promote socialization and healthy eating without creating redundancy in a full cafeteria.

Biodiversity is another opportunity. In the illustration below, we see the rooftop, with reduced HVAC&R equipment through electrification and heat/energy recovery systems, can be fit with a large photovoltaic array atop a green roof. It can also contribute toward the project becoming net-positive for energy.

From Spartan to Spa

Private quarters can take a page from healthcare, where natural elements, views



This visualization illustrates how campuses can rethink their residence halls' potential for teaching and promoting healthy, sustainable lifestyles.

onto nature, daylight, and private rooms are the norm. These features promote energy savings, mental wellness, and greater acoustic privacy for better sleep.

The diagram below shows a single or potentially double occupancy room featuring a polished concrete radiant slab floor to promote thermal comfort and energy savings while reducing the building volume to save materials. The envelope is built to Passive House standards, providing optimal indoor air quality, acoustics,

and thermal comfort, while reducing campus energy consumption.

Operations Crucial for Well-being

Occupant health is not realized when the building is completed; rather, it involves ongoing engagement between the owner and tenants. Residence halls offer a major opportunity for campuses to promote health and wellness, teach sustainable and healthy lifestyles, and "walk the talk" of

continued to page 6

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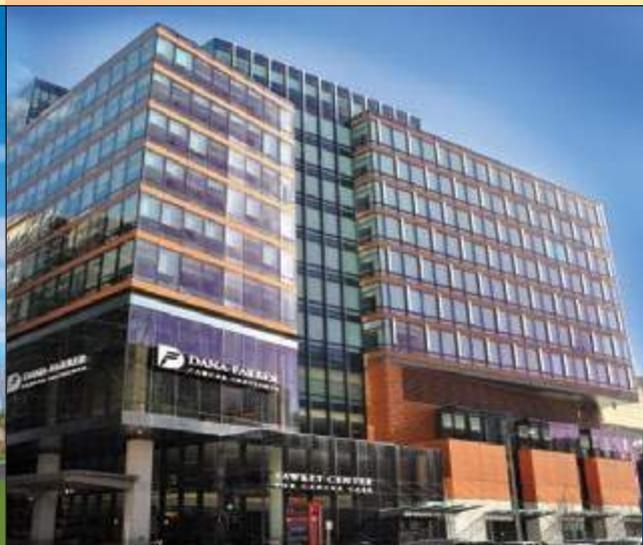
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Climate Change And The New Normal



by
Joseph A. Barra

Climate change is rapidly becoming a lightning rod of exposure for the design community. This article explores the impact this phenomenon is having upon the way engineers practice and the standards by which they are judged.

There are a variety of ways to describe climate change and its impact on the built environment. Whatever definition is used, the tension between existing design standards and professional practice presents a number of challenges for the 21st century engineer.

As rising sea levels continue to threaten our coastline, design professionals are developing innovative ways to manage these impacts. For example, at Clippership Wharf in East Boston, the developers replaced an existing concrete seawall with a shoreline comprised of tidal pools and salt marshes. These natural adaptive features function as a buffer that helps mitigate coastal flooding. To address the

rising average annual global temperature, designers are placing greater emphasis on passive strategies such as building orientation, fenestration, and the use of high-performance building materials.

The impact of nor'easters is no longer limited only to coastal concerns, as their effects are also felt inland with flooding rivers, streams and tidal wetlands. These storms have raised public safety concerns with regard to the siting and design of important infrastructure components. Astute designers are beginning to factor these concerns into their designs through the inclusion of oversized detention ponds, elevated first floors, and the relocation of mission-critical equipment out of a building's basement. Unfortunately, governmental codes and standards continue to lag behind such design initiatives. This disconnect leads to uncertainty in the design community as to how to define the professional standard of care without the benefit of homogeneity.

In the context of climate change, how do the various codes' failure to keep pace with an engineer's standard of practice affect a designer's legal exposure?

One variable in the malpractice equation involves the foreseeability of harm suffered by the injured party. When applied to a professional malpractice setting, this concept provides that an

injured claimant may not recover damages in a negligence claim against a design professional unless s/he can demonstrate that both the injured plaintiff and the harm were reasonably foreseeable.

...relying solely upon existing codes that only consider historical weather patterns is no longer sufficient. In the absence of exacting code guidance, today's engineer must independently consider the effects of sea level rise, flooding, heat, freezing conditions, excessive wind and the like when developing a conservative design.

A recent report published by the Conservation Law Foundation illustrates how the concept of foreseeability factors into a designer's exposure for failing to properly consider resiliency.^[1] Deanna Moran, one of the contributing authors, explains that design professionals may be liable for "failing to act reasonably in the face of ascertainable risk....Buildings and other physical assets are being designed and built based on climate patterns of

the past rather than those we see now or anticipate imminently."^[2] Given the notoriety of impacts surrounding the effects of climate change, a designer's ability to argue that neither the claimant nor his/her injury were reasonably foreseeable is becoming increasingly difficult.

The ability to precisely define a professional standard of practice to address the impacts of climate change will remain a challenge for the foreseeable future. We do know that relying solely upon existing codes that only consider historical weather patterns is no longer sufficient. In the absence of exacting code guidance, today's engineer must independently consider the effects of sea level rise, flooding, heat, freezing conditions, excessive wind and the like when developing a conservative design.

^[1]*Climate Adaptation and Liability: A Legal Primer and Workshop Summary Report; by the Conservation Law Foundation in collaboration with the Boston Green Ribbon Commission (January 2018)*

^[2]*Rising Seas Could Bring A Flood Of Lawsuits, by Deanna Moran; Banker & Tradesman (March 25, 2018)*

Joseph A. Barra, Esq. is a construction attorney in the Boston office of Robinson + Cole LLP.

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Reshaping Construction with Prefabrication



by
Melissa Sheffy

Construction Industry survey cited in the FWCI report, the top benefits realized by using off-site prefabrication are schedule advantage, high quality, cost-effectiveness, productivity, and reduced labor.

In our experience working on and completing 21 projects in Connecticut and Rhode Island, we can attest that the benefits are real and achievable.

Buildings constructed with off-site prefabrication methods go up faster and deliver higher quality to building owners. CFS provides for a tight envelope that enhances energy efficiency and cuts back on long-term maintenance. Assembled web joists, headers, and jamb studs provide high quality thermal and sound insulation. Light gauge steel is dimensionally stable and is not subject to moisture or mold concerns that plague wood stick-framed buildings, which is especially beneficial for healthcare and cleanroom environments.

In projects with occupied environments, off-site prefabrication can virtually eliminate noise and safety concerns. Because manufacturing, assembling and bundling prefabricated walls occur off-site, no chop saws or hot work permits are required, and installation of assembled panels can be completed quickly with minimal audible disruption while allowing for clean job sites.

Off-site prefabrication also requires sig-

nificantly fewer man-hours than conventional construction, which is especially significant in a tight labor market. Even big commercial projects such as distribution warehouse centers can be framed in CFS with a small crew of a single operator and a few trained installers.



NFS interior walls

Beyond all this, the impact that prefabrication can have on project schedules is nothing short of astounding. According to the FWCI report, schedules can be compressed by as much as 10:1 with prefabrication.

Here's why. In traditional construction methods, schedules are sequential. Prefabricated CFS is a design-led process where off-site fabrication and on-site construction can occur in parallel.

Working collaboratively with construction partners, we completed wall panels and roof trusses for a

four-story podium style dormitory in record time allowing the owner to meet an aggressive completion target. In another new construction project for a hospital, we were able to streamline processes and build in design efficiencies that will allow the building to be turned over a full two months ahead of schedule.

Despite these benefits, many owners and developers are reluctant to make the switch to CFS prefabrication. As a new construction method, it requires an entirely different way of thinking about project delivery.

Collaborative planning with subcontractors and fabricators should begin as early in the process as possible to apply lean construction principals, streamline supply chains and make the best use of technologies as a team. And while design-build projects are ideal for off-site construction, fully designed projects also can incorporate these methods with advance planning and early award of subcontractors to coordinate any conflicts well in advance of project start.

The bottom line is that off-site prefabrication is the future of construction. It is highly efficient, effective and sustainable and it is reshaping our industry. The conditions are right for owners to take advantage of new technologies to build better, faster, and maximize profits.

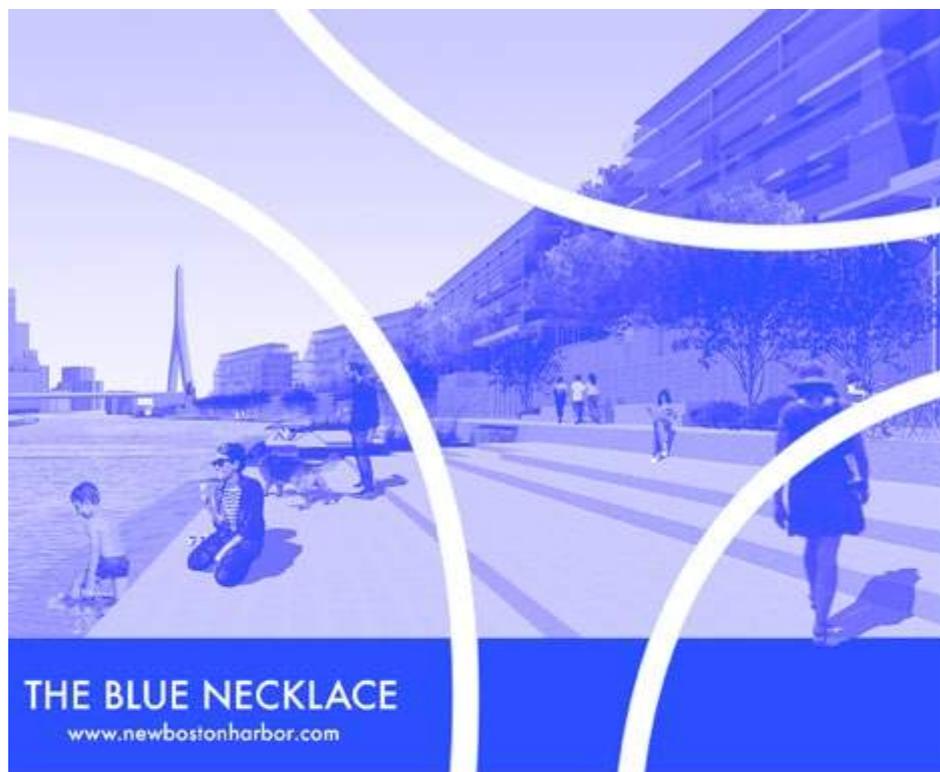
Melissa Sheffy is the owner of Network Framing Solutions and Network Interiors.

Off-site prefabrication is no longer an emerging trend. It has become the new normal in construction as more and more owners and developers realize the benefits of building with pre-engineered cold form steel (CFS).

This sea change is the result of several converging factors. According to a recent study by the Foundation of the Wall and Ceiling Industry (FWCI), prefabrication is growing rapidly due to the continued shortage of skilled labor, rapid advances in manufacturing technologies, and increased demand for sustainable solutions.

Over the last year, forward-thinking contractors like Network Framing Solutions saw the writing on the prefabricated wall. We shifted to become manufacturers of prefabrication systems ahead of the market. While the learning curve was steep, the benefits are well worth the climb.

According to a 2018 National Institute of Building Sciences Off-Site



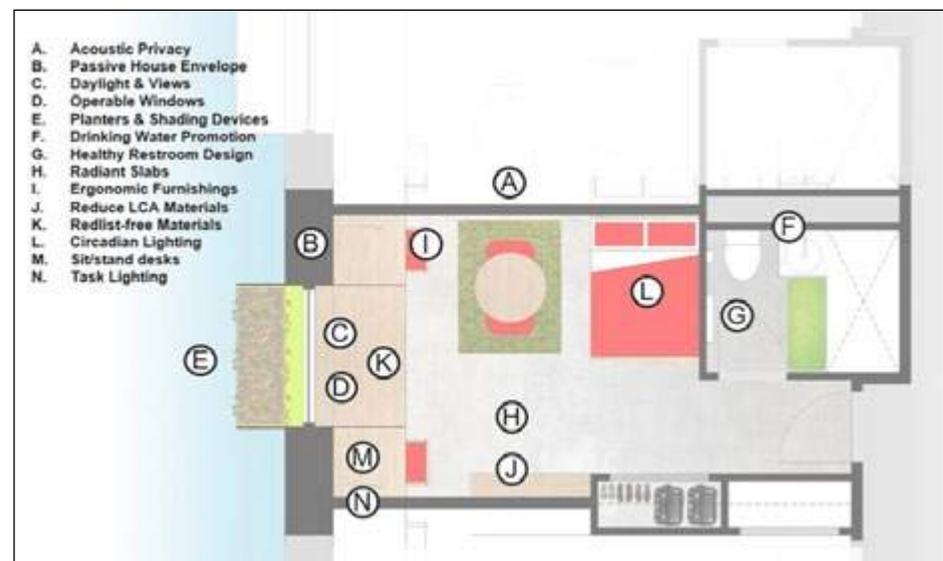
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Rethinking Residence Life to Promote a Healthier Campus continued from page 2



A plan of a typical single or double occupancy dwelling unit highlights opportunities to impact student health and wellness in personal quarters.

greenhouse gas emissions reductions.

Building performance monitoring, coupled with seasonal post-occupancy evaluations, becomes a learning opportunity that keeps students and staff accountable and engaged. Beyond physical buildings, policy is another instrument for promoting health and sustainability. A smoke-free campus, for example, is the best way to discourage the use of tobacco and e-cigarettes. And a green cleaning plan can promote

indoor air quality standards.

Residence Halls and Health

Colleges are no different than any other business in that they must stay relevant to remain successful. Students are more scrutinizing than ever about their dollars, time, and experience. There simply is no way to lose if campuses not only go green but go healthy too.

Blake Jackson is the sustainability design leader at Stantec.

It IS possible to be 'Off-Grid' in Snow Country!!



by
Caroline DiDomenico

When I tell people I'm off the grid in northern New England, I'm often met with a quizzical look; they usually think it means I've just turned off my cell phone and computer for the weekend. When they hear the real explanation, and then learn that I work for a major New England utility, it never ceases to get a laugh and more questions!

When we purchased land for a vacation home in Vermont about 15 years ago, my initial motivation for going "off-grid" was very simple: I had environmental concerns and a desire to use only what we needed. I wanted to use less overall energy and make as much as possible from renewable resources. After much research, it turns out going off-grid made economic sense too. There were no utilities near the property – the nearest neighbors with power are 1/8 of a mile away – and running power lines would have been obtrusive to both the landscape (and neighborly relations) and very costly. Solar became the renewable source of choice, as it was the most reliable and manageable.

Because of an awesome western view, the location and orientation for the house wasn't something negotiable, so the conventional approach of putting solar panels on a southern-facing roof wasn't an option for us. As we eventually found out – years later – that was a really fortunate problem to have, since solar



The western sky / All photos by Caroline DiDomenico

panels on roofs ended up not being the ideal solution in snowy Vermont.

Initially, we placed the original solar panels on a small wood shed with a southern exposure. This arrangement was able to accommodate six panels, enough to power our initial needs when used along with a back-up propane generator. When a pole barn was later added with another south-facing roof, we added six more panels, with the opportunity to increase it to 12. After a few winters, we understood why people can think off-grid solar doesn't work in snow country.

Being a vacation house, we weren't always there when it snowed, and in Vermont it can really snow. The panels on the wood shed could be easily cleared of snow with a soft brush while standing on the ground, but the new panels on the pole barn roof could only be accessed by climbing a ladder and using a very long (20') brush, not exactly my favorite chore when it's 10 degrees and blowing gale force winds. The real trouble came when we weren't there for an extended time; whatever snow that was left on the panels

would freeze at night into ice. FACT: there is no easy way to remove ice from solar panels, so don't try it! As a result, we learned some expensive lessons about what chronic inadequate charging can do to an off-grid battery bank.

When we decided to upgrade the whole power system for future full-time occupancy, we knew a ground mount system would always be easy to clear of snow and, if designed properly, might not even need clearing after most snowstorms. As the picture shows, the mount we built

fixes the panels at 45 degrees, which is optimal for both year-round solar production at our latitude and for shedding snow. The ground mount currently holds 24 panels (in two arrays) with room for 12 more later (as a third array). We can now clear the ground arrays in about ten minutes – when we rarely need to – and we never even bother clearing the pole barn anymore. In a recent upgrade, we also mounted three more panels on the side of the house so we can always provide some charge to the batteries, even in the worst extended storms (We learned that trick from an issue of Home Power magazine.).

The big lesson learned about solar off-grid in snow country? Until someone comes up with a snow removal system for panels, go with a ground mount system and make maintenance (and life) simple!

Caroline DiDomenico, LEED AP ID+C, GPRO O+M is a supervisor at Eversource Energy in the Real Estate and Facilities Management group. Eversource is a longtime member of the Construction Institute.



Taken when the sun was in the western sky

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Green Bonds: Financing the Path to Sustainability



by
Mike Eardley

What is a Green Bond?

A green bond is a type of bond that finances new or ongoing environmentally friendly projects aiming to combat climate change. These projects typically consist of projects aiming to improve the energy and sustainability of buildings and facilities, wastewater management, transportation, and other efforts to reduce negative effects on the environment. Green bonds have been sold in over 50 countries by federal and state entities, as well as public and private companies and investors. The U.S. is the leading source of green bond issuances, thanks to companies such as Fannie Mae and other government entities looking to improve overall sustainability efforts through infrastructure upgrades, transport improvements, retrofitting existing buildings to increase energy efficiency, and more.^[i]

What trends are we seeing?

Green bonds were first introduced in

2007 and gained traction in 2013 when billion dollar bonds were being sold within hours.^[ii] Since their emergence, we've seen rapid, steady growth and issuance is expected to hit the trillion dollar mark in the 2020s due to the impact of the European Commission (EU) Technical Expert Group (TEG). The EU TEG put out a Green Bond Standard (GBS) with new guidelines on corporate climate-related reporting. The guidelines provide companies with resources on how to support their climate-friendly efforts as well as how to report the impacts the initiatives will have on their businesses.

The GBS also recommended criteria for issuing green bonds to make sure they fall in line with acceptable green initiatives. Having a guideline for what makes a project 'green' helps investors determine how legitimate a project is and avoid falling for 'greenwashing,' or the act of making a project seem greener in an effort to entice investors.^[iii]

Green bond issuance is projected to max out between \$180-250bn by the end of 2019 and hit the \$100bn milestone in June 2019, far earlier than in previous years. In comparison, total green bond issuance in 2017 was \$155bn, hitting \$100bn in November, while in 2018,



the total issuance was \$163bn, hitting \$100bn in September.^[iv]

What are the benefits?

Green bonds are an effective way for issuers to raise money for new or existing environmentally friendly projects to meet green standards while simultaneously receiving lower interest rates. They are also a great place to invest money for multiple reasons: besides being ethically sound, the money spent on green bonds has the potential to be tax exempt or generate tax credits for the investor.

Looking to go green?

There are a number of ways to improve your company's carbon footprint:

- **Commissioning (Cx):** Commissioning for green building design ensures that an entire building or buildings, new or existing, are designed, constructed, and calibrated to operate as intended.
- **Retro-commissioning (RCx):** Retro-commissioning identifies problems or potential issues with a building's HVAC and other systems and produces engineering solutions to address these problems.
- **Energy Audits & Modeling:** This process provides energy reduction

strategies by auditing and/or improving energy management, energy generation systems, and renewable energy systems.

- **Green Property Condition Reports (GPCRs):** GPCRs provide detailed energy use analyses and utilize green recommendations to lower energy, water, and electricity usage, reduce operating costs, lower carbon footprints, and provide greater savings.
- **ENERGY STAR® Benchmarking:** EBI uses ENERGY STAR Portfolio Manager to measure, track, and audit energy and water consumption for new and existing buildings.^[v]

^[i]<https://www.bloomberg.com/news/articles/2019-03-24/what-are-green-bonds-and-how-green-is-green-quicktake>

^[ii]<https://www.climatebonds.net/market/explaining-green-bonds>

^[iii]https://earthecho.org/news/what_is_greenwashing

^[iv]<https://www.climatebonds.net/2019/06/green-issuance-surpasses-100-billion-mark-2019-first-time-milestone-reached-first-half-eu>

^[v]<https://www.energystar.gov/about>
Mike Eardley is the director of energy and sustainability at EBI Consulting.

CTGBC Honors 2019 Award Winners

New Haven, CT – On Oct. 3, the Connecticut Green Building Council (CTGBC) held its annual Green Building Awards at the Common Ground High School in New Haven.

John Mandyck, CEO of Urban Green Council in New York City, was a featured keynote speaker at the event.



This year's award winners are:

Atelier Ten Award of Excellence: Best In Show

The Slate School in North Haven, Conn.

Trailblazer Award

Sustainable CT in Willimantic, Conn.

Judy Swann Advocate Green Awards

Chris Schweitzer of New Haven Climate Movement in New Haven, Conn.

Residential Award of Honor

Hartford Habitat for Humanity in Hartford, Conn.

United Illuminating Residential Award of Merit

CT Contemporary Net Zero Home in Trumbull, Conn.

Institutional Award of Merit

UCONN Engineering & Science in Storrs, Conn.

Out-of-State Award of Honor

609 Main at Texas in Houston, Texas

Out-of-State Award of Merit

MGM Springfield in Springfield, Mass.

Site Award of Honor

Scofieldtown Park & Yard in Stamford, Conn.

Site Award of Merit

Island Habitat Landscape in Mason's Island, Conn.

Student Design Awards of Merit

Islamic Center of Greater Hartford in Hartford, Conn. and Archaeology Laboratory in Pompeii; Naples, Italy

Recognized for its leadership, Common Ground High School is one of the first environmentally-themed charter high schools and its farm is Connecticut's longest-running community farm.

Additionally, the Urban and Educational Center is a LEED Gold certified building and previous CTGBC Green Building Award of Honor winner.

Dan Diehl to Give Presentation

Newton, MA – Aircuity, creator of measurably better environments, announced that CEO Dan Diehl will be giving a presentation focused on the WELL Building Standard and Supporting the Core Research Mission at the 2019 SLCan Sustainable Laboratory Conference on Nov. 18-20 in Toronto.

Diehl will give the keynote presentation called "WELL Lab Building Adoption – Better Environments – Supporting Your Core Research Mission."

The presentation will include an overview of the WELL Building Standard, "a look at increasing productivity in labs through the environment, the economic benefits of turning your lab into a safety machine, and projects designed for WELL Certification."



Dan Diehl

SGA and Wheaton College Celebrate Pine Hall Ribbon Cutting

Students Celebrate First Eight Weeks Living in a Passive House Residence Hall

Norton, MA – Wheaton College hosted a ribbon cutting of the new Passive House (PHIUS) certified residence hall on Oct. 25 to celebrate this revolutionary design in sustainable student life.

SGA, a tech-forward architecture and interior design firm, has designed two such residence halls that opened for the fall 2019 semester as the first in Massachusetts to meet the extremely rigorous energy-efficiency standards of the Passive House Institute US. Williams and Wheaton Colleges now have feedback from students that have occupied these two buildings for two months and the feedback is very positive.



Exterior of Wheaton College's Pine Hall

“We have been thrilled to present Pine Hall as passive house construction. People are incredibly impressed by the efficiency that this building is designed to achieve. The new residence hall is a source of pride, not only for the residents who live there, but also the community as a whole,”

– ED BURNETTE –

“We have been thrilled to present Pine Hall as passive house construction. People are incredibly impressed by the efficiency that this building is designed to achieve. The new residence hall is a

source of pride, not only for the residents who live there, but also the community as a whole,” says Ed Burnette, associate dean for campus life, Wheaton College.

Passive building design implements “a set of design principles used to attain a quantifiable and rigorous level of energy efficiency within a specific comfort level.” Energy efficiency stems from continuous insulation throughout an airtight building envelope, high-performance windows, balanced heat- and moisture-recovery ventilation, management of solar gain, and elimination of thermal bridging. Certification with PHIUS ensures that

energy performance in reality aligns with energy modeling targets.

The benefits of these residence halls being designed to passive house standards are proving out both in terms of student health and wellness, and a 70% reduction in operating costs. Williams College has already established an energy monitoring program which will compare the actual versus modeled energy performance over the next 18-36 months, offering periodic feedback for the management and operations to fine tune the building performance. SGA is excited to publish these results.

“Through these projects, SGA has gained significant experience in applying PHIUS principles to two very different building types, and has developed a keen sensitivity to the pros and cons of each system,” says Jacob Higginbottom, director of higher education. “We owe our expertise in part to working with forward-thinking clients who are as committed to sustainability and energy performance as the Williams and Wheaton administrations are. We look forward to applying this experience to projects of other similarly advanced clients.”

“Our current student body and prospective applicants, along with their parents, are very concerned about climate change and actionable steps the college may be taking to address this threat. Pine Hall and its passive house certification represent the college’s commitment toward lowering our carbon footprint, investing for energy efficiency, integrating performance based system design and achieving

“Our current student body and prospective applicants, along with their parents, are very concerned about climate change and actionable steps the college may be taking to address this threat. Pine Hall and its passive house certification represent the college’s commitment toward lowering our carbon footprint, investing for energy efficiency, integrating performance based system design and achieving low impact development.”

– John Sullivan–

low impact development,” says John Sullivan, director of facilities, Wheaton College.

In addition to providing responsible design critical for global wellness, Higginbottom believes that sustainability initiatives are already playing a significant role in students’ criteria for college selection. He predicts: “As the competition for students increases, so will the adoption of PHIUS and other similarly aggressive carbon neutrality strategies, and SGA is positioned to implement them without significant additional capital investment. It’s an exciting time.”

Submitted by SGA.



Jacob Higginbottom speaks to attendees at the ribbon cutting for Pine Hall, Wheaton College’s newest residence hall. / Photo by Keith Nordstrom, Wheaton College

USGBC MA Announces 2019 Green Building Showcase Winners

Boston – The USGBC Massachusetts community works hard to advance sustainable and regenerative design, construction, and operation of the built environment. Once a year, they gather to celebrate industry success and innovation. Anastasia Barnes of HP recently attended this year's USGBC MA's annual Green Building Showcase (GBS '19).

The evening consisted of an open bar, catered food, lots of networking and an

awards celebration.

The awards were hosted by Jim Stanislaski of Gensler Architects, who was a part of a thematic sketch that included the "Net Zero Hero," played by Jim Newman of Linnean Solutions. Jill Pinsky of The Green Engineer and Lindsey Machamer of Pare Corporation were also part of the sketch.

Below are a list of the winning projects that were recognized at GBS '19.

Green Building of the Year

King Open/Cambridge Street Upper School & Community Complex

Submitted by Arrowstreet



PROJECT TEAM: William Rawn Associates, Architects; and Arrowstreet Architecture & Design

King Open/Cambridge Street Upper School & Community Complex sets a new standard for school design and high-performing buildings. Completed in August 2019, it is designed as the first net-zero emissions school in Massachusetts and was the pilot for Cambridge's Net Zero Action Plan, which defines net-zero emissions as an all-electric building with no on-site fossil fuel combustion and whose energy use is offset through renewables. The 270,000sf building includes an elementary school, middle school, school district administration, preschool, public library, public pool, and parking garage. The building was designed to push the envelope on net zero, occupant wellness, site impact, water use, and resilience.

Despite heavy daily and year-round building use, the project is designed to perform at an EUI of 25 using several

unique planning and user engagement strategies in addition to energy efficient systems. Building mechanical systems are ground-source heat pumps supplying radiant heating and cooling and displacement ventilation with demand control, providing improved thermal comfort and air quality. Other features include R-28 walls, R-40 roofs, daylight controls, LED lighting, and point-of-use hot water. Renewable energy is generated by roof, façade, and sunshade mounted PV and solar thermal hot water.

Water reduction is achieved through low-flow fixtures and rainwater capture reused for toilet flushing and irrigation. In addition to thermal comfort and air quality, wellness is supported through daylighting, healthy materials, biophilic design, and enhanced acoustics. The classroom finishes are Red List free.

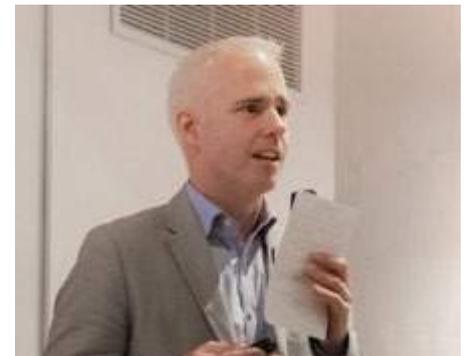
Site improvements include increasing infiltration by converting an acre of asphalt to vegetation. Resiliency features include an elevated first floor, cooling stations, and biodiesel generator.



Jim Newman and Lindsey Machamer performing the Net Zero Hero sketch / Photo by Billy Buckets



Attendees at the awards ceremony / Photo by Billy Buckets



Jim Stanislaski of Gensler Architects talks to the crowd / Photo by Billy Buckets

Market Leader – Energy and Water Efficiency

Arthur L. Irving Institute for Energy and Society

Submitted by Goody Clancy



Arthur L. Irving Institute for Energy and Society / Courtesy of Goody Clancy Architects

PROJECT TEAM: Architect: Goody Clancy; MEP/FP Engineer: van Zelm Engineers; Structural Engineer: LeMessurier; Civil Engineer: Engineering Ventures; Exterior Envelope: 3iVE; Sustainability: TransSolar; LEED: Steven Winter Associates; Landscape Architect: Michael Van Valkenburgh; Lighting: HLB Lighting Design; Acoustic/AV/Vibration: Acentech; Code: Jensen Hughes; Cost Estimator: Faithful + Gould

"The Irving Institute demonstrates the art and science of sustainable design. It is contextual, responding both to its place and interacting with the natural systems around it, resulting in resource conservation and promoting occupant wellbeing. The building breathes! What really made this project stand out is that the design addresses operational and embodied carbon, demonstrating the importance of each as we shift towards a carbon-free future."

– Judges Jennifer Preston, Greg Mella, and Shawn Hesse

Market Leader – Health/Wellness

Community Living Center – DCAMM Chelsea Soldiers’ Home

Submitted by Payette



Community Living Center – DCAMM Chelsea Soldiers’ Home / Courtesy of Payette

Project Team: Kevin B. Sullivan, FAIA (Principal-in-Charge), Wesley Schwartz, AIA (Project Architect), James Baer, AIA (Project Manager)

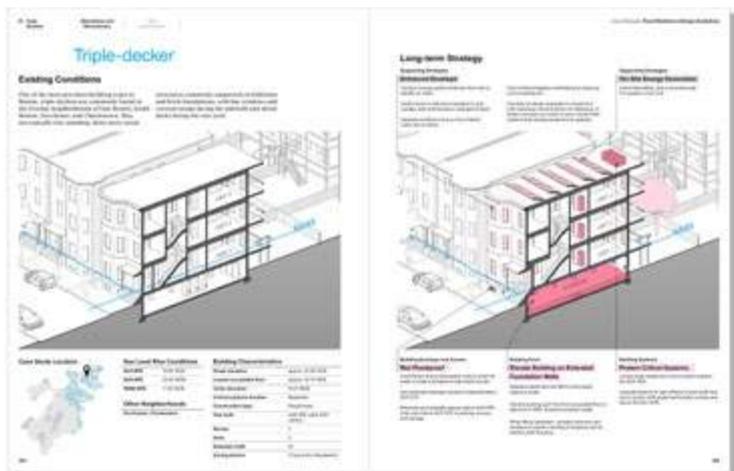
“The design of this facility, with excellent energy performance, natural ventilation, and connection to views and community spaces, is an exemplar of care for our veterans.”

– Judges Tristan Roberts, Bill Walsh, and Anne Hicks Harney

Market Leader – Resilience

Boston Coastal Flood Resilience Design Guidelines & Zoning Overlay District

Submitted by Utile



Boston Coastal Flood Resilience Design Guidelines & Zoning Overlay District / Courtesy of Utile and BPDA

Project Team: Utile, Inc.

“The site features a central courtyard which helps elevate the building access points above the FEMA floodplains and gently slopes down towards the waterfront using native plantings and rain gardens to help control the on-site storm water.”

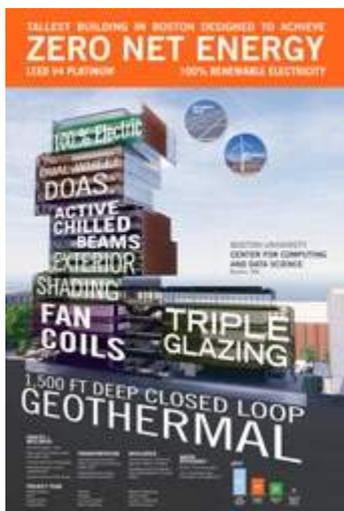
– Judges Betsy del Monte, Alex Wilson, and Greg Mella

Eversource / National Grid Energy Optimization Award

Boston University, Center for Computing and Data Science

Submitted by BR+A

Project Team: KPMB Architects, BR+A, Haley & Aldrich, Richard Burck, Dot Dash, Transsolar, The Green Engineer, Nitsch Engineering, Soberman Engineering, Jensen Hughes, Entuitive + LeMessurier, Suffolk Construction



Boston University, Center for Computing and Data Science / Courtesy of KPMB Architects and BR+A Consulting Engineers

Market Leader – Innovation and Peoples Choice Award

New Science Center – Amherst College

Submitted by Payette



New Science Center – Amherst College / Photo by Chuck Choi Photography

Project Team: Robert J. Schaeffner, FAIA, LEED AP (Principal-in-Charge), Sara Gewurz, AIA, LEED AP (Project Manager), Michael Hinchcliffe, AIA, LEED AP (Project Architect), Mark Oldham, AIA, LEED AP (Project Architect), Mary Gallagher, IIDA, LEED AP (Interior Designer)

“The New Science Center at Amherst College is the award winner for Innovation category due to the significant achievement in energy efficiency in a lab building, and the focused, creative approach to the thermal design of the building. Although sporting a significant glass wall, facing west, this wall is triple-paned thermally broken curtainwall system, is shielded by the more private west-reaching wings of the building, and it fronts the main circulation space which is impeccably designed for the support and access of the people and the control and use of airflow.”

– Judges Alex Wilson, Tristen Roberts, and Jodi Smits Anderson

Market Leader – Site

Xuhui Runway Park

Submitted by Sasaki



Xuhui Runway Park / Courtesy of Sasaki Associates

“The Xuhui Runway Park is the award winner for Sites category. It employs diverse green infrastructure approaches including pervious paving, inverted berms, ponds, subsurface storage, and robust plantings to reclaim an abandoned runway. They have created nature-rich and historically reverent haven in a dense metropolis by reusing materials in creative ways and maintaining the linear configuration of the space.”

– Judges Shawn Hesse, Betsy del Monte, and Jodi Smits Anderson

Honorable Mention – Innovation

Lumen at Beacon Park

Submitted by: Touloukian Touloukian Inc

CTGBC Names The Slate School Best In Show

New Haven, CT – On October 3, Patriquin Architects accepted the Connecticut Green Building Council’s 2019 Atelier Ten Award of Excellence, or “Best in Show,” for the Slate School in New Haven.

This award, along with others from the Connecticut Building Congress, CREW CT, and Engineering News Record New England, recognized Slate School as a project that sets a new paradigm for sustainable and collaborative school construction.

A private, independent, coeducational non-profit elementary school located on a biodiverse 25-acre site, Slate School provides a unique nature-based learning environment that aspires to cultivate creativity, kindness, and stewardship of the Earth while fostering a passion for learning and discovery.

When it came to designing a campus and buildings, it was critical to the owners that the school’s fundamental aspirations and principles were embodied in its design. Patriquin Architects, with a strong team of consultants, and construction manager, Gilbane Building Company, set out to redefine the standard for beautiful, healthy, energy-efficient school development in support of the school’s nature-based primary education.

With Milone & MacBroom as civil engineers and landscape architects,



Front entrance to Slate School / All photos by Ian Christmann

Patriquin Architects worked to minimize site disturbance and contribute to a series of productive ecosystems and educational landscapes. Slate School’s property was previously developed as a single-family residence with a series of outbuildings, and all new development is deliberately concentrated on those previously disturbed soils. The school’s small footprint allows the remainder of the site to become a nature conservancy and outdoor classroom.

A stormwater management plan improves downstream wetlands, while

landscape management practices remove invasive species, bolster native species, and create wetland enhancement areas. Many of the plantings on the site are productive, providing food for pollinators and other wildlife, and serve as important educational tools for the students.

The school’s design deliberately minimizes interior space while engaging the outdoors as an extension, and a vital part, of the classroom.

Slate School’s six buildings house four individual classrooms, a library, and a multi-purpose space. The buildings

are arranged around a central courtyard that is the focal point of the school, used extensively for learning activities. There are no interior hallways. Large windows and doors connect each classroom directly to the central courtyard, to gardens, playgrounds, and other open spaces.

Reducing the school’s ecological footprint through energy efficiency was another key goal of the project. Building envelopes are insulated and detailed to Passive House standards, with R-60 roofs, R-40 walls, R-30 floor slabs, and low air infiltration. Enhanced moisture

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PROUD TO PART OF THE CREATIVE TEAM FOR THE DESIGN OF THE INAUGURAL SLATE SCHOOL FACILITY

management includes rain screen siding and active vapor-open weather-resistant barriers.

High-efficiency mechanical systems burn no fossil fuels on campus, and include a “smart” energy-recovery ventilation system that constantly monitors indoor conditions and adjusts accordingly. Mechanical and structural systems are left visible, forming another part of the students’ education about ecological practices.

A key priority of the client was to create the healthiest classroom setting for teachers and students, requiring extensive material and product research throughout



View from the library out to the central courtyard

Additionally, great pains were taken to test and ban materials containing traces of lead or other toxic heavy metals, and all system components throughout the school are lead-free. This creates an environment that is uniquely safe for students and teachers, further helping set the standard for schools as beautiful and healthy spaces.

Gilbane Building Company was instrumental in leading the project team through logistically and technically complex construction. Eric Cushman, Gilbane’s project executive and operations manager for the project, notes some of the challenges and successes:

“Gilbane Building Company was honored to work with all of the team



Slate School sits within a biodiverse 25-acre site.



Classroom spaces feature broad views to the exterior

the design and construction periods. Although challenging, the project team succeeded in designing a building with no Red List materials, formaldehydes, VOCs, chemical flame retardants, and other allergens and irritants.



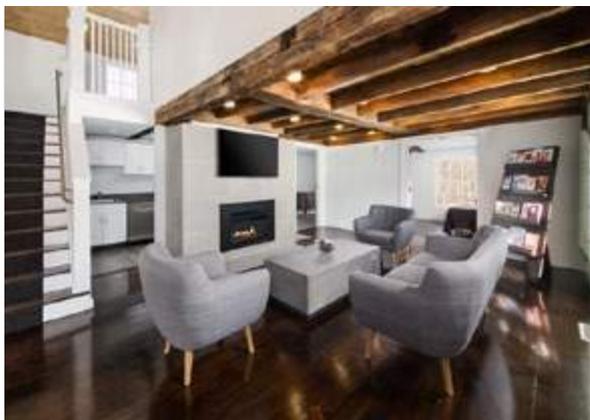
Classroom buildings surround a central courtyard, connected by exterior “hallways.”

members on one of the most remarkable independent K-6 schools in the country. From a building perspective, managing the quality of Slate School’s exceptional details, in addition to the demands of a

compressed construction schedule, are what make Slate School one of our most revered projects. The talent of the entire team is evident on this award-winning school campus.”

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Designing with Dignity: Holistic Design for the Human Spirit



by
Alana Spencer

Oftentimes, green building focuses on the environmental impact of a project, and does not always address health/wellness, climate resiliency, and social equity all together. And even more often, vulnerable population building design is rarely addressed.

Holistic design for vulnerable populations includes a community collaboration bringing together sustainable design, health and wellness, social equity, and climate resiliency design philosophies, methodology, and implementation into living spaces that empower human beings to have a feeling of respect, value and dignity.

Vulnerable populations include: Aging population (65+ years old), children (under age of 12), socioeconomically disadvantaged, minority groups, and those in need of short and/or long-term care.

Let's explore Health & Wellness, Climate Resiliency and Social Equity

measures that can be incorporated easily with Sustainable Design/Environmental Impact into design/build green buildings.

Integrative Process

First, the vehicle to unite all these measures with the design, construction and operational teams – Integrative Process. The Integrative Process brings together team members early (concept/schematic) to identify and analyze synergies among building strategies and components to increase the probability of sustainable design, health and wellness, climate resiliency, and social equity. Then continuing throughout each phase, teams continue to collaborate and interact for the achievement of the holistic design goals of the project.

Health and Wellness

The enhanced human experience focuses on health and wellness strategies for optimized interior conditions and healthy spaces. Measures to enhance health/wellness range from design features to program implementation. Lighting design has been proven to improve health and concentration (daylighting/glare-control, circadian, ambient and with the of ability to control lighting). Mental Restoration Design and Programs enhance occupant's cognitive functionality and mental outlook (restorative gardens, views to



Daylighting and biophilia design

flora/fauna, quiet spaces with acoustic comfort, mental health programs, olfactory comfort, healthy materials/products selection). Nutritional Support Programs improve longevity and in many cases, support recovery (accommodating for special diets, provide healthy cooking classes). Physical activity opportunities improve general health (Indoor/outdoor options, fitness center onsite or within close distance, yoga classes). Air and water quality measures reduce

back-up energy systems (fuel cells, battery storage), resilient landscaping (protective exterior landscaping design, soft permeable surfaces for water absorption, retention pond, bioswales, vegetated roof), and heat island reduction (highly reflective hardscape coating, shade trees, blue/cool roof).

Social Equity Impact

Universal design and accessibility increases the potential for developing a better experience for a wide range of individuals regardless of age, gender, socioeconomic status, etc. This includes encompassing a diverse design/construction team who will plan the project together, operational workforce and occupants. Equitable economic impact incorporates paying living wages to the design, construction and operational teams while in design plan to exceed local affordable housing requirements. Additional design considerations: design for pet ownership to encourage fitness and community interaction, optimize on location for public transit access and alternative means such as bicycle ridership, public space that promotes community within the surrounding area/neighborhood with seating and landscaping.

Financial Feasibility

Early within the Integrative Process, research local, state, and federal incentives for green buildings that include tax credits, design incentives, rebates and subsidies that can enable a highly impactful building, especially for vulnerable populations.

Holistic design for vulnerable populations can effortlessly bringing together sustainable design, health and wellness, social equity, and climate resiliency design philosophies, methodology, and implementation into living spaces that empower human beings to have a feeling of respect, value and dignity.

Alana Spencer, LEED AP BD+C, Fitwel Ambassador, is sustainability leader at Vanderweil Engineers.

Holistic design for vulnerable populations can effortlessly bringing together sustainable design, health and wellness, social equity, and climate resiliency design philosophies, methodology, and implementation into living spaces that empower human beings to have a feeling of respect, value and dignity.

containments inhaled and consumed by occupants (localized water filtration, air filtration media). Independence through controllability provides comfort and freedom to occupants (lighting, thermal comfort, safety wearables).

Climate Resiliency

Designing to climate region and proposed climate change is beneficial to enable the building to mitigate negative impacts on the environment, protect itself from major weather events and adapt to changing climate. Integration of passive strategies and climate-responsive design will reduce the building's energy loads, and optimize on the massing, orientation, envelope and address climate concerns. Design measures include: passive (orientation, super-insulation, optimized thermal mass) integrating onsite renewable power,



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