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SUSTAINABLE BUILDING & DESIGN



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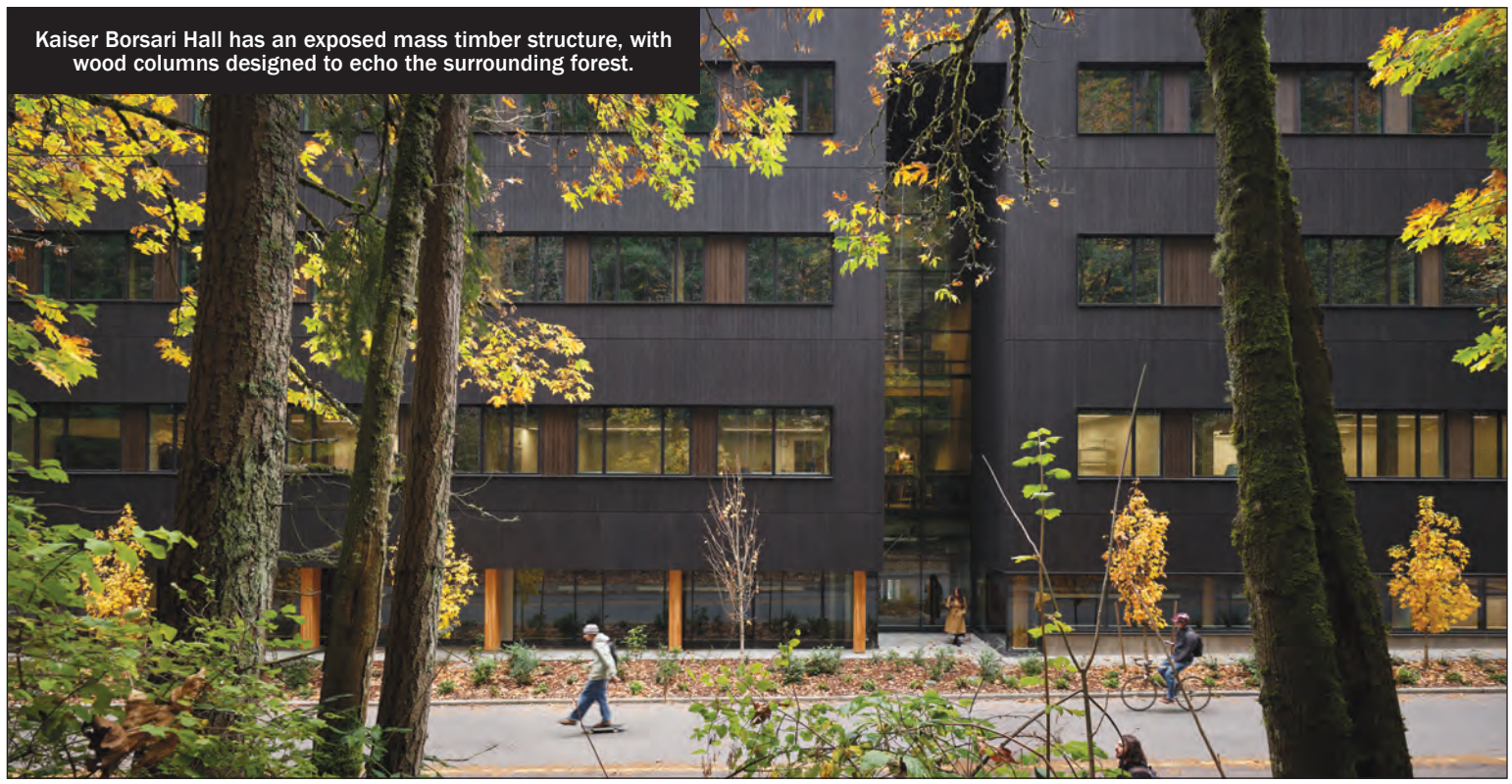
ONE BUILDING, A NEW STANDARD: HOW KAISER BORSARI HALL INFLUENCED A CAMPUS AND A STATE

Newly certified Zero Energy and Zero Carbon, Western's mass timber STEM building has already changed how the university and the state approach public construction.





BY RYAN BUSSARD & DEVIN KLEINER
PERKINS&WILL



Kaiser Borsari Hall has an exposed mass timber structure, with wood columns designed to echo the surrounding forest.

PHOTOS COPYRIGHT KEVIN SCOTT



Perkins&Will sought out ways to integrate the natural surroundings into the building's design.

Often, a building's success is measured by what happens within its walls. But the more lasting measure may be what happens beyond them.

Earlier this year, Western Washington University's (WWU) Kaiser Borsari Hall, designed by Perkins&Will, earned Zero Energy and Zero Carbon certifications from the International Living Future Institute (ILFI), among the industry's most rigorous sustainability credentials.

ILFI's process is unique — it requires measured performance over a full year, verified against the building's actual energy use and emissions, rather than relying on design models. For a 53,000-square-foot STEM building housing energy-intensive electrical engineering and computer science programs, reaching these two net-zero goals is no small feat.

While achieving this certification is the building's most recent accomplishment, it's only one piece of the story. Just two years after opening, Kaiser Borsari Hall has raised the benchmark for sustainability on WWU's campus and across Washington, and continues to provide valuable insights for future projects.

A BUILDING THAT CHANGED THE STANDARD

When the project began, buildings in Washington needed a minimum of LEED Silver certification to qualify for state funding. WWU leadership agreed to advocate for broadening that requirement to include Living Future certification, an initiative championed by Jason F. McLennan, Perkins&Will's chief sustainability officer and founder of the International Living Future Institute. Following the team's success, the state updated its criteria to accept ILFI's Zero Energy and Zero Carbon certifications as alternatives to LEED, thereby widening the performance-based path for statewide public projects.

The university went even further, choosing to adopt zero energy, zero carbon, and mass timber construction as goals for future projects across its entire campus. What began as one ambitious building now sets the bar for the next generation of buildings at WWU.

This ripple effect is aligned with the core mission of the Living Building Challenge. The framework is founded on the belief that buildings should give back more than they take, a principle that shaped this project from its earliest conversations.

In the following sections, we outline several concepts that inspired Kaiser Borsari Hall's design and ultimately



The university chose to adopt zero energy, zero carbon, and mass timber construction goals for future projects across its entire campus.

led to its certification.

STARTING WITH THE SPACE BETWEEN

Kaiser Borsari Hall stands on what was once a surface parking lot at the eastern edge of Western Washington's campus, where the university meets the Sehome Hill Arboretum. Edges like this are easy to overlook, as service zones and leftover land that belong to neither the campus core nor the forest beyond.

We saw it differently. Ecologists use the term "ecotone" to describe the transition zone between two ecosystems, often the most diverse places in a landscape. We applied that idea to the site, treating the seam between campus and the arboretum as an opportunity rather than a boundary. From the start, our design team intentionally thought beyond the property lines and project requirements, which ultimately helped strengthen connections to nature, improve building performance, and design a space that welcomes industry partners and the broader community alongside students and faculty.

BRINGING THE FOREST INDOORS

During early eco-charrettes, students and faculty told us how much they enjoyed the walking trails through the arboretum. Biophilia emerged as a core value for the university, and we took this directive literally, exploring ways to integrate the natural surroundings into the building's design. Drawing on the documented cognitive and physiological benefits of forest bathing, the Japanese practice of shinrin-yoku, we set out to carry the experience of a walk in the woods into the building itself.

Much of that exploration began with watercolor. Painting by hand lets ideas evolve before they harden into plans, and one image kept returning: the arboretum's trees continuing indoors as columns.

The result is an exposed mass timber structure, with wood columns that echo a forest. On the south facade, horizontal sunshades block unwanted solar heat gain while scattering dappled light throughout the interior, similar to the adjacent tree canopy. Framed views look back toward the arboretum. Here, performance and experience are intertwined — the elements that keep the building efficient are the same ones that make it feel alive.

ROOTED IN THE PACIFIC NORTHWEST

Rather than repeat the traditional brick and masonry seen across campus, we turned to the region's mass timber tradition for both structure and skin. The exterior accoya siding is finished in shou sugi ban, a traditional Japanese charring technique that preserves wood and reduces the need for chemical finishes. Its charcoal tone lets the building recede into the arboretum as a backdrop rather than a monument, while the interior reads as a warm wooden box for learning.

The numbers reflect the success of these material choices. The mass timber structure reduced embodied carbon by sixty-three percent, and the wood itself stores 466 tons of CO2e. Energy use runs 82% below a comparable baseline building, and solar panels cover three-quarters of the roof.

DESIGNING FOR EVERY MIND

For us, sustainability extends to the well-being of the people inside. Beyond biophilic features and healthy material choices, Kaiser Borsari Hall's layout is intentionally designed to support the sensory and spatial needs of neurodivergent students. The design offers sensory choice: lively collaboration zones sit alongside quiet nooks, so each person can find the setting that suits them.

We're now testing whether those choices work. Through a research partnership with WWU, funded by the Pedersen Foundation, we're conducting a technology-enhanced post-occupancy evaluation. Students, many of whom are neurodivergent, wear devices that track heart rate variability, blood pressure, and movement as they travel between Kaiser Borsari Hall and a connected neighboring building. Paired with surveys and interviews, that data will help us understand what makes a space restorative for some people and draining for others, and will shape how we design future buildings.

THE PATH FORWARD

Kaiser Borsari Hall shows what's possible when a dedicated project team pushes beyond established standards, design thinking, and precedent. For institutions weighing their next capital project, the lesson is that ambition compounds. Every building that demonstrates what can be achieved makes the next one easier to fund and build. An energy-hungry STEM building proved it could run entirely on renewable energy and account for its carbon; a university rewrote its expectations for future buildings; a state widened the path to funding.

Ryan Bussard is a design director in Perkins&Will's Seattle studio, where he led the design of Kaiser Borsari Hall. Devin Kleiner is a senior project architect and director of regenerative design in Perkins&Will's Seattle studio, where he leads sustainability strategy and is a member of the firm's research board.

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ON THE COVER

Seattle Public Schools has dedicated a full-time position to studying how exposed wood, like Alki Elementary's new light-filled commons shown here, affects student health and academics. Read more on pg. 6.

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BUILDING TACOMA'S MARITIME FUTURE

An integrated approach to cleanup and cultural resources led to the transformation of a Port of Tacoma brownfield site.



BY MARK LARSEN, REBECCA DESROSIERS AND AUSTIN JENKINS
ANCHOR QEA



Early investigation and cultural resource activities involving the Puyallup Tribe of Indians helped advance remediation and lay the groundwork for developing the new Maritime Center along Tacoma's Thea Foss Waterway and a section of the historical Puyallup River reach.

IMAGES FROM ANCHOR QEA

For decades, a stretch of waterfront on the east side of Tacoma's Thea Foss Waterway sat largely fallow, a remnant of the city's industrial past. The property once supported large wood-products operations, including plywood and door manufacturing. The waterway itself had undergone a Superfund cleanup, but contamination remained on the upland property.

The site also carries another, much older history: the area is culturally significant to the Puyallup Tribe of Indians.

Sitting between downtown Tacoma and the industrial Tideflats, the Port of Tacoma property presented an opportunity to realize the port's vision for a new Maritime Center. The campus includes a port administration building as well as a maritime skills center developed in partnership with Tacoma Public Schools for students in the South Sound.

The challenge was making the site ready for that future on a tight development schedule while being attentive to the environmental and cultural complexities. This required approaching remediation and cultural resources as integral components of design. The port and the project team established a baseline of environmental and cultural information and coordinated with the Puyallup Tribe to achieve a design that is sensitive to the cultural landscape.

UNDERSTANDING THE SITE BEFORE COMMITTING

Early work, supported in part by an Integrated Planning Grant from the Washington State Department of Ecology, included environmental testing and cultural resource investigations. These investigations found more extensive contamination than initially anticipated but also indicated that cleanup was feasible.

Cultural resources were another consequential factor. The site was historically part of an island situated between the North Fork and the South Fork of the Puyallup River. This island, within the heart of Puyallup homeland, holds deep spiritual significance to the Puyallup Tribe and is the site of highly sensitive resources and activities. Industrial development in the 19th and 20th centuries reshaped the waterfront, filling the original landform beneath layers of material, shrouding this deeper history.

Working directly with the Puyallup Tribe, the port and project team investigated these conditions and determined how to proceed while advising on design considerations to avoid the most culturally sensitive areas. Early intensive consultation and information gave the port enough confidence to move ahead with the site. The Port's elected commissioners and executive director consulted with Tribal leadership throughout the project's design and construction.

This helped establish an important principle that carried throughout the project: addressing environmental cleanup, cultural resources, permitting and redevelopment as interconnected parts of the same process.

CLEANUP, CONSTRUCTION SCHEDULES ON PARALLEL TRACKS

Conventional cleanups often proceed sequentially through investigation, regulatory review, evaluation of cleanup alternatives, design, procurement and construction. On a complex brownfield remediation, this process can consume years before redevelopment gets underway. Because funding and plans for opening the Maritime Center were already in place, the cleanup schedule needed to keep pace with the development schedule so the project vision could move forward.

To accomplish this, the port and its project partners instead used an accelerated approach that allowed remediation and development activities to move forward together. The primary cleanup activities took approximately six months, while other portions of the work were integrated into the development activities. This schedule was achievable by matching cleanup decisions to the future use of different portions of the property and working closely with regulatory agencies, the Puyallup Tribe and project stakeholders.

A thorough, integrated pre-construction investigation was critical to maintaining that pace. By defining both the extent of contamination and the pre-development native shoreline, the project team had the information needed to make timely cleanup decisions as work progressed.

The design-build delivery model was critical as well. Instead of completing cleanup design, procurement and construction before starting the development process, the team advanced the work concurrently and solved problems as they emerged.

For example, when excavation exposed undocumented remnants of old industrial foundations, some of the site's most contaminated soil was found in and around that concrete. Anchor QEA engineers, the port and the design-build team were able to resolve these conditions without disrupting the overall timetable. Some of the heavily impacted soil was treated prior to removal to detoxify it and reduce disposal costs.

Permitting presented another potential constraint. Waterfront cleanup and redevelopment projects frequently encounter delays as environmental cleanup approvals get delayed by unrelated aspects of the coming development. Here, the project team worked closely with regulators and city of Tacoma staff to develop a phased permitting approach that expedited the cleanup work and kept the overall project on track.

SUSTAINABILITY BEYOND THE BUILDING

For a sustainable building project, it can be tempting to begin the sustainability discussion at the building itself, including energy use, materials and operating performance. At the Maritime Center, sustainability began before the buildings came out of the ground.

Redeveloping an existing brownfield meant choosing challenging urban land in lieu of an easier greenfield site. The project team designed cleanup around actual future uses rather than simply maximizing excavation and disposal. Materials were beneficially reused within different parts of the project where appropriate. Shoreline soil remediation was coordinated with shoreline restoration activities.

Old creosote-treated docks, pilings, bulkheads and many tons of other industrial debris were removed from more than 1,000 feet of shoreline along the Foss and Wheeler-Osgood waterways, improving the shore-

line habitat and readying the area for public access along a new waterway esplanade that opens next spring.

BUILDING TRUST ALONG WITH THE PROJECT

There is another dimension beyond remediation that is harder to quantify: reconciliation. Proactively addressing cultural resource concerns through careful assessment, engagement and design helped shape the relationships necessary to move the project forward.

Although Anchor QEA and the port have a long history of working with the Puyallup Tribe, which played a key role in the cultural resource investigation and communication, the project's success is due to the approach to engagement.

The port and project team involved the Puyallup Tribe directly in the site investigation and provided updates on a regular basis, discussing what was learned, sharing open questions and uncertainty, and incorporating input. Tribal staff and representatives visited the site, and information was shared as work progressed. Cultural materials identified during site investigations were returned to the Tribe.



When environmental, regulatory and cultural challenges are understood early and addressed thoroughly through partnerships, redevelopment strategies can help guide transformation of complex industrial sites to places that support learning and the local economy.

Trust grew from a thorough, transparent approach to the work, and by demonstrating that commitments would be honored.

This same transparency extended to the broader community. The port and Tacoma Public Schools did not hide the site's industrial history, contamination or cultural-resource challenges. These were openly included in the public discussion surrounding the project and are visible in educational signage on site today.

The result was something that isn't common with brownfield redevelopment: broad community support.

Future phases envision additional shoreline improvements and a waterfront natural area developed in collaboration with the Puyallup Tribe that could help interpret the area's history and Tribal heritage.

In this way, the Maritime Center is doing more than putting an old industrial property back into productive use. It is also helping define what the transition between downtown Tacoma and its working waterfront can become: a place that acknowledges its environmental and cultural history while remaining connected to the maritime economy

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This year, Seattle Public Schools opened its fourth mass timber school, Alki Elementary in West Seattle.

PHOTOS BY BEN BENSCHNEIDER

BUILDING HEALTHIER SCHOOLS FROM THE INSIDE OUT

Mass timber offers an opportunity to rethink sustainability by considering not only a building's environmental footprint, but also its impact on the people inside.

In real estate, sustainability is often treated as an extra: design elements added on top of the baseline if the budget allows, and the first to be value engineered out when the cost estimate exceeds the budget.



BY ERICA SPIRITOS
MASSTAC

In Seattle, the baseline is already high. Our energy codes mean operational efficiency is baked into the design of every new building.

So why spend a constrained budget going above and beyond? Because sustainability isn't only about operational carbon. We are learning that the materials we build with, and the carbon embodied in them, also meaningfully affect the environment.

But materials matter in another way, too. There is a facet of sustainability that is less often prioritized and budgeted for: the impacts that our buildings have on the people inside them.

Taking a step back, we intuitively know that our surroundings impact our health. This is the underlying premise of forest bathing, which studies have associated with lower cortisol levels, heart rates and blood pressure. This research falls under the domain of environmental psychology, a field that studies how our physical surroundings (natural and built) affect behavior, emotion, cognition and wellbeing.

Extrapolating, it makes sense that just as our outdoor environment impacts our health, so do our interior environments. A related field, neuroarchitecture, focuses on brain and nervous system response to built space. Neuroarchitecture helps explain why soaring ceilings feel the way they do: a 2007 study found that higher ceilings were associated with more abstract, expansive thinking. It also helps explain Roger Ulrich's landmark 1984 finding that surgical patients with a view of trees had shorter hospital stays.

How often, when designing a building, do we think about what the building will do to us? As much as we think about what purpose it serves, or how it looks? And why does this matter?

According to the EPA, humans spend, on average, 90% of their time indoors. If the research on how our built environment impacts our biology, physiology, and psychology is true, then these spaces have tremendous potential to promote health, which is its own form of sustainability.

Most wellness features in buildings are additions: a living wall, upgraded finishes, a meditation room. Like other sustainability features, they sit on top of the baseline and are vulnerable when budgets tighten.

Mass timber offers a different proposition. In a mass timber building, the columns, beams and panels that serve as the structure, the bones of the building, can also be the surfaces people see, touch and live alongside every day. The structure itself becomes a natural material at room scale.

A growing body of research suggests that exposure to wood in indoor environments may have measurable effects on human well-being. A 2026 review by the Dutch firm ORGA architect, drawing on more than 100 studies, highlights several promising findings. In a University of British Columbia study, participants in offices with visible wood showed lower physiological stress responses. A Slovenian study found lower cortisol levels in rooms furnished with oak.

Researchers at the University of Padova found that people who took a break in a wood room performed better on attention tasks afterward, while those who rested in a non-wood room did not. That finding echoes Attention Restoration Theory, which suggests time in nature helps restore our ability to focus.

There are physical benefits to explore as well. Exposed wood absorbs and releases moisture, which can help moderate indoor humidity fluctuations and contribute to occupant comfort. A 2022 U.S. study found that mass timber walls reduced uncomfortable temperature hours by 31 to 46 percent compared with lightweight framing, thanks to the thermal mass of the wood.

The research is still young. Many studies are small and take place in labs rather than

occupied buildings, and most tested wood furniture and finishes rather than structure. The researchers are the first to call for larger, longer-term studies in real buildings. But the direction is encouraging, and the market is already responding.

Architects are increasingly turning to mass timber in part for its potential to create healthier, more restorative environments. Major institutions, from Microsoft to University of Washington, have chosen to build with timber partly with an eye to the talent they want to attract and retain. If we are making that investment for employees and graduate students, what are we doing for kids?

Washington is leading the nation in bringing mass timber to K-12 facilities. More than 25 of the state's 295 school districts have built a new facility with some amount of mass timber structure.

This year Seattle Public Schools opened its fourth mass timber school, Alki Elementary in West Seattle, and SPS has dedicated a full-time position to studying how exposed wood may be affecting student health and academic performance. That is exactly the kind of real-world, long-term research the field has called for, and Seattle is positioned to help provide it.

Children today are growing up surrounded by screens, and youth mental health struggles have reached concerning levels. Students spend more than 1,000 hours a year in school buildings. We owe it to them to ask not only what our schools cost and how they function, but what they do for the people inside them.



Washington is leading the nation in bringing mass timber to K-12 facilities. Shown here: Alki's new library.



Seattle Public Schools has dedicated a full-time position to studying how exposed wood affects student health and academics. Shown here: Alki's new commons.

A sustainable city is one that sustains its people too. When a building's bones can support both the planet and the children learning within them, health is no longer an extra. It becomes part of the structure.

Erica Spiritos is executive director of the Washington Mass Timber Accelerator (MASSTAC), a nonprofit advancing the adoption of mass timber in Washington, and previously helped establish Swinerton's mass-timber division, which became Timberlab.



WHEN SUSTAINABILITY BECOMES PART OF THE PASSENGER EXPERIENCE

The C Concourse Expansion pairs dynamic energy innovations alongside health and wellness measures for passengers and airport employees.





BY RICH WHEALAN & BRIAN COURT
MILLER HULL

At Seattle-Tacoma International Airport (SEA), the C Concourse Expansion (CCE) demonstrates how sustainability and the passenger experience can work together. Designed by The Miller Hull Partnership and Woods Bagot, the project integrates energy, carbon, water, and waste strategies alongside measures focused on passenger and staff health and wellness. And it does so within the highly constrained environment of an active airport, where security requirements, aircraft safety, and the demands of an operating airfield limit what a building can do.

As the first project at SEA to use the Port's Sustainable Evaluation Framework, CCE brought these priorities together from the outset. Guided by the concept "Bringing In, Seeing Out," the design restores connections to daylight, views, and the Pacific Northwest landscape, informing both the project's environmental strategies and the experience of moving through the concourse.

Rather than treating daylight, views, natural materials, and access to the outdoors as amenities layered onto a high-performance building, the design uses them as tools for both environmental performance and passenger comfort. The result is a building where sustainability is not separate from the passenger experience, but part of it.

DESIGNING WITH CHANGING DAYLIGHT

The CCE vertically expands and transforms the existing 81,000-square-foot concourse into a 229,500-square-foot, seven-story facility. With the building footprint already established, one of the primary design challenges was how to address the large southwest-facing opening created as the concourse grew upward.

Southwest exposures present a common problem: direct sun can bring unwanted heat gain and glare, particularly as the sun moves lower in the sky toward the west. Conventional solutions fall short in an airport environment. Reflective glass is a safety concern for aircraft and air traffic control, and a fixed tint limits daylight on Seattle's cloud-rich days, reducing the transparency and passengers' visual connection to the exterior.

The solution combines electrochromic glazing technology with a folded facade inspired by the filtered daylight found in the forests of the Pacific Northwest.

The facade breaks the southwest-facing opening into alternating south-facing and west-facing vertical glass panels, creating pleats along the entire facade. Electrochromic glass dynamically changes its tint in response to the path and intensity of the sun. During the morning and early afternoon, the south-facing glass tints while the west-facing glass remains clear. Later in the day, as the sun moves west, the south-facing glass clears and the west-facing glass tints.

This dynamic response reduces heat gain and glare when direct sunlight is strongest, limiting the need for mechanical cooling. For passengers, the result is a calmer, more comfortable space. On cloudy days, the glass can remain untinted, allowing natural light to fill the three-story atrium, reducing the need for artificial lighting while preserving views to the airfield and Olympic Mountain Range.

The same system that improves energy performance also changes what passengers see and feel throughout the day. The facade becomes an indicator of the conditions outside, rather than a static barrier between the concourse and its surroundings.



The Lookout at C and rooftop photovoltaic array connect sustainability with access to the outdoors.

PHOTOS BY EMA PETER

MAKING ROOM FOR COMFORT

At the center of the CCE is a more than 10,000-square-foot marketplace inspired by Seattle's public markets and civic gathering spaces. Passenger circulation intentionally passes through the marketplace, alongside dining and retail, the Grand Stair at C, and a space for informal performances.

The scale of the atrium could have made it feel imposing, but a variety of seating areas and smaller spaces give passengers opportunities to engage with the activity or withdraw from it. The Western Hemlock wood ceiling and Tree at C help unify the three-story space while introducing natural materials and patterns. Together, these elements support the project's biophilic design strategies, while the wood ceiling pro-

vides acoustic treatment that helps create a calmer environment within the busy airport.

The Lookout at C, the first public outdoor airside space in the airport's history, extends the concourse's connection to the outdoors. Enclosed by laminated security glass with narrow vertical gaps for air movement, the space allows passengers and staff to step outside while remaining within the secure airport environment.

The design team found early in the process that the Lookout resonated with a wide range of stakeholders, including airport operations and administration staff. In a location where access to fresh air and open space is limited, that response underscored the value of creating opportunities to engage with the outdoors.

The space is designed around views of the airfield and Olympic Range, with rugged, sustainably harvested Ipe wood decking and locally sourced basalt seating stones. A low-E coating within the security glass helps reduce heat gain during the summer, while concealed exhaust provides additional ventilation. At night, low-level lighting maintains safety without competing with views.

INVISIBLE STRATEGIES

Some sustainable design strategies improve the experience simply because the passengers don't have to think about them.

CCE uses heat recovery from ventilation return air and restroom exhaust air, along with air-source heat pumps for heating and cooling. The building is all-electric, allowing it to operate separately from SEA's Central Plant, while tenant cooking equipment and hot water systems are also electric. Low-flow plumbing fixtures reduce water use, and construction waste was source-separated for diversion from landfill, with off-site prefabrication and just-in-time delivery helping address the logistical challenges of building on an active airside site.

It's not uncommon for these systems to go unnoticed by building occupants, and it could be argued that sustainable design strategies are successful when they are integrated into the building so seamlessly that occupants simply experience the benefits.

Other strategies are intentionally more visible. A 500-kilowatt photovoltaic array occupies the roof, producing approximately 12% of the project's annual energy. The array also provides a visual clue to the building's all-electric approach. Largely concealed from passengers inside the concourse, it becomes a recognizable feature when viewed from an airplane during takeoff and landing.

CONNECTING PERFORMANCE AND EXPERIENCE

With more than 50 million passengers a year, SEA is a highly constrained public space serving an enormous number of people. CCE shows that those constraints don't have to come at the expense of the people moving through the building.

Passengers may never know that the facade glass reduces cooling loads, or that heat recovery lowers the building's energy use. What they experience is a concourse filled with daylight, free of harsh glare, open to the outdoors, and rooted in the Pacific Northwest.

Rich Whealan is a principal at The Miller Hull Partnership. Brian Court is a partner at The Miller Hull Partnership.



Electrochromic glazing at the folded facade responds to changing sunlight, balancing glare and heat gain with daylight and views.



Passenger circulation moves through the marketplace, where the Tree at C and Western Hemlock ceiling bring natural forms and materials into the three-story space.

MERCER MIDDLE SCHOOL LINKS MASS TIMBER AND HIGH-PERFORMANCE DESIGN

The mass-timber school combines low-carbon construction, high-performance systems, and ecological restoration to reconnect students, the community, and the landscape.

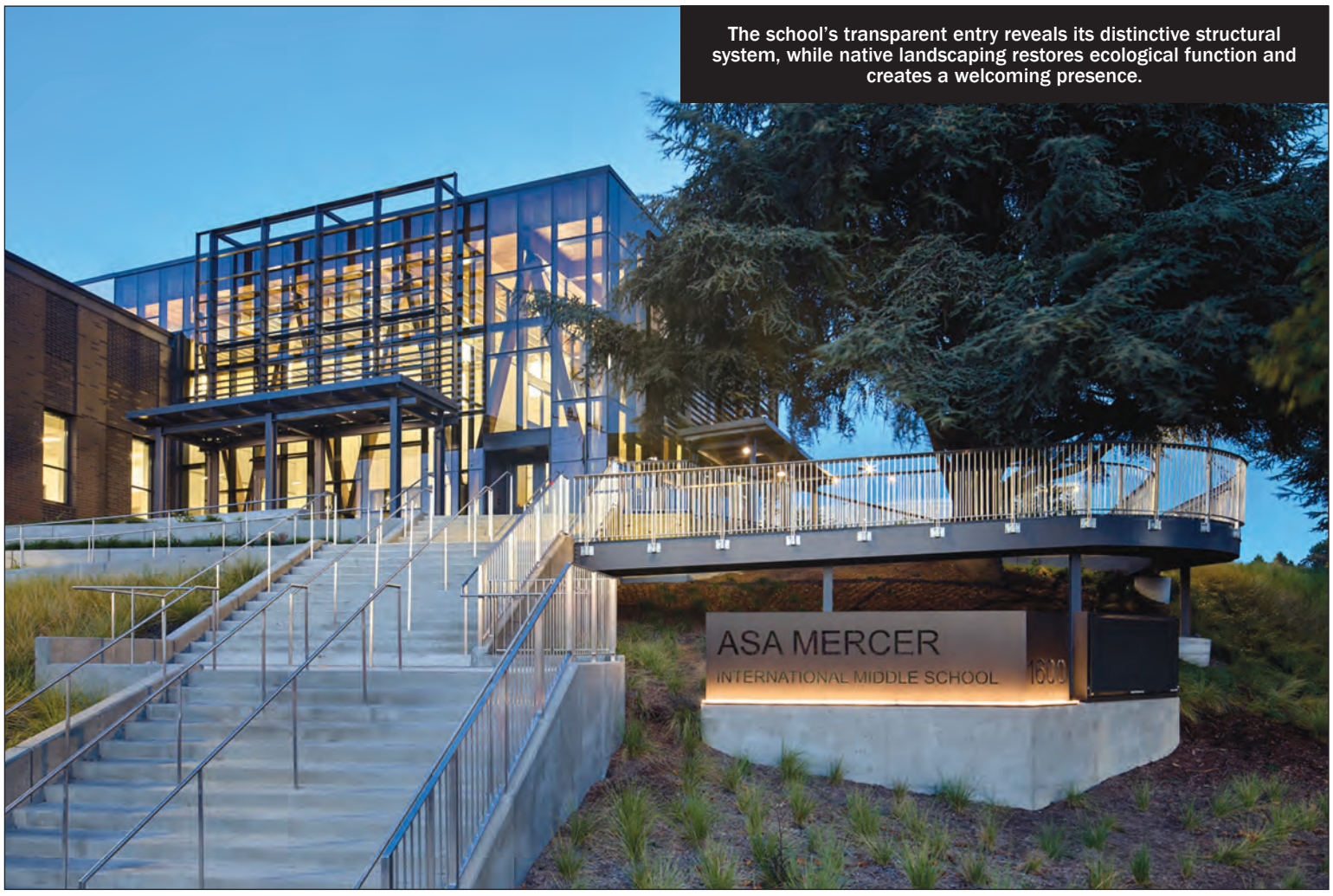


BY MICHAEL DAVIS
BASSETTI ARCHITECTS

At the southwest edge of Jefferson Park in Seattle's Beacon Hill neighborhood, Mercer International Middle School brings mass timber construction, ground source heat exchange wells, and native landscaping together on a compact campus.

Designed by Bassetti Architects, a Design Studio of HMC Architects, the new 180,000-square-foot replacement public school accommodates approximately 1,000 students in a three-story building. Consolidating the aging, fragmented campus created room for native planting and outdoor learning alongside the new school.

Rather than treating sustainability as a collection of technologies, the project brings structure, energy, ecology, and wellbeing together. The result is a school where environmental responsibility is visible in the architecture, and experienced throughout everyday student life.



The school's transparent entry reveals its distinctive structural system, while native landscaping restores ecological function and creates a welcoming presence.

PHOTOS BY LAWRENCE ANDERSON STUDIO

RESTORING THE LIVING LANDSCAPE

Long before Beacon Hill became one of Seattle's most culturally diverse neighborhoods, the area was a forested ridgeline stewarded by the Duwamish people. The Lushootseed name for Beacon Hill, qWátSéécH, translates to "Greenish-Yellow Spine," recalling the deciduous trees that once characterized its hillsides.

As Seattle expanded, regrading, industrial development, and urban growth transformed the landscape. Beacon Hill also became an important center for Seattle's growing and increasingly diverse communities, developing a rich history of inclusion, cultural exchange and belonging.

The Mercer campus evolved alongside the neighborhood. Over time, the forested landscape gave way to a developed school site dominated by buildings and paved surfaces.

The replacement project offered an opportunity to reverse that trajectory.

By consolidating academic and community programs within a compact footprint, the design returns more of the site to native landscape, habitat, and outdoor learning. Native planting supports biodiversity while rain gardens and other landscape-based strategies manage stormwater onsite.

The restored landscape also becomes an educational resource. Views to greenery, outdoor learning spaces, and direct relationships between interior and exterior environments bring students closer to the natural systems that have shaped Beacon Hill for generations.

MASS TIMBER REDUCES CARBON, SHAPES LEARNING SPACES

At the heart of Mercer is a central mass timber spine composed of glulam framing and cross-laminated timber (CLT). Repeating angled timber frames connect classrooms, shared commons, student resources, and outdoor environments.

The structure is both an environmental strategy and the school's defining architectural feature.

A whole-building life cycle assessment informed material decisions, resulting in an estimated embodied carbon intensity of 20.8 kilograms of carbon dioxide equivalent per square foot — approximately 62 percent below the project's benchmark of 53.6 kilograms per square foot. The assessment covers material production, transportation to the site, and construction, identified as stages A1–A5.

Exposed wood makes the structure visible throughout the building and reduces the need for additional finishes. The timber provides a natural material palette while reducing reliance on more carbon-intensive structural materials.

Its architectural role extends beyond material efficiency. The central spine expands into shared commons, collaboration areas, integrated seating, and a generous learning stair, transforming circulation into an active part of school life.

This dual purpose illustrates Mercer's integrated design philosophy: the same structural system that reduces embodied carbon also establishes identity, supports wellbeing, and creates opportunities for students to gather and learn.

HIGH PERFORMANCE FROM THE GROUND UP

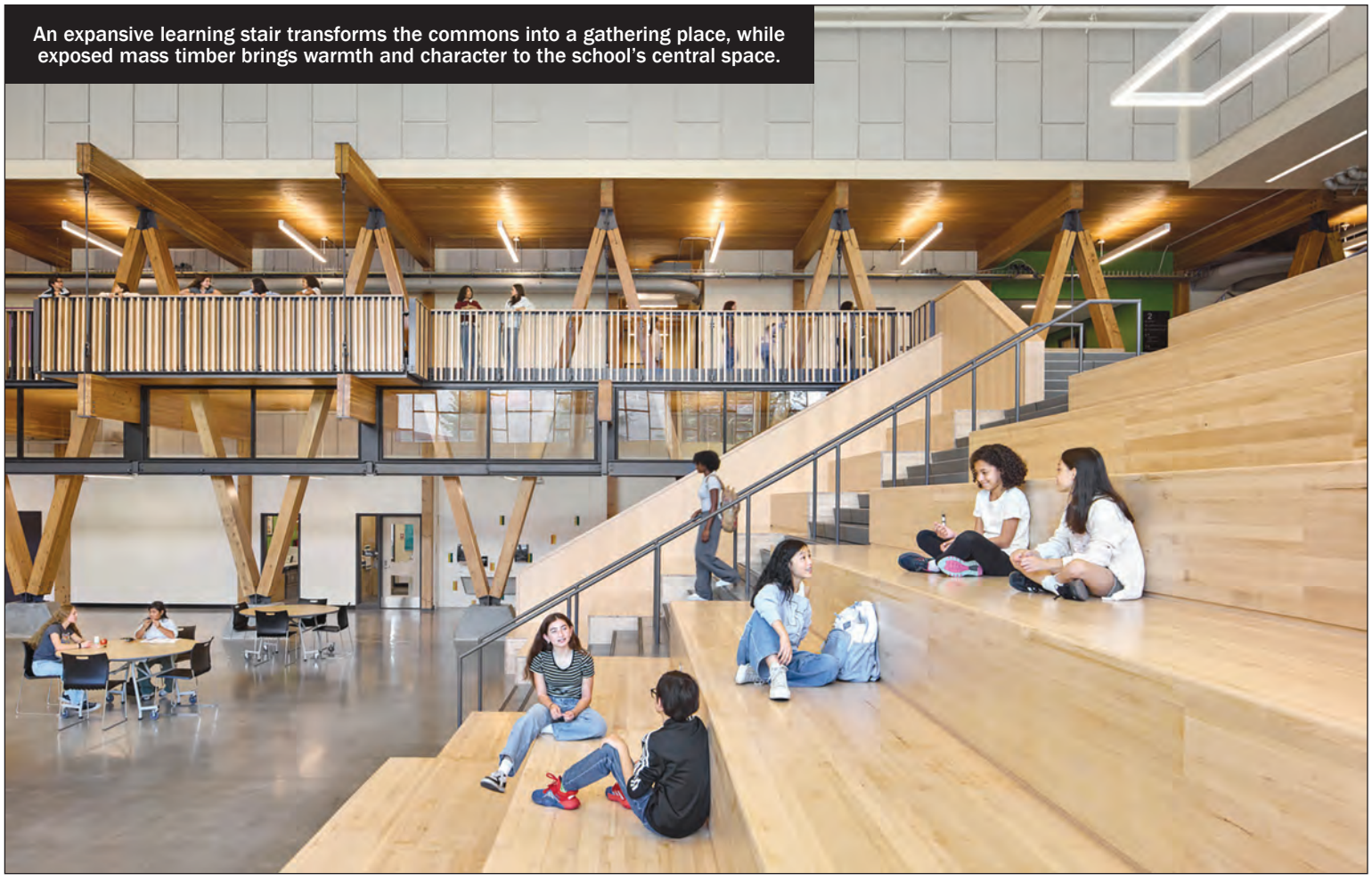
The all-electric school combines passive design, a high-performance building envelope, onsite photovoltaics, and an extensive ground source heat-exchange system. Beneath the campus, 215 wells extend to depths of approximately 350 feet, supporting efficient heating and cooling year-round.

Energy modeling predicts a net energy use intensity (EUI) of 16.15 kBtu per square foot annually, approximately 78.5% below the project's benchmark of 75. The all-electric design eliminates onsite fossil-fuel combustion for building operations, and is projected to reduce operational emissions and energy costs.

Water conservation complements these strategies. Efficient plumbing fixtures

contribute to a predicted water use intensity of 5.9 gallons per square foot annually, approximately 46 percent below baseline. Onsite stormwater management further supports the campus's ecological performance.

Daylighting, structural design, mechanical systems, and landscape were considered together, allowing environmental performance to influence the building's form and occupants' experience.



An expansive learning stair transforms the commons into a gathering place, while exposed mass timber brings warmth and character to the school's central space.

SUSTAINABILITY THAT SERVES STUDENTS AND COMMUNITY

Mercer's sustainability story extends beyond energy and materials to the health and wellbeing of the people who use the building.

Trauma-informed design principles influenced the organization of learning environments. Daylight, natural materials, intuitive wayfinding, and visual transparency create a welcoming atmosphere, while flexible classrooms and shared spaces provide opportunities for collaboration, independent study, and quiet retreat.

Community amenities extend the school's role beyond instruction.

A transparent, light-filled entry welcomes Beacon Hill residents. Community-facing amenities include a health clinic, family resource center, community kitchen and gathering spaces.

Cultural stewardship is woven into the experience as well. Interpretive exhibits developed in partnership with the Washington State Department of Archaeology and Historic Preservation share the neighborhood's layered ecological and cultural history. Seatbacks salvaged from the original school have been repurposed into a permanent art installation, preserving a tangible connection to Mercer's past.

The community amenities and connections to local history complement the project's environmental strategies, broadening the campus' role as a public resource.

A RESTORATIVE APPROACH TO SCHOOL DESIGN

Mercer International Middle School links environmental performance with the spaces students and neighbors use each day. Its compact footprint creates room for native planting and outdoor learning, while the mass timber spine combines structural functions with places to gather. Ground source heat exchange wells support efficient heating and cooling, and on-site photovoltaics generate electricity.

The project illustrates how coordinating site planning, structure, and building systems can support educational and community uses on a single campus.

Michael Davis is a principal at Bassetti Architects, a Design Studio of HMC Architects, bringing expertise in sustainable design and high-performance educational environments.



Timber columns rise alongside expansive windows overlooking the restored landscape, bringing daylight and nature in while making low-carbon structural systems visible.

TAKING A COMPREHENSIVE VIEW ON SUSTAINABLE BUILDING ENHANCES OUR LIVES

How designers can harness the principles of true sustainability to create denser, more connected neighborhoods that that make people happier.



Northlake Commons is a majority mass timber commercial building that opened across from Lake Union in 2024.

PHOTO BY ZION THOMAS



BY JAMES M. BOUREY
SEATTLE ARCHITECTURE FOUNDATION

Sustainable building means many different things to people depending on their perspective and particular interest. Some may be focused on the energy consumption of buildings, others may be more interested in the materials used, and yet others could be more interested in mixed-use to reduce greenhouses gases generated by automobile travel.

For an inclusive and comprehensive view of sustainable building, one must examine the fundamental questions of what, where and how. That is, **what** is built, **where** buildings are located and **how** the structures are designed. All three have a major impact on the degree of sustainability of our built environment.

Where is especially critical for the consumption of energy. A pattern of low-density single-family residential built at a distance from employment centers consumes tremendous amounts of energy for transportation.

What is also vitally important. For instance, building predominately single-use structures increases the need for people to travel from place to place. Finally, the **how** tells us about the consumption of renewable or nonrenewable resources as well as the energy consumption of a building's operation.

For many years, people have recognized that the pattern of sprawling residential development, spreading well beyond central employment in downtowns or manufacturing or office concentrations, consumes tremendous amounts of energy for transportation and produces great amounts of greenhouse gases. Reversing this highly consumptive pattern requires not only locating residential areas closer to employment centers but also increasing densities, which bring more people closer to their desired destinations.

Even more energy can be conserved if uses are mixed, and people can be closer not only to where they work but also to where they shop, go to school, and do other essential activities. This would also conserve the amount of land that is consumed by development. Notwithstanding those who would have us inhabit the moon or other planets; there is indeed a limited amount of land on Earth.

Much has been studied and written about the sustainability gains that can and indeed have been made in the use of materials in buildings. The use of renewable materials has made great strides. The growing use of mass timber construction is just one notable example.

Beyond the use of materials that are renewable (a supply can be continuously produced), sustainability must consider what happens to the materials that go into a building after it has outlived its usefulness — at least in the eyes of those that want to build something else. Incorporating materials that can be reused or recycled will create a much more sustainable future. The concept of considering the life cycle of the materials in the products we produce was so eloquently presented in a terrific book, Cradle to Cradle by William McDonough and Michael Braungart.

Another important consideration that has gained significant traction in the past few decades is energy consumption in buildings. Throughout history, before mechanical air conditioning, building designs responded to the climate through the use of materials and building orientation, among other ways to naturally keep buildings cooler in the summer and warmer in the winter. We have had to relearn those techniques while also learning how to reduce energy consumption through technological advancement like solar energy cells.

Does this lead us to an escapable question? If we follow these directions for sustainable building, we will create an environment that is acceptable but embraced

by people. I would argue that these principles can be followed and still lead to a built environment with a truly high quality of life and, in fact, one that will enrich people's lives.

Researchers and urban planners have long examined the social isolation associated with low-density suburbs. Many believe that increasing human interaction leads to more fulfilling lives. The vibrancy and connectedness of denser living patterns can be a counter to that social isolation.

Some may see using an automobile to travel anywhere one wants as freedom. However, it is hardly freedom to be stuck in an endless gridlock. Alternatively, many embrace the idea that public transit takes you where you want to and frees you from dependence on the automobile. There is the added benefit of reduced commuting times, which frees up time for more productive and enjoyable activities.

When the densities and mixture of uses can help bring people together it makes walking and bicycle riding a viable alternative. This has an added health benefit. It also makes transit services more feasible, fur-

SUSTAINABLE – PAGE 19

Relatively dense Seattle residential development, designed to accommodate families.



PHOTO BY JAMES BOUREY

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BUILDING SUSTAINABILITY FROM THE INSIDE OUT

An integrated approach to development and construction can reduce environmental impacts while creating healthier, more productive places for the people who build, occupy and experience them.





BY STEWART GERMAIN & ROB ROBINSON
SKANSKA

For years, sustainable building has largely been measured by what happens after construction is complete and buildings are delivered to market: energy consumption, water efficiency, carbon emissions, and environmental certifications. These measures remain essential, but they tell only part of the sustainability story.

A more comprehensive approach considers sustainability throughout a building's lifecycle, from early development decisions and material selection to construction methods, tenant well-being and, more broadly, the project's impacts on the surrounding community.

The greatest opportunities emerge when project owners, developers, designers and builders collaborate from the outset, bringing their respective expertise to decisions that influence both environmental performance and the human experience.

At Skanska, our work across commercial development, healthcare, education and other market sectors reinforces an important lesson: Sustainability is not simply about creating better-performing buildings. It's about creating better outcomes for the people who build and use them.

That philosophy also informs Skanska's broader environmental commitments, including its ambition to achieve net-zero carbon emissions across its operations and value chain by 2045.

INTEGRATING SUSTAINABILITY FROM THE START

Project owners, developers and construction teams often approach sustainability through different lenses. Owners and developers consider long-term building performance, occupant expectations and investment value, while builders focus on materials, construction efficiency, safety, waste reduction and project delivery.

These priorities are closely connected, and early collaboration among owners, developers, designers and builders can identify opportunities to reduce embodied carbon, incorporate prefabricated building components, improve construction sequencing, increase safety and minimize disruption to surrounding neighborhoods. Those same decisions can influence the quality, flexibility and long-term performance of the finished building.

In our experience, some of the most consequential sustainability decisions happen long before construction begins. When development and construction teams work together early, we can challenge conventional approaches, identify opportunities to reduce environmental impacts and create buildings that better serve the people who use them.

Mass timber offers a compelling example. Beyond its potential to reduce embodied carbon compared with conventional structural systems, prefabricated timber components can improve construction efficiency by shifting some work from active job sites to controlled manufacturing environments. This can reduce on-site activity, streamline schedules and minimize material waste while creating opportunities to improve worker safety and construction predictability. Skanska's experience across 31 completed mass-timber projects totaling more than 2.4 million square feet continues to inform its approach to design coordination, prefabrication and construction delivery.

Beyond construction, exposed wood, natural light and other biophilic design elements can help create more welcoming environments that support occupant comfort and well-being — particularly important in workplaces, schools and healthcare facilities.

BEVEL: CONNECTING ENVIRONMENTAL, HUMAN PERFORMANCE

These principles are informing Bevel, a planned 12-story mass-timber office tower in downtown Bellevue that brings together Skanska's development and construction teams from the earliest planning stages. Designed by Mithun + Waugh Thistleton, the approximately 200,000-rentable-square-foot Class A building draws on expertise in commercial development, sustainable construction, architecture and engineered timber.



Skanska is developing and building Bevel on Bellevue's Washington Square block, targeting LEED v4 Platinum for the mass timber building.

RENDERING BY PLOMP

Bevel's planned structural system combines mass timber above grade with a steel core and below-grade concrete structure. The building is targeting LEED v4 Platinum, Fitwel 2-Star and Salmon-Safe certifications. Early schematic design analysis indicated that Bevel's proposed hybrid structural system could reduce embodied carbon by approximately 49% compared with a typical concrete building of the same size.

Bevel also demonstrates how early collaboration can translate into measurable environmental and economic benefits. Although Bevel falls below the height threshold that would otherwise trigger the requirement, the team voluntarily applied performance-based design to take advantage of the building's lighter mass-timber structure. This approach is intended to reduce the total amount of steel required, thereby reducing both the project construction cost and embodied carbon impact.

Sustainable construction isn't always about adding more features to a building. Sometimes the greatest opportunities come from challenging conventional approaches and finding smarter ways to use fewer resources.

Skanska's sustainability ambitions extend beyond Bevel's structural materials and certifications. The all-electric design eliminates on-site reliance on natural gas, while integrated stormwater management and water-reuse strategies are intended to reduce the building's environmental footprint. Native landscaping and pedestrian improvements complement a planned rooftop garden.

At the ground floor, flexible gathering spaces and retail amenities are intended to encourage activity and strengthen connections between the building and the surrounding neighborhood. Throughout the building, natural materials, extensive daylight and indoor-outdoor spaces are designed to support occupant comfort and well-being.

The project also demonstrates the value of exchanging ideas across disciplines and international markets. Skanska's U.S. development

and construction teams have drawn on expertise from Waugh Thistleton Architects in England, Holmes in New Zealand and Skanska colleagues in Sweden, applying lessons from established mass-timber markets to the project's structural design and construction strategy.

LESSONS FROM THE COMMERCIAL WORKPLACE

Skanska's experience developing and constructing commercial buildings across the Puget Sound region demonstrates how sustainability can strengthen the relationship between a building, its occupants and the surrounding community. At 400 Fairview in Seattle's South Lake Union neighborhood, high-performance workplace design is complemented by a ground-floor market hall and indoor-outdoor connections that encourage activity beyond the traditional office environment.

In downtown Bellevue, The Eight similarly integrates office space, retail, gathering areas, and landscaped outdoor environments. Together, these projects illustrate how sustainability extends beyond efficient building operations to include the everyday experiences of tenants, visitors and neighboring communities.

DESIGNING FOR PEOPLE WHO LEARN AND HEAL

The connection between sustainability and human well-being is especially important in healthcare and education, where the built environment can directly influence daily experiences. At the Washington School for the Deaf in Vancouver, Skanska's construction team worked alongside Mithun and other project partners to deliver new academic and athletic facilities incorporating mass timber and DeafSpace design principles.

Wider stairways support visual communication through sign language, while improved sightlines, glazing, and fewer blind corners help students maintain visual awareness of their surroundings. Combined with exposed wood and abundant natural light, these features demonstrate how accessibility, material selection and occupant well-being can reinforce one another.

At Fairview Middle School in Silverdale, mass timber in the school's common areas contributes to a more natural learning environment. The project also presented significant construction challenges: Skanska delivered a three-story expansion of more than 70,000 square feet on a constrained site while the existing campus remained operational. Careful construction planning helped minimize disruptions to students, teachers, and school activities throughout the process.

Healthcare projects offer another example of sustainability's human dimension. From the Redmond Cancer Center to the planned University of Oregon Child Behavioral Health Building, design and construction decisions can help create environments that feel less institutional and more supportive of patients, families, and caregivers. Natural materials, daylight and biophilic design — including the use of mass timber where appropriate — can contribute to warmer, more dignified spaces that support the healing experience. In these settings, sustainability encompasses not only energy performance but also comfort, accessibility, safety, and the needs of building users.

A BROADER MEASURE OF SUCCESS

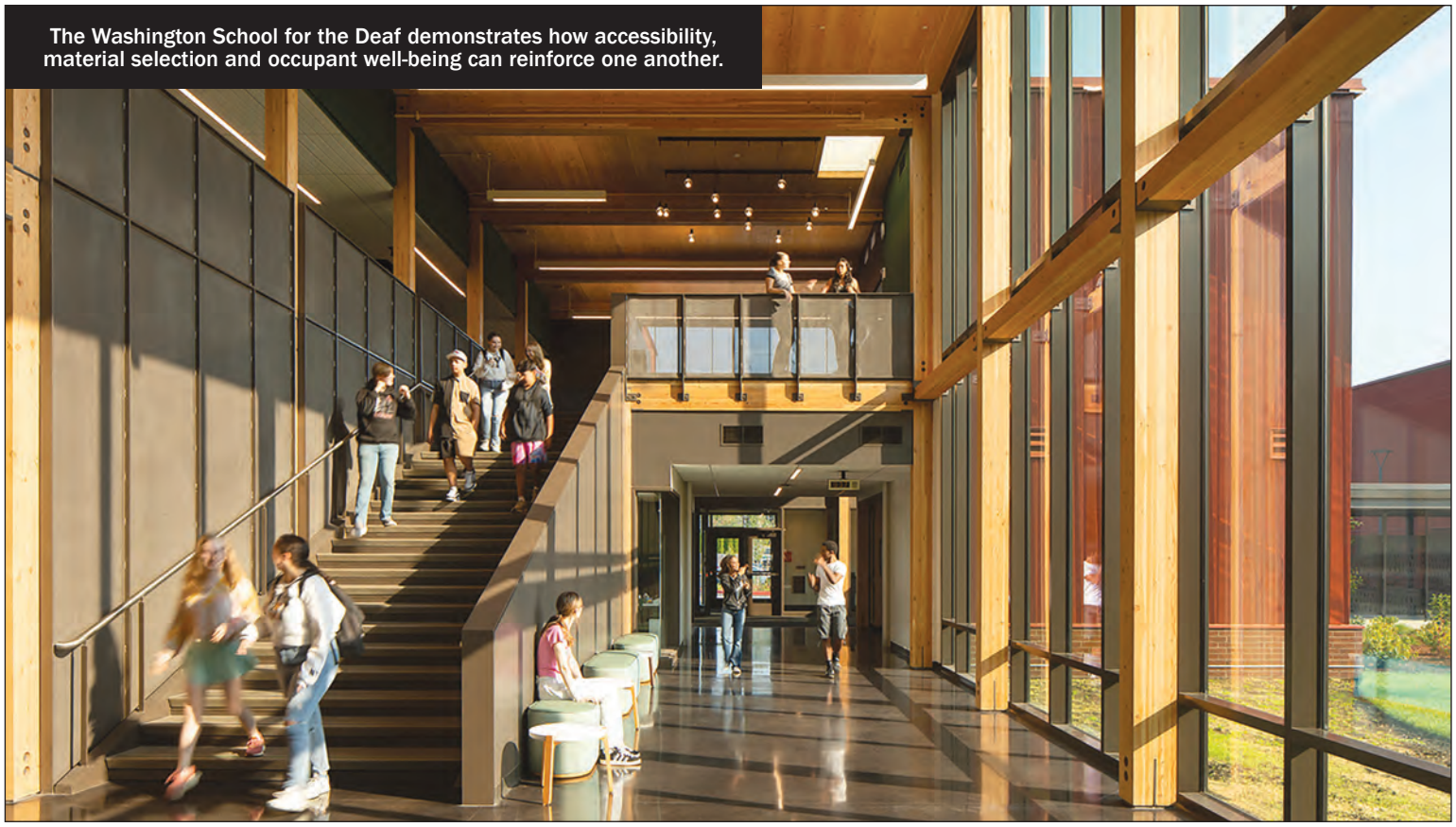
The next evolution of sustainable building requires a broader definition of success.

Environmental metrics will remain critical, particularly as the industry works to reduce both operational and embodied carbon. But the process of delivering a building — and the experiences it creates over time — deserves equal attention.

That means bringing development and construction expertise together earlier, learning from completed projects, sharing innovations across markets, and evaluating decisions through both environmental and human-centered perspectives.

When these priorities are integrated, sustainability becomes more than a collection of building features or certifications. It becomes a strategy for delivering places that are healthier, more resilient and more valuable to the people and communities they serve.

Stewart Germain is director of innovation and sustainability for Skanska USA Commercial Development. Rob Robinson is senior vice president and account manager for Skanska USA Building.



The Washington School for the Deaf demonstrates how accessibility, material selection and occupant well-being can reinforce one another.

PHOTO BY LARA SWIMMER, COURTESY OF MITHUN



Sustainability can strengthen the relationship between a building, its occupants and the surrounding community, like at the fully occupied 400 Fairview, developed and built by Skanska.

PHOTO COURTESY OF SKANSKA

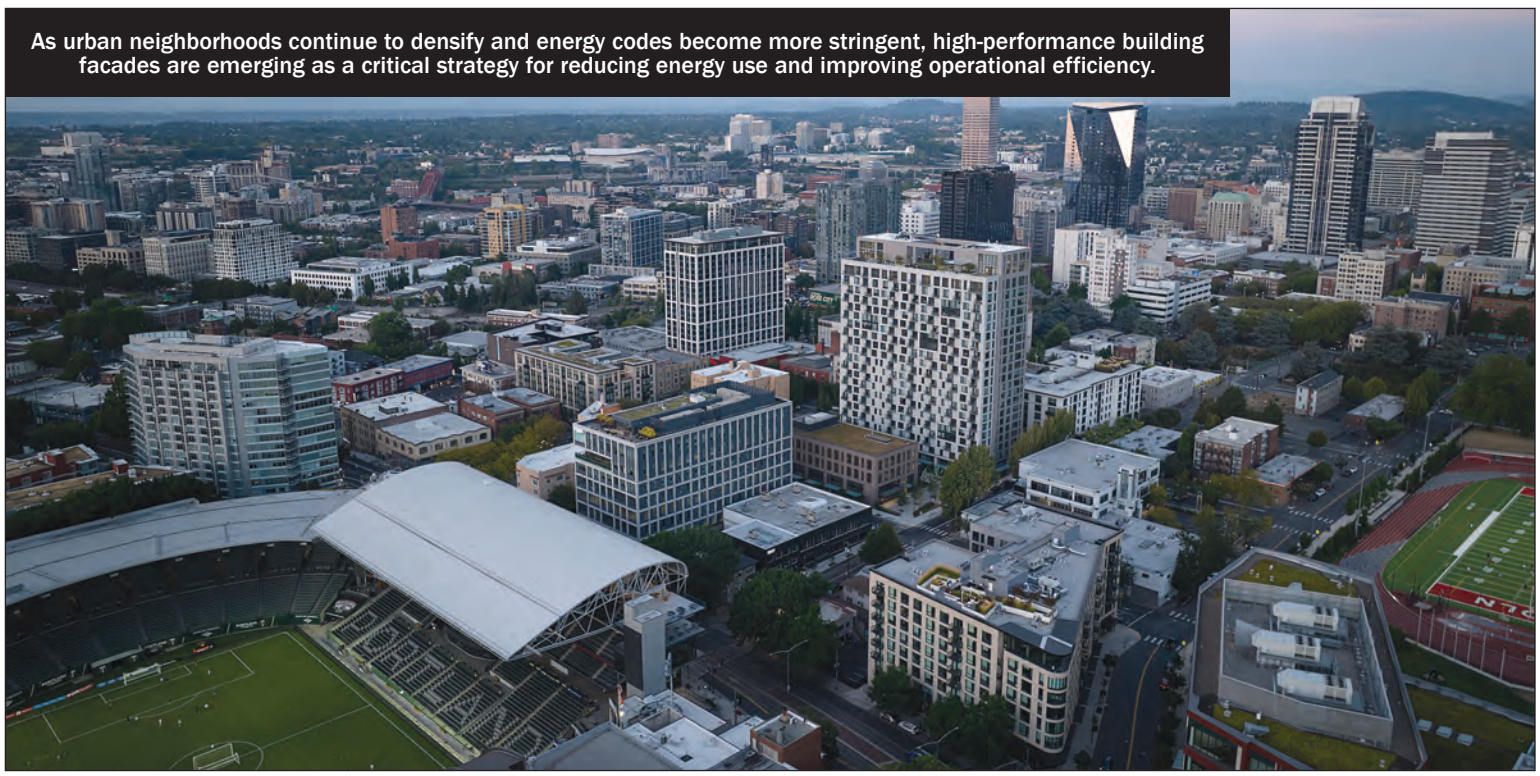
PUSHING THE ENVELOPE

Advancing high-rise residential performance through improved façade design.





BY RACHEL COWEN & ED PALUSHOCK
MITHUN



As urban neighborhoods continue to densify and energy codes become more stringent, high-performance building facades are emerging as a critical strategy for reducing energy use and improving operational efficiency.

PHOTO BY JEREMY BITTERMAN

The residential sector comprises nearly 40% of all new U.S. construction value. As cities continue to increase density, the environmental impact of high-rise residential buildings has become a key variable in the global decarbonization equation.

While the industry's ambition to achieve carbon neutrality is evident, there's a critical misalignment between energy reduction goals and our built reality. As energy code requirements become increasingly rigorous, conventional façade systems will eventually not be compliant. Now is a critical time for AEC professionals to break down long-standing barriers to high-performance envelopes.

WHERE DO WE STAND?

Façade engineering has pushed glazing U-values to optimal performance, lowered allowable air leakage rates and phased out low-performance technologies such as trickle vents, while introducing products to improve thermal barriers (e.g. vapor permeable WRB, dual density mineral wool and thermal clips).

Similarly, mechanical engineering has delivered substantial efficiency gains, transforming the building energy systems of multifamily buildings. Paired with national shifts from fossil fuels toward all-electric buildings, the industry has meaningfully reduced carbon emissions as we advance toward the 2030 deadline.

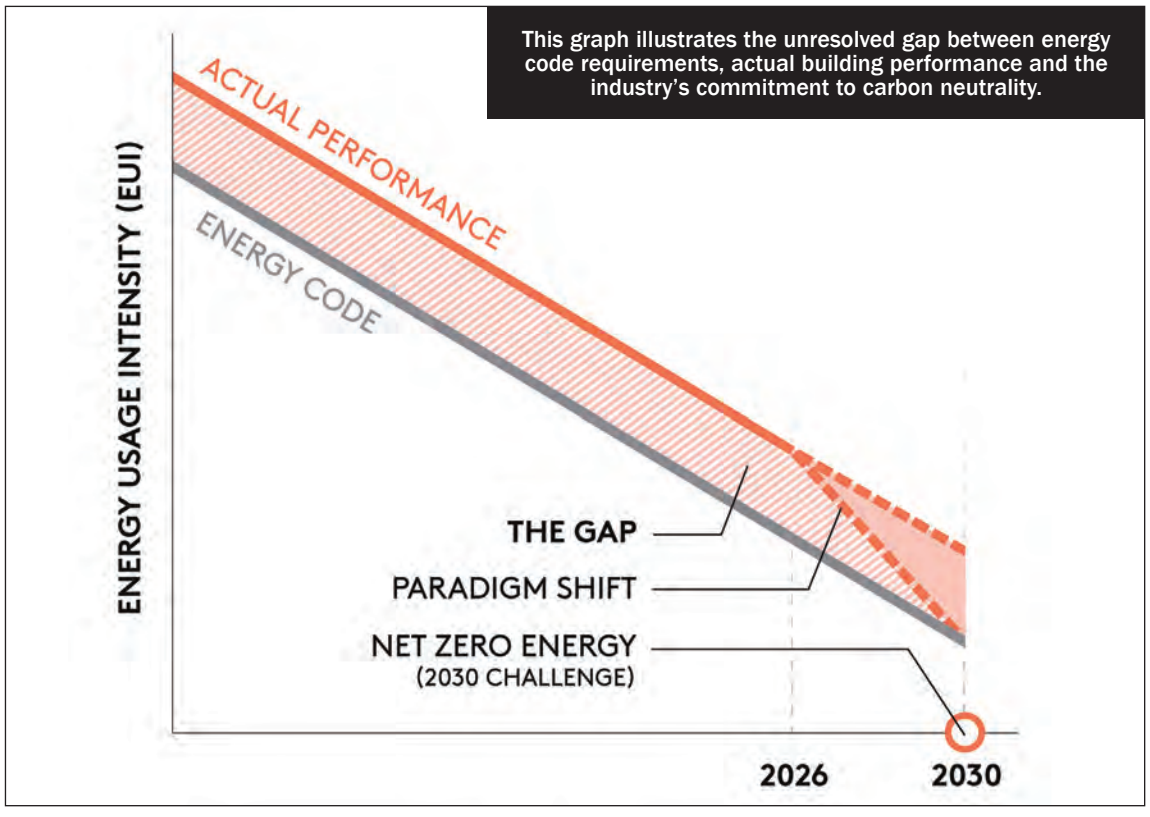
On the other hand, facade assemblies for high-rise residential buildings have not seen significant performance improvements. Most Pacific Northwest developments continue to utilize cost-effective aluminum window wall systems. Reliance on "business-as-usual" façade solutions, particularly within opaque portions of traditional aluminum-framed systems, has resulted in a performance plateau where the hyper-efficiencies of mechanical systems mask the thermal deficiencies of high-rise building envelopes.

While codes have long regulated heat loss through thermal barriers and continuous exterior insulation requirements, they have historically ignored thermal bridging at complex façade details. System interfaces — such as window-to-wall transitions, floor slabs, roof parapets, building corners and junctions between assemblies — are routinely omitted in compliance modeling.

To demonstrate the impacts on facade performance, our research team evaluated multiple envelope systems for a representative high-rise residential archetype in Seattle (a 15-story tower with 180,000 square feet of gross floor area and a 40% window-to-wall ratio). When accounting for thermal bridging (as required under 2024 IECC), standard envelope systems frequently fail prescriptive compliance, relying on mechanical tradeoffs to achieve code minimum targets.

Factoring in real-world conditions such as frame conduction and lateral heat flow across aluminum framing lowers thermal performance by 20-30% from predicted values.

This investigation also underscores the core financial hurdle facing high-performance facades: while delivering lower whole-building Energy Use Intensity (EUI) and reduced utility expenses, higher first costs — combined with the Pacific Northwest's relatively low electricity rates — results in perceived longer payback periods.



This graph illustrates the unresolved gap between energy code requirements, actual building performance and the industry's commitment to carbon neutrality.

IMAGE BY MITHUN

WHERE DO WE GO FROM HERE?

Project teams regularly engage in an HVAC-dominated design process, which typically pairs conventional code-minimum facades with high efficiency systems and modest window-to-wall ratios (WWR) to carry the building's compliance burden.

This process has historically allowed high-rise residential projects to achieve code compliance with a standardized set of assumptions for building facades, but as we quickly approach 2024 IECC adoption, this must change.

To achieve real progress, we suggest systemic shifts in four key areas of practice:

1. PROCESS

Practicing teams must onboard facade specialists during early conceptual design phases rather than delaying their involvement until design development. In parallel, teams should perform an envelope-focused life cycle cost analysis (LCCA) during early planning, allowing stakeholders to evaluate long-term operating efficiencies.

A more holistic analytical approach — one that prioritizes actual over predicted performance — is essential for making informed design decisions that accurately reflect operational reality and potential mechanical downsizing savings.

2. PROFESSIONAL EXPERTISE

Architects, engineers and contractors all have a role in this course correction. Design teams must partner with envelope engineers to help resolve thermal bridging conditions at façade details.

Construction teams must increase their familiarity with industrialized, prefabricated envelope assemblies to normalize these technologies within bidding workflows and eliminate unnecessary contingency premiums.

Concurrently, engineering standards must evolve by establishing confidence in envelope performance through rigorous 3D modeling and remove excessive safety factors to right-size mechanical equipment. Combined, this could free up capital expenditures that can be redirected into higher-performing building envelopes.

3. FINANCE MECHANISMS

The lack of robust financing models in the U.S., compared to those in the EU or Canada, leaves each project to absorb the upfront premium of high-performance facades. Targeted public-private funding initiatives — such as the New York City Future Housing Initiative and Seattle's Energy Efficiency-as-a-Service (EEaS) pilot program — are essential models for offsetting initial capital premiums.

In the broader real estate market, implementing mandatory, transparent building-level energy labeling — as recommended by the Pembina Institute — will establish public visibility for building efficiency, enabling buyers and renters to associate operational thermal performance with asset value.

4. REGULATORY SHIFTS

Top-down policy mandates are necessary to elevate baseline industry standards and eliminate performance loopholes. Jurisdictions must introduce Thermal Energy Demand Intensity (TEDI) limits alongside prescriptive envelope backstops to prohibit compliance pathways that trade off poor facade performance with high-efficiency active HVAC equipment. Energy codes must formally mandate the inclusion of linear and point thermal bridging calculations in compliance modeling, ensuring that unmitigated structural heat loss is accurately penalized.

State and municipal authorities should accelerate the adoption of modern model energy codes (such as ASHRAE 90.1-2022 and the 2024 IECC) to establish high-performance building envelopes as a mandatory legal minimum rather than a voluntary option. Finally, scaling public building energy performance disclosure mandates — such as New York City's Local Law 95 building energy letter grades and Chicago's Energy Benchmarking program — will drive nationwide accountability and institutionalize market recognition for high-performance enclosures.

HOW DO I LEARN MORE?

This article is informed by the preliminary findings of a research group focused on addressing barriers and accelerating adoption rates of high-performance façade systems in high-rise residential construction such that they meet Architecture 2030 Challenge benchmark goals. The research cohort is comprised of Mithun, Stantec, Glumac, Lease Crutcher Lewis and Cascadia Windows & Doors. More information is available through a published series of articles on LinkedIn, with the detailed analysis and findings to be published in spring 2027.

Associate Rachel Cowen is an architect on the Horizon House West Tower design team and R+D researcher evaluating strategies to expand adoption of high-performance façade systems on multifamily projects. Ed Palushock is an architect and principal with extensive experience in design and delivery of residential and commercial office high-rise developments, and a member of the Pushing the Envelope R+D study team.









COMPOSTING AS CLIMATE PRACTICE: INTEGRATING ORGANICS MANAGEMENT INTO LANDSCAPE ARCHITECTURE

Including composting systems can significantly reduce embodied emissions, improve plant vitality and support stormwater performance.



BY CHRISTINE ABBOTT
BERGER PARTNERSHIP



Converting organic waste into nutrient-rich soil amendments helps sequester carbon, improve soil health and support more resilient landscapes.

IMAGES FROM BERGER PARTNERSHIP

Though often viewed as operational or programmatic, composting is directly tied to two of the most urgent climate concerns: greenhouse gas reduction and soil regeneration. In recent years, Berger Partnership has been exploring how the systems we design—soil, planting, stormwater—can take a more active role in climate action. We've found that composting is an overlooked source of potential impact.

Composting became a central conversation as part of our work with the Everett Housing Authority's (EHA) Park District development, where climate performance was a core goal. We began with a question: how could we keep organic waste generated on site — from both residents and landscape maintenance — out of the landfill and in circulation as a soil resource?

The climate case for composting is well-established. When food and yard waste decompose in anaerobic landfill environments, they release methane—a greenhouse gas estimated to be 80 times more potent than carbon dioxide over a 20-year period. While methane dissipates more quickly than CO_2, reducing it can have an immediate impact. Project Drawdown is an organization (and a book) engaged in serious, big-picture thinking around climate action. They list food waste reduction and composting among the most effective climate solutions available globally.

Composting also produces a usable, local soil amendment that reduces the need for manufactured or transported inputs—an ecological and economic benefit for any project that includes plantings or gardens. Compost introduces organic matter, minerals, and diverse microbial communities that support the biological processes underlying healthy soils. Its stable organic matter also increases the soil's capacity to hold water and retain nutrients, making them available to plants over time. In this way, compost can help build more biologically active, resilient soils while turning an existing waste stream into a resource.

For the Everett project, we researched municipal composting infrastructure and learned about new requirements set out in Washington State's New Organics Management Law. Passed in phases between 2022-2025, this law is designed to "reduce methane emissions and slow climate change" and is staged to meet a goal of removing 75% of organic waste from Washington landfills by 2030.

In a first, clear step, the law requires organic waste collection to be provided for single-family and non-residential customers by April 1, 2027. For multifamily projects, the Department of Ecology is requiring nonexempt jurisdictions submitting solid waste plans after July 1, 2026 to establish "programs and a timeline for collection of source separated organic materials from multifamily residences." Per law, these programs "must include newly constructed or substantially remodeled multifamily residential buildings" (RCW 70A.205.540-5(a)).

By April 1, 2030, further regulations will go into effect: jurisdictions will be required to include food waste in their organic solid waste collection and all persons using other curbside services will be compelled to place "all unwanted organic materials into the separated organic solid waste" RCW 70A.205.540-1(d-e).

The law is phased and nuanced, but it pointed to the need to provide space for compost bins at a minimum. We saw potential to go further.

Working with the client, we proposed a closed-loop system: collecting food scraps and yard waste on site, processing it through a small-scale composting facility, and using the finished compost to enrich soils in the landscape and the project's community garden.

The core action within Project Drawdown's solution, "Reduce Food Loss and Waste," is to reduce supply-chain embodied emissions. In other words, there are greenhouse gas emissions associated with producing food (i.e. farm equipment, purchased soil amendments) and with removing organic waste (i.e. vehicles to collect and move waste from one location to another), and wasting less food lowers those emissions.

Having a medium-scaled composting operation within the Everett Housing development would significantly reduce any embodied emissions in moving waste from the development to landfill and compost yard. Instead, organic waste, estimated to be 25-35% of household "trash," would stay on-site, no more than a block or two away from where the waste was generated.

Using planned unit numbers, average trash production per household (3.9 lbs / day) and 24% assumption for organic waste, we estimated that 3.4 Metric Tons (MT) per month of organic waste could be diverted from the trash to a composting facility on-site.

While staffing concerns arose in conversations, more than 40 Metric Tons (MT) of organic domestic waste (from households) added to yard waste would yield enough compost to potentially sell, suggesting some independent financial viability. After all, compost is a resource. As landscape architects, we specify compost for planting soil, and someone has to buy it.

Layered onto these benefits of reduced embodied energy and the output of compost for landscaping, diverting the organic waste from landfills reduces methane emissions. To take the 3.4 MT estimated per month, that would save the equivalent of 2.5 MT of Carbon emitted per month, or 30 MT of carbon saved per year, the rough equivalent of 450-500 tree seedlings growing for 10 years, or not burning about 3,300 gallons of gasoline (source: EPA metrics).

To support this goal, we integrated composting bins into the building layout at the schematic design phase —

an early, simple intervention that ensures composting is logistically feasible.

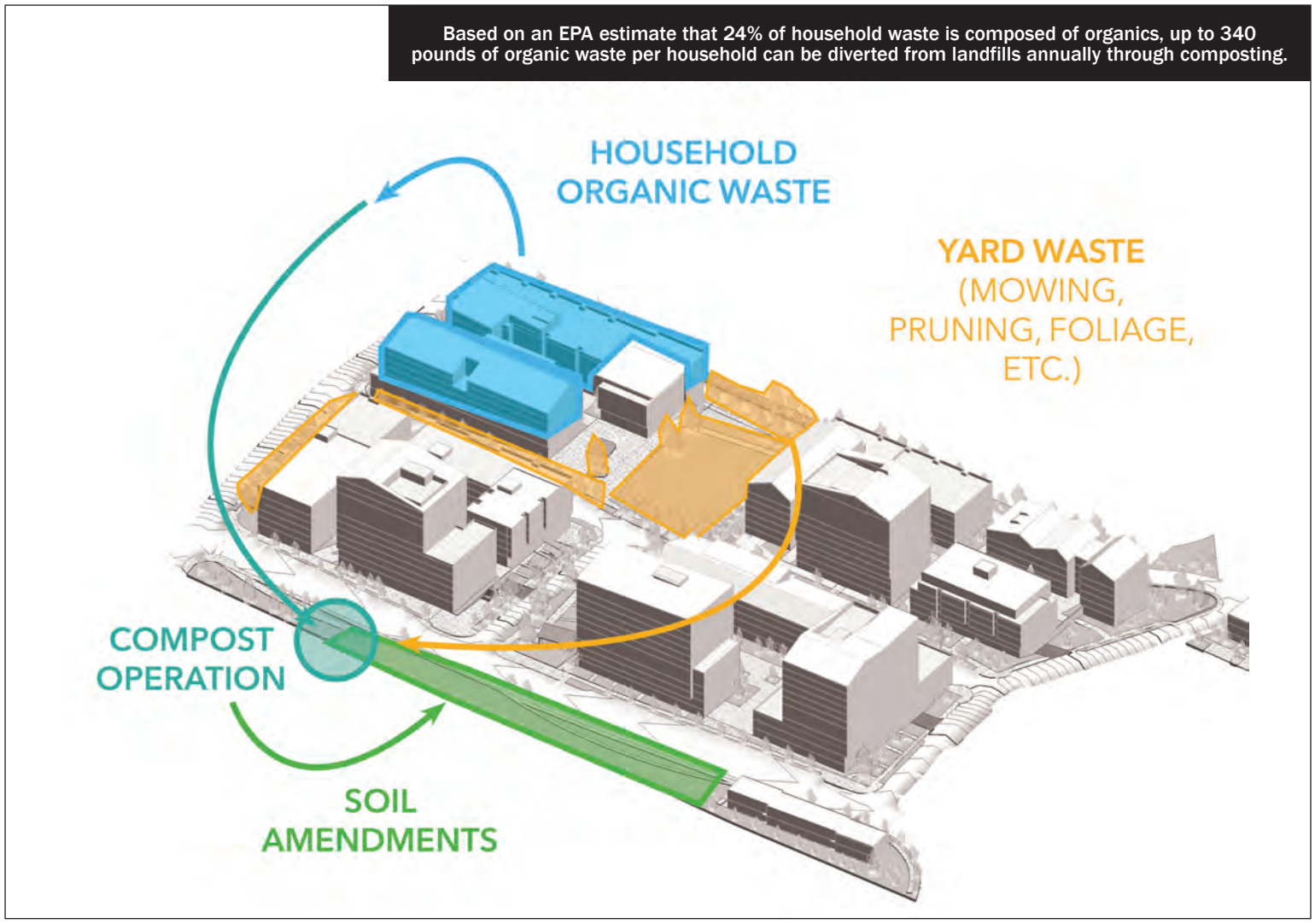
We also studied operational precedents, including Seattle University's on-site composting program, to understand staff needs, processing volume, and infrastructure. Although implementation of a full composting facility remains open-ended, the team intentionally designed it for future adaptability. With cultural and financial support, such systems could scale to become operational—and even self-sustaining.

This kind of design work isn't standard on most projects — especially not affordable housing. But we see it as an essential evolution in practice, particularly for projects where organic waste generation and ongoing landscape management occur at a scale that can support a closed-loop system.

Housing communities, campuses, and other multi-building developments can be especially good candidates, particularly when food service, community gardens, or substantial planted landscapes create both a steady source of compostable material and a productive use for the finished compost. It offers a tangible, site-based intervention that connects global climate goals to everyday resident experience. And because compost is inherently tied to soil systems, its benefits compound; improving plant vitality, supporting stormwater performance, and reducing heat island effect over time.

Our work on composting as a metric for project success reinforces a broader belief: if a project values sustainability, composting — or some form of organic waste recovery—should be considered a baseline design move. When applied at the right time in the design process, these systems are efficient and practical integrations that will optimize the way we use and maintain landscapes.

Christine Abbott is a landscape architect whose interdisciplinary background in architecture, writing, and teaching informs her work on cultural landscapes, housing, commercial projects and parks.



Based on an EPA estimate that 24% of household waste is composed of organics, up to 340 pounds of organic waste per household can be diverted from landfills annually through composting.

SUSTAINABLE

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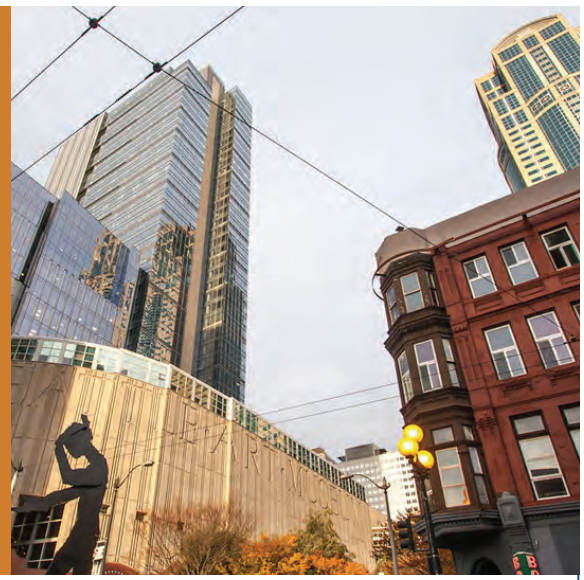
ther reducing the amount of vehicle miles traveled, and the emissions that comes with those miles.

Creating neighborhoods of higher density for everyone from families to couples to single people, can be accomplished through good design. Exciting mixed-use, vibrant communities can be created by good design. Integrating housing, community services, schools and employment can be done through careful design.

At the Seattle Architecture Foundation, we believe that people shape the built environment and it, in turn, plays a significant role in shaping our lives. Great design really matters and is important to everyone. Our tours, lectures and workshops seek to bring this message to city residents. When the public understands the role design plays in their lives, they will want to play an active role in creating their own city.

Jim Bourey is the executive director of the Seattle Architecture Foundation, a past city planner, and the author of three books and over 40 professional articles on managing cities.

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Seattle Office of Sustainability & Environment



Aerial view of Fisher Pavilion with hot air balloons during the Seattle Center Glow event.

PHOTO BY DALE CUNNING

STILL BUILDING THE FUTURE: SEATTLE CENTER'S NEXT CHAPTER IS CLIMATE LEADERSHIP

Seattle Center is carrying the forward-looking spirit of the 1962 World's Fair into a new era, transforming its buildings to create a more sustainable campus and a model for decarbonization.





BY MICHELLE CAULFIELD & ROB JOHNSON
SEATTLE CENTER

In 1962, Seattle Center was the world's window into the future. Nearly 10 million visitors came to the Century 21 Exposition for a glimpse into what the decades ahead might hold.

Today, Seattle Center serves as the community's cultural and civic hub, welcoming nearly 12 million visitors annually for festivals, concerts, sporting events, and more. Yet over these past 65 years most of our campus remains untouched, and buildings meant to last just 36 months are showing their age.

Years of underinvestment have led to maintenance backlogs, failing systems and rising emergency repairs that put this iconic place at risk. Projects such as Climate Pledge Arena, Seattle's Waterfront Park, and recent FIFA activations show how partnership, creative spirit and placemaking can be transformative. A voter-approved bond measure in 2027 could restore this vital arts-and-culture destination and deliver on the promise of Century 21.

The first step to a zero-carbon future is rethinking how buildings are heated and cooled. Rather than replace the campus's aging gas-fired steam plant with more of the same, we plan to replace it, building by building with cleaner, more efficient systems.

A CENTURY OF BUILDINGS, ONE STEAM PLANT

Seattle Center's buildings span nearly a century of history. The Armory, our campus' oldest building, was constructed in 1939 during the run up to World War II. Fisher Pavilion, one of the newest buildings, arrived in 2002.

Despite their different eras and uses, what ties them together is the aging gas-fired steam plant.

Today, that plant heats nine buildings and is beyond the end of its life. Energy is lost in underground pipes or through old, uninsulated walls before it reaches a stage or lobby. That gives us a chance to increase efficiency and reduce costs as we transition to clean energy sources.

BUILDING ON PROGRESS

This work builds on a broader commitment to sustainability. Buildings account for 41% of Seattle's core greenhouse gas emissions. At Seattle Center, public and private projects are showing what's possible.

When it opened in 2021, Climate Pledge Arena became

the world's first certified net zero-carbon arena, eliminating ~5% of the city-owned building emissions by going all electric and installing solar panels adjacent to the landmarked historic roof.

At Seattle Public Schools' new Memorial Stadium, set to open in late 2027, rubble from the original 1947 stadium was crushed on site, with 13,000 tons of material reused as backfill, while preserving the landmarked Memorial Wall.

Those projects have paved the way forward to the next big opportunity: transitioning our aging, inefficient, and carbon-intensive gas-fired steam system into a zero-carbon campus.

ONE CAMPUS, TWO PATHWAYS

Between 2022 and 2024, two engineering studies funded by Washington state and Seattle City Light grants weighed converting buildings one at a time against a campus-wide district energy upgrade. With about 30 resident organizations on campus, any transition must keep performances, exhibitions and festivals running. So, our plan combines both approaches.

Most buildings will leave the steam and chilled-water lines, one at a time, for their own heat pumps, with construction coordinated to maximize community programming. They include the Northwest Rooms (home to KEXP, The Vera Project, and SIFF), Fisher Pavilion, Armory Food & Event Hall, Seattle Rep and Seattle Children's Theatre.

At the heart of Seattle Center's theater district, an upgraded smaller thermal loop will serve McCaw Hall, Phelps Center, Exhibition Hall and Cornish Playhouse. Water-source heat pumps will replace the gas-fired steam plant. Corroding underground steam pipes will be upgraded to reduce the heat loss that troubles the system today.

Construction is phased to finish by 2037. By 2038, energy use intensity for the connected buildings is projected to drop 39%, and annual emissions from roughly 2,030 tons to about 190.

FISHER PAVILION LEADS THE WAY

The 21,000-square-foot Fisher Pavilion and its 20,000-square-foot rooftop host galas, weddings, trade shows and festivals, and it doubles as a backup emergency shelter for up to 1,000 people. Sitting at the far end of the steam line, it is a natural to disconnect first.

Today, Fisher Pavilion emits about 88 metric tons of carbon a year, more than twice the average for a building its size and well above its 2035 target under the city's Building Emissions Performance Standard (BEPS). Because the building is nearly 25 years old, aging systems will be renewed at the same time, saving cost and time.

Rooftop air handlers will give way to advanced energy-efficient HVAC technology. Water heaters, power distribution and operable glass walls will be upgraded, and the building will be solar-ready for future solar array installations on campus.

A $2 million state grant is funding design, with construction targeted for 2028, fueling local hire and apprenticeship opportunities thanks to Seattle's community workforce agreement and strong partnerships with labor organizations.

Fisher Pavilion is more than the first building in line. It's a chance to showcase climate leadership in action and the benefits that come from healthier, greener and more efficient buildings.

LEADING BY EXAMPLE

Seattle Center's plans reflect a broader shift in tackling the climate crisis. Seat-

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Fisher Pavilion at Seattle Center decorated for the Northwest Folklife Festival.



PHOTO BY JOE MABEL

Seattle Center's central boiler plant, the gas-fired steam system that has heated much of the campus for decades, is a key focus of the campus's long-term decarbonization plan.



PHOTO COURTESY OF SEATTLE CENTER

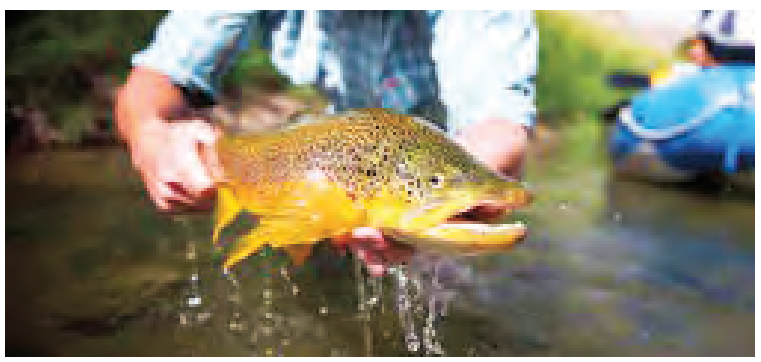


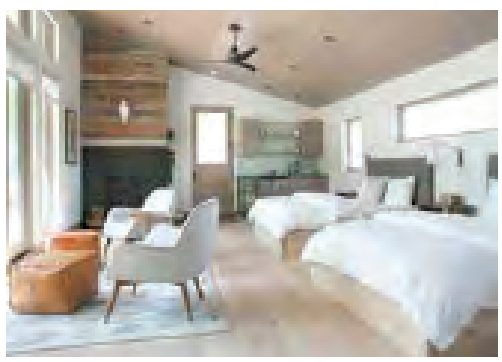
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TACOMA

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that continues to shape the city.

PUTTING BROWNFIELDS BACK TO WORK

For property owners and developers, the larger lesson is that a complicated environmental history does not necessarily make a site undevelopable or incompatible with an aggressive schedule. Unlocking its value may simply require thinking about cleanup differently.

The traditional question is often: What will it take to clean up this property? A better starting point may be: What are we trying to build here, and how does that cleanup fit into future plans?

This distinction influenced decisions throughout the Maritime Center development. The school site needed a highly protective cleanup. Shoreline restoration and cleanup could be done in a coordinated manner. Some materials that required removal from one area were beneficially reused in a different portion of the project.

Permitting accommodated construction that moved on a parallel track. Cultural-resource investigations informed where and how development could occur.

None of this eliminated regulatory requirements. It just helped determine the smartest way to satisfy them.

This is particularly important in the Pacific Northwest, where some of the best-located redevelopment opportunities are also among the most complex — former industrial properties with contamination, infrastructure constraints and histories that can't simply be excavated away.

On the Maritime Center project, careful planning and dedicated investigations into environmental, regulatory and cultural conditions brought potential challenges to light early enough to shape effective solutions. Technical expertise, creative problem-solving and productive working relationships among the parties helped turn those solutions into reality.

Anchor QEA would like to thank Puyallup Tribe Historic Preservation Department staff Brandon Reynon, Jennifer Keating and Mike Shong, and acknowledge their efforts in consultation, sharing information and insights into the project, and field oversight, all of which were instrumental to the project's successful consultation throughout the planning and development.

Mark Larsen is a principal scientist, Rebecca Desrosiers, is a principal engineer and Austin Jenkins is a managing cultural resources specialist at Anchor QEA, the environmental team that led the site investigation and strategy, remediation design, permitting and cultural resources for the project.

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tle's BEPS requires owners of large buildings to reach net-zero emissions by 2041 to 2050, and the city aims to take its own buildings off fossil fuels by 2042.

Seattle Center will demonstrate what that transition can look like — on a campus that is anything but standard.

A MORE SUSTAINABLE FUTURE

The benefits reach beyond carbon: cleaner indoor air during wildfire smoke, reliable cooling during heat waves, and emergency shelter for a safer and more resilient community.

Future phases of decarbonization as part of an overall modernization of the Seattle Center campus would be funded through a proposed 2027 voter-approved bond measure, alongside state, utility and philanthropic support.

In 1962, Seattle showed the world a vision of a brighter future. Today, building a more sustainable Seattle Center calls for that same spirit of possibility — and it will take everyone showing up again: architects, engineers and builders, partners and neighbors, and the millions who visit every year.

Michelle Caulfield leads partnerships and sustainability in Seattle Center's Planning & Capital Development division and most recently served as deputy director of Seattle's Office of Sustainability & Environment. Rob Johnson, executive director of Seattle Center Foundation and a former Seattle City councilmember, first volunteered for Earth Day in 1990 at age 12 — and 30 years later led sustainability efforts at Climate Pledge Arena.

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