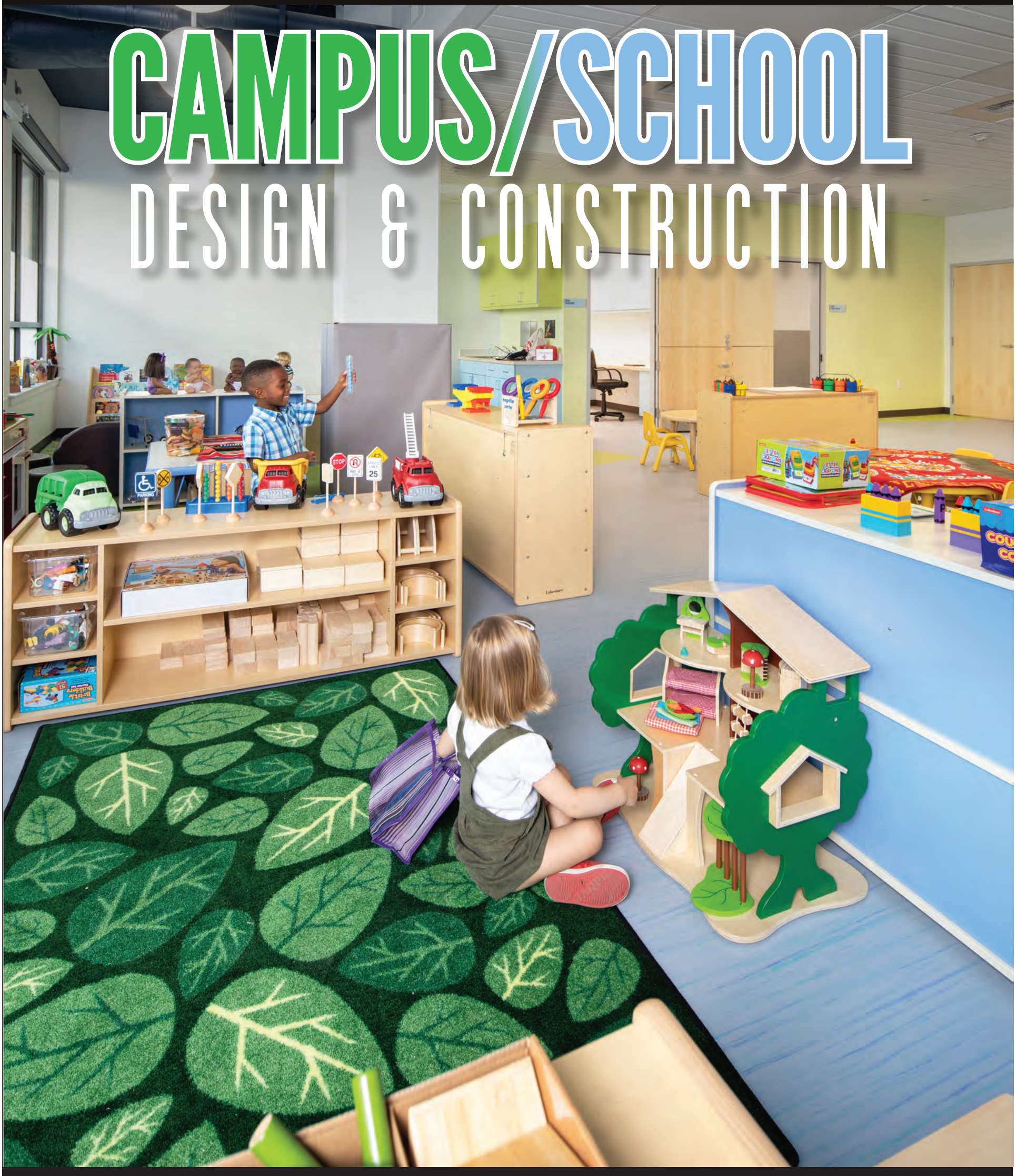
Seattle Daily Journal of Commerce

CAMPUS/SCHOOL DESIGN & CONSTRUCTION



October 6, 2022

THE NEXT GREAT ENVIRONMENT FOR SCHOOLS

Students of all ages have a great environment in which to learn and grow.

From the first day of kindergarten pics on social media to high school football highlights on TV to groundbreaking research being done at colleges and universities across the Northwest, schools are on our minds and in the news almost daily. It's no wonder, because whether or not we have kids of our own, schools are often at the center of our local communities. As such, one thing I hope we can all agree on is that it's important that kids of all ages have a great environment in which to learn and grow.

BY BRIAN URBAN
SKANSKA

But what exactly does great environment mean and how does that impact what we do at Skanska?

To explore this, we gathered a team of executives from several offices across the nation to discuss trends we're seeing in both K-12 and higher-ed school design and construction.

These are some of our key takeaways:

CLIMATE GOALS

Many colleges and universities are aiming to be carbon neutral in the next few years. They have developed strategic plans to transition to all electric buildings and central plants, improve energy efficiency, develop onsite renewables, among other efforts. As they begin assessing their needs for new facilities, sustainable solutions are becoming a central theme of smart, well-crafted design.

Nationally, K-12 school districts are focused on reducing energy consumption and cost through maintenance improvements and assessing new projects through energy life-cycle cost analysis. Most states require minimum standards to qualify for funding — in some cases similar to LEED certification. Some mandates go further, such as in the Pacific Northwest, where there are a number of ways to meet the Washington State Energy Code requirements such as installing solar power or developing all-electric buildings to eliminate the need for natural gas.

Central Kitsap High School features an outdoor space.

PHOTO COURTESY OF SKANSKA USA BUILDING

While the current focus is on operational efficiency, there is growing interest in lowering embodied carbon, too. Our teams have helped K-12 customers identify sustainable building materials in preconstruction to reduce their projects' overall carbon footprint with the Embodied Carbon Calculator for Construction (EC3). Co-developed by Skanska and the Carbon Leadership Forum, EC3 tracks embodied carbon data for construction materials like concrete, rebar and steel, allowing customers

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K-12 ALTERNATIVE DELIVERY IS HERE TO STAY

PDB has grown in popularity as a delivery method for new schools and school renovation projects around the state.

AHBL has completed more than 300 individual K-12 projects for 60 school districts in Washington.

AHBL has a deep commitment to providing value for our clients and through this work has been exposed to many different delivery methods very early on in their adoption in Washington state, including progressive design-build (PDB). Tacoma Public Schools has led in contracting with PDB.

BY ANDREA SAUTER
AHBL

AHBL was a team member on the first progressive design-build K-12 project in the state: Boze Elementary School in Tacoma. Since this first project, we have been involved in over seven additional PDB K-12 schools.

There are many reasons that school districts have begun to explore PDB as a delivery method including:

- Design-builder selected almost exclusively on qualifications.
- One contract with full team accountability.
- Owner control of the budget (guaranteed maximum price, GMP).
- Flexibility and collaboration throughout design.
- Quick evaluation of design options regarding their impact on budget and schedule.
- Faster decision-making during design and construction.
- Early procurement of long lead construction items.
- Phasing of permitting to take advantage of schedule.
- More transparent scheduling allows projects to be completed on time.
- Submittal process is less costly for PDB team than traditional DB, which would typically include a concept design, which attracts more teams and encourages competition.

K-12 PDB PROJECTS

Tacoma Public School's Boze Elementary School replacement project featured several amenities targeted toward a science, technology, engineering, arts, and mathematics (STEAM) curriculum, and serves as a new model of education for the district. As this project was delivered with PDB, collaboration with the owner, architect, contractor, and all other subconsultants was a top priority for the project with weekly coordination meetings throughout the design process and during construction. The project, which opened in 2020, was highly successful with only 10 RFIs and zero change orders. The project was delivered on time, and the contractor was able to provide additive field improvements with cost savings achieved during construction. AHBL worked with Korsmo Construction and BCRA on this $35 million project.

Tacoma Public School's Downing Elementary School replacement project included the design and construction of a two-story classroom addition.

PHOTO COURTESY OF AHBL

PDB OUTCOMES

PDB allowed Tacoma Public Schools to deliver an equitable school in a short amount of time with a limited budget and would become the benchmark against which future school district construction budgets would be measured. Construction on the school started less than 12 months after receiving notice to proceed. Through close collaboration with the city of Tacoma, we were able to use a phased permitting approach, allowing groundwork and foundations to be constructed while the full building permit was still under review.

Tacoma Public School's Fawcett Elementary School replace-

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INSIDE

ON THE COVER

El Centro de la Raza Roosevelt classroom. Turn to page 9 to find out how feasibility and design benefit early learning education.

PHOTO BY CHERYL MCINTOSH/QUANTA COLLECTIV

2022 CAMPUS/SCHOOL DESIGN & CONSTRUCTION TEAM

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DESIGN CAN INFLUENCE BEYOND ITS BORDERS

How the UW-GU Health Partnership building is changing the future of rural health care.

When does a building become more than a physical space?

When its impact reaches far beyond its walls.

Scenically located on the oxbow of the Spokane River at the gateway to GU's campus, the University of Washington-Gonzaga University Health Partnership's building is more than a physical space — it's a catalyst for advancing rural health care education and research locally and around the world.

BY KRISTINA RIVERA
COLLINSWOERMAN

View from the south elevation of the Health Partnership's building.

PHOTOS BY BENJAMIN BENSCHNEIDER

The 109,000-square-foot building at 840 E. Spokane Falls Blvd. is the home of the UW's School of Medicine and GU's Department of Human Physiology. Designed by architect CollinsWoerman, the four-story facility features cutting-edge distance learning classrooms, integrated faculty offices, high-tech laboratories — including a state-of-the-art anatomy suite and a motion capture gait lab — as well as multiple study areas.

The facility is a culmination of UW and GU's Health Partnership, Emerald Initiative, and McKinstry's vision to transform the health and well-being of the region and expand access to rural health care education.

"This new building further strengthens the UW's commitment to Spokane and our health partnership with Gonzaga," UW President Ana Mari Cauce said. "We're proud to partner with them and with clinicians around the region to train the next generation of doctors and health care providers who will provide excellent care to patients in Eastern Washington and beyond."

In addition to being a place where students and faculty from UW and GU can collaborate and learn, the Health Partnership's

building serves a greater purpose — to help advance health care research and solutions that will give rural communities better access to affordable, quality care.

The facility is part of Emerald Initiative's mission to create a medical cluster in the heart of Spokane. Emerald Initiative, an independently owned affiliate with McKinstry, envisions, develops, owns, and operates commercial real estate and alternative energy infrastructure. The organization seeks to grow medical and health education and biomedical research in Spokane to attract new industries, jobs, and investments to the area.

"We are excited to grow this industry cluster approach with the UW and GU Health Partnership," McKinstry CEO Dean Allen said. "By leveraging the strength of Spokane's health sciences community and renowned academic programs, we will help the region remain a top source for critical thinking, technology innovation and health care jobs."

The new building is situated just north of the historic Spokane Inland Empire Railroad (SIERR) facility to create a 145,000-square-foot hub to advance interdisciplinary health sciences education, research, and innovation.

The green wall in the commons area and grand stair that leads to the second-floor classrooms.

COMMUNITY IMPACT

The current strain in health care access is exacerbated by a shortage of medical providers in rural communities. The Washington State Department of Health reports that adults in rural communities face barriers to medical access at higher rates than those in non-rural communities. There is a critical need for more health care professionals to provide care to these communities, and the Health Partnership's building is a leap toward providing the much-needed care.

The Health Partnership builds upon the UW School of Medicine's excellence in medical education and long-term presence in Eastern Washington and GU's deep, local roots and top-ranked undergraduate and graduate health and life science programs. Their programs are a critical pipeline for the region's next generation of health care professionals who will serve patients in the surrounding communities.

"The University of Washington School of Medicine has a 50-year history of excellence in medical education in Spokane and Eastern Washington," UW School of Medicine interim Dean

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and UW Medicine and interim CEO Timothy H. Dellit said. “This world-class health and medical education building will ensure that UW medical students in Spokane have access to an exceptional learning environment and the tools necessary to become the best physicians and leaders of tomorrow. It would not have been possible without our valued partnership with Gonzaga and the vision of McKinstry.”

DESIGN

Integration, innovation, and sustainability were CollinsWoerman’s guiding principles as it created the design for the building. It was essential to keep acoustics, daylighting, and energy-efficient design solutions in mind while integrating the design of the SIERR facility and the future goal of building a health care peninsula.

A dark masonry base sets the stage for color-shifting exterior metal panels and expansive north and south curtain walls that draw light deep into the building through integrated sun shading and interior light shelves. A two-story green wall filled with medicinal and regional plantings provides a lush backdrop for the commons area and the grand stair that leads to the main classrooms.

CollinsWoerman’s design also incorporates a cafe and several areas to study, including study rooms, booth-style study nooks, and a south-facing roof terrace on the third floor.

The design deliberately places the 50- and 100-person classrooms on the second floor and faculty offices on the third floor to integrate staff and students from each university. The fourth floor of the building is shelled and designed to allow for an additional university program, medical office, or private organization to continue the goal to grow the health care peninsula.

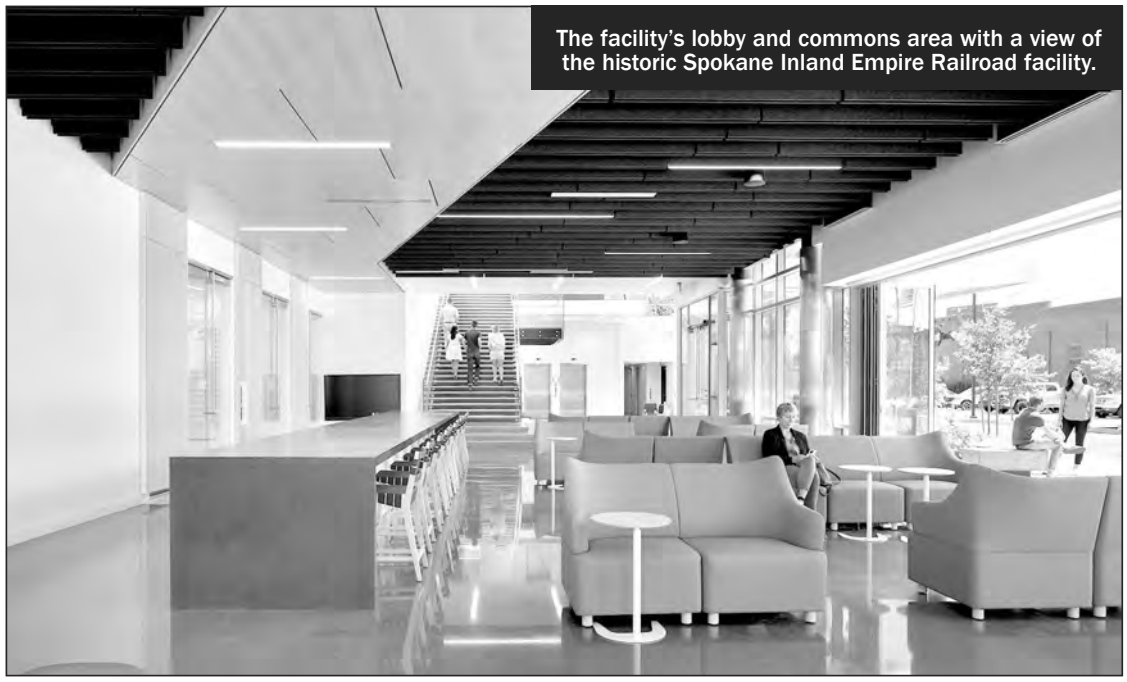
In addition to showcasing a modern classic design, the building seamlessly integrates environmental sustainability in its structure and style. The ultra-efficient building utilizes an open-source ground heat pump that extracts water from the Spokane aquifer to provide a constant water temperature that the building’s mechanical systems uses to heat and cool the building.

LOOKING TOWARD THE FUTURE

The Health Partnership’s building will leave a lasting impact on the future of rural health care and represents many things: a commitment from organizations to provide for their communities and beyond, what’s possible through collaboration between public and private partnership, and how a building can be more than a physical space.

“This building provides significantly more than a new place to attend classes,” UW-GU Health Partnership Executive Director John Sklut said. “It facilitates improved and flexible learning through access to state-of-the-art technology; it provides collaboration space in which teamwork is paramount; it broadens educational and research opportunities with state-of-the art lab spaces; it presents opportunity to welcome additional public or private-sector entities into the enterprise; and most importantly, it reaffirms our commitment to educating generations of health care professionals committed to serving our community.”

Kristina Rivera is the marketing coordinator at CollinsWoerman.



The facility’s lobby and commons area with a view of the historic Spokane Inland Empire Railroad facility.

PHOTOS BY BENJAMIN BENSCHNEIDER

The building’s exterior plaza.

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ment project includes demolition of the existing Fawcett school facility and construction of a new 55,000-square-foot school to house approximately 400 students. The project presents challenges related to the fast-track construction of the new facility on the small, 5.6-acre site that has sloping topography and is surrounded by dense, single-family residential neighborhoods on all sides. AHBL is teamed with Hensel-Phelps and BLRB Architects on this $36 million project that is scheduled to open in September 2023.

Designing Fawcett Elementary with PDB allowed the contractor to collaborate with the design team throughout the design process, resulting in cost savings for the owner. During this process, the contractor reviewed detailed earthwork calculations and during value engineering, suggested rebalancing the earthwork and adjusting site elevations, saving the team enough money to add a synthetic turf playfield to the project at no added cost to the owner. The original project left the existing playfield in place with no improvements. The construction team also provided extensive constructability suggestions throughout the design process. This close project team collaboration was made possible through PDB processes and resulted in significant cost savings for the owner and a better product for the students at Fawcett Elementary.

Tacoma Public School’s Downing Elementary School replacement project included the design and construction of a new two-story classroom addition and the renovation of the existing DA Gonyea Boys and Girls Club to house school administration, gymnasium, and cafeteria spaces. The classroom addition was approximately 28,000 square feet and wrapped around the existing Boys and Girls Club. During the design, care was taken to clearly differentiate the main entries of both the elementary school and Boys and Girls Club to provide for easy wayfinding for students.

The renovated Boys and Girls Club was an existing concrete tilt up building, and renovations included reconfiguring of interior spaces, seismic upgrades to the roof diaphragm, and energy improvements throughout. AHBL was teamed with TCF Architecture and Korsmo Construction on this $31.6 million project that opened in September.

The design of Downing Elementary kicked off in 2020 at about the same time we locked down for the pandemic. PDB was crucial to the success of the project in the unpredictable material market that ensued. The general contractor was able to monitor material availability, and design decisions were reflective of market conditions. Throughout the design, the PDB team worked together with material suppliers and subcontractors, and in multiple cases materials were bought out early to ensure timely delivery.

Other school districts have taken on PDB as a delivery method for new schools and school renovation projects including Issaquah School District, Central Kitsap School District, Bethel School District, and Franklin Pierce School District.

Andrea Sauter is a structural engineer and project manager with AHBL, and has been DBIA-certified in alternative delivery methods since 2018.

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to compare proposed materials and make choices that meet their carbon goals with minimal cost or schedule impact.

SPACE FLEXIBILITY

The need for flexible spaces is becoming a big factor for many school districts. For schools that need increased capacity for certain grades — say, for eighth and ninth grades — we are seeing buildings designed to initially accommodate the larger student body, that can then be converted to fit their next need.

Some school districts are finding value in developing prototype designs, a technique that provides cost and schedule efficiencies through their repetitive nature. For these projects, the design team, construction manager and subcontractors collaborate on multiple projects across a single school district to deliver buildings that are largely identical yet can be tailored to the aesthetics of each school. The projects' "kit of parts" can include the structural system, mechanical, electrical, and plumbing systems. Not only is this cost effective, it's also hugely beneficial for the schedule.

WELL-BEING

The impact of design on mental health is starting to be factored into decisions on how buildings are designed, how they're used, and even where they're located.

One trend we're seeing in K-12 is trauma-informed design options with private (but supervised) breakrooms where kids can decompress when they're feeling stressed.

We're also seeing a trend of incorporating the outdoors into the learning process through the inclusion of outdoor auditoriums/classroom settings and with outdoor learning areas. Nurse logs, native plants, greenhouses and sensory gardens are the most common outdoor elements school districts are requesting.

On one of our Montessori schools, a connection to the natural environment is part of the identity of the school, so the project includes a garden and staging area for students to set their gardening gear (rubber boots and jacket) to dry after cleaning. Similarly, for two local high school projects, we incorporated outdoor gathering spaces, including gardens and auditorium areas for teachers to take classes outside.

BUILDING SECURITY

Across the country, school districts are prioritizing the security of their K-12 buildings to ensure the safety of students and staff. Increased public demand for heightened safety measures is driving the type of funding schools seek.

A common design choice we're seeing is establishing a more secure school through implementing a single point of entrance that distributes students and staff through buildings or better secured outdoor areas. The change in design also often employs a secure vestibule where administrators have to grant visitors access into the building during the school day.

Our customers are focusing on security systems with reliable communications and increased lockdown capabilities. For dependable and easy communication with first responders, school districts are installing or upgrading distributing antenna systems (DAS). Exterior identification, like large classroom numbers, are being added to exterior walls and roofs for quick identification by the police or fire department. Additional measures include security cameras, card reader door locks, blackout glass for single-way visibility, and ballistic-resistant glass in select areas.

IMPORTANCE OF ACOUSTICS

Acoustical treatment in schools has been commonplace for some time, whether to amplify sound for theaters or reduce noise in the industrial arts classrooms (a.k.a. shop class). Sometimes, entire schools require an extra level of acoustical attention due to their surrounding environment.

One of our high school projects, for example, was located a few miles from one of the runways at Sea-Tac Airport. The district wanted to ensure that students, faculty and staff had the best environment, so a grant was secured from the FAA to cover the cost of acoustical elements to dampen aircraft noise. Skanska helped the school district evaluate components and materials that would affect acoustics.

COMMUNITY MEMBERS' ROLE

Universities are establishing committees as part of their governance structure to advise on how buildings will be designed, built, and used. These committees are often made up of community members, leaders of neighborhood groups, former students, local tribal members, and other stakeholders.

At the K-12 level, since many school construction projects are funded through tax levies, the voices of community members are often as important as the teachers and administrators. The goal is to ensure that all input is considered and that concerns are addressed before shovels hit the ground.

Just as our kids grow and their needs change, so too with the needs of our local communities, schools and school districts. As trusted partners, it's imperative that we remain ahead of the latest trends and help guide our client partners as they work to create the next "great environment" where our young people can learn and grow.

In his role as vice president at Skanska, Brian Urban provides leadership for the company's K-12 practice, which represents more than $750 million of community-focused projects in the Puget Sound area.

Fife Elementary School
Fife Public Schools, Milton, WA

FEASIBILITY AND DESIGN IN EARLY LEANING EDUCATION

Good design can help reinforce the mission of the center.

Our region is suffering from a significant childcare shortage.

The Washington Child Care Collaborative Task Force estimates the total childcare capacity in King County has declined by over 25% since the beginning of the COVID-19 pandemic. This created wide-ranging consequences throughout the economy, delaying the ability of parents to return to full-time employment. As the direct impacts of the pandemic fade, many childcare providers now seek to increase their capacity either through construction of new facilities or expansion of existing ones.

BY FORREST MURPHY
CAST ARCHITECTURE

Early Childhood Education (ECE) is governed by sets of overlapping regulatory requirements. This article aims to provide a brief overview of some of the most important considerations in feasibility and early design phases.

BUILDING-SCALE

There are important features inherent to the space itself that cannot be easily added. These requirements must be factored into the cost model for construction, and into a decision for leased space. The following is based on the requirements of the Washington State Building Code (WBC) and the State of Washington Department of Children, Youth, and Families (DCYF) Childcare Licensing Guidelines.

- Childcare centers are typically a Group-E occupancy; sprinklers are required. Lack of sprinklers is a common red flag in early feasibility analysis.
- Classrooms for children younger than 30 months must be on the ground floor and must each have an exit door directly to the exterior. Classrooms for children between 30-60 months in age may be no higher than one story above grade and may share common exit pathways.
- It is important to verify the proposed space will comply with the requirements of Chapter 5 of the WBC. Group-E occupancies have a smaller allowable area and higher occupancy-separation requirements than other uses in the same type of construction.

El Centro de la Raza's Early Learning Center at Cedar Crossing opened in September.

PHOTO BY CHERYL MCINTOSH/QUANTA COLLECTIV

ECE CONSIDERATIONS

DCYF will license a center for maximum number of children, based on an operating plan that maintains certain ratios of adults to children all times. It is important the design does not unintentionally reduce the allowable number of children or increase the required staff count by misinterpreting DCYF regulations.

- One important example is the minimum area per child. The WBC sets out an occupancy load factor of 35 square feet; the parallel requirement under DCYF is also 35 square feet per

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child. However, DCYF only considers space that is accessible to children at all times. Areas of the room that are considered occupiable under the WBC — such as a teacher's work desk or a locked cabinet containing art supplies — are excluded from DCYF's area calculations.

- A classroom for 20 children must be designed for at least 22 or 23 persons, since the adult caregivers must also be included in the calculation. For feasibility planning, we have found that if we assume 50 square feet per child, the final design will comfortably accommodate the planned student count.
- A minimum of 75 square feet of outdoor play areas must also be provided, and this area must also include the caregivers. While a single play area can be shared between multiple classrooms, large centers will need to carefully schedule such shared use. Creative alternatives such as walking to a local park may substitute for dedicated outdoor play areas, but these require increased staff levels and are reviewed on a case-by-case basis by DCYF.
- Current DCYF practices require a large number of plumbing fixtures: Separate single-occupant restroom(s) for adult use; child toilet rooms with child-height sinks and toilets; with both assisted and semi-private toileting; adult-height handwashing sink at building entrance; child-height handwashing sinks at each classroom entrance; bottle fillers at each classroom and at outdoor play area; adult-height handwashing sink at food distribution area, even if food is prepared elsewhere; and adult-height handwashing sink at diaper-changing areas within arm's reach of changing table.
- Kitchen facilities must be carefully considered in the center's plan for operation. While ECE kitchens are generally not required to be licensed as commercial kitchens, DCYF personnel review them using Department of Health guidelines: Use commercial-type refrigeration with continuous temperature display on the exterior; any on-site food preparation beyond distributing pre-prepared items on disposable plates will require a dedicated kitchen space with separate handwashing, food preparation, and three-compartment dishwashing sinks; and some types of hot food preparation can be accommodated with residential-grade cooking and ventilation equipment, this will significantly limit potential menus. Any operations utilizing grilling or frying will require installation of a full Type-II commercial range hood. This can be impossible in a space not designed for it from the ground-up.

El Centro de la Raza Roosevelt classroom with a ceiling difference to denote activity changes.

PHOTO BY CHERYL MCINTOSH/QUANTA COLLECTIV

The classroom at Refugee Women's Alliance is filled with natural light.

IMAGE COURTESY OF CAST ARCHITECTURE

CLASSROOM-LEVEL CONSIDERATIONS

Good design can help reinforce the mission of the center. This covers a lot of potential ground, but here are a few areas where we often focus attention:

- Clarity of wayfinding is critical for young children and is often a challenge within an irregular tenant space. If the layout must be complex, color, lighting, and material changes can give each group of classrooms its own identity. Larger gathering nodes outside classrooms can accommodate busy student dropoff and pickup.
- Many designers associate ECE with bright primary colors; keep in mind, that classrooms will be filled with a huge variety of educational materials and children's projects in a rainbow of shades. Letting the architecture create a clean, muted backdrop helps organize the inevitable chaos.
- Understand the routines of a child's day and let those guide your design. Snacks and meals will be served and eaten in a certain way. If the classroom doesn't have a designated place for folding or stacking mattresses, they will take up a corner of the room that is not available for playtime. If a cozy space for reading or quiet play isn't inherent in the geometry of the room, create one with casework, furniture, or a change in lighting or ceiling height.

A classroom at Refugee Women's Alliance is an inviting place for learning and play.

IMAGE COURTESY OF CAST ARCHITECTURE

Many different elements must be balanced to achieve a successful ELC design. Details aside, the most important element is to really get to know your client and their operation. It is hard to go wrong by listening carefully to the teachers who spend all day in the classroom.

Forrest Murphy is a principal at CAST Architecture and has spent much of his career helping nonprofit and institutional clients balance programmatic and strategic goals with technical and budgetary realities.

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TEAMWORK CREATES MODERN, FLEXIBLE SPACES TO LEARN

Collaboration makes way for the innovative CLT structural system at the UW Health Sciences Education Building.

Classrooms at the 97,000-square-foot interdisciplinary Health Sciences Building are flexible to encourage collaboration.

PHOTO PROVIDED BY LEASE CRUTCHER LEWIS

BY DUNCAN HOWARD, BRADLY GUNN AND JACOB MCCANN
SPECIAL TO THE JOURNAL

At the Health Sciences Education Building, a newly completed 97,000-square-foot learning space on the University of Washington campus, the design-build team of Lease Crutcher Lewis, The Miller Hull Partnership and SLAM partnered to deliver a health education facility that pairs flexible spaces with modern technologies to enable interdisciplinary and team-based learning for future health care professionals.

The team was tasked with maximizing the building program and finding a way to integrate cross-laminated timber (CLT) into the design and construction. At the project's onset, the university's

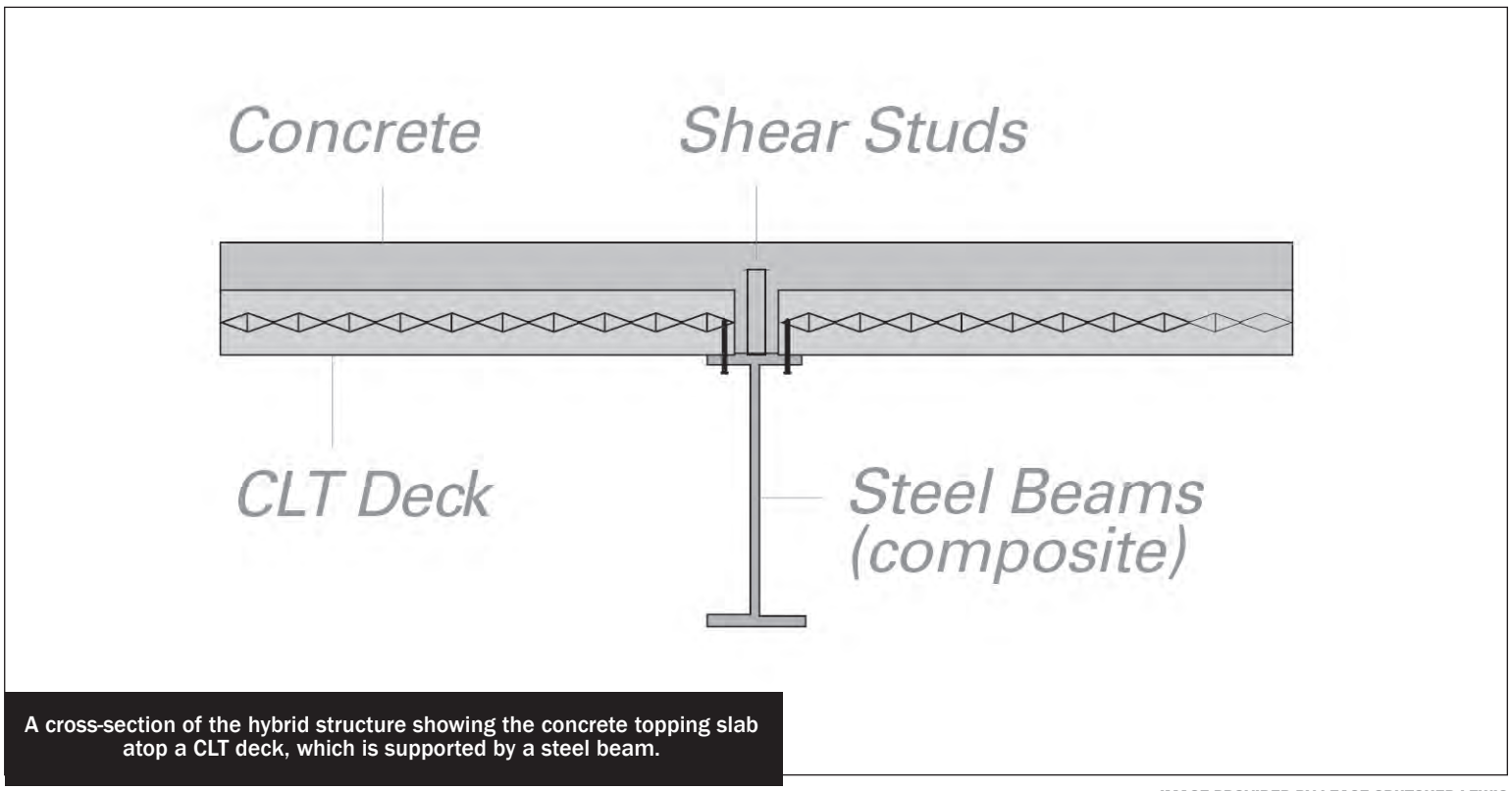
Project Delivery Group asked, “Is there any reason this building can’t be CLT?”

The answer was not simple. Too many variables factored into it — from program to cost, to building performance — and no single team member had the full answer. This is where the valuable collaboration and problem-solving afforded by progressive design-build came to fruition. To provide the UW with an answer, the design-build team brought all the project partners in a room — from KPFF to Structurlam, to Miller Hull and Lewis — to run numbers, discuss challenges and find a solution that met program, schedule and budget needs.

BUILDING PROGRAM

During project definition, the team dug into the details and recognized that a full mass timber structure would require too many columns, prohibiting open collaboration and flexible classroom spaces — a critical component of the intended program.

Led by KPFF, the design-build team identified a new hybrid system, which incorporates long 53-foot spans of steel beams, topped by a CLT panel and a finished concrete topping slab. The system harnesses the long spans afforded by steel beams, allowing for enhanced program flexibility and future uses.



A cross-section of the hybrid structure showing the concrete topping slab atop a CLT deck, which is supported by a steel beam.

IMAGE PROVIDED BY LEASE CRUTCHER LEWIS

PROVING THE SOLUTION

A hybrid structural system like this is undefined by the building code, so before the team could begin design and construction, it needed to research and test the system to prove it was a viable option.

Lewis, Miller Hull and KPFF partnered with university faculty, staff, and graduate students to design, procure, install and test a series of composite panels inside the university’s structural engineering laboratory. Not only did this provide the information required to advance the project from a code standpoint, but the testing also provided an invaluable opportunity for UW students to participate in practical applications of theory and research, learn first-hand from tradespeople how work is executed, and tangibly contribute to the development of the campus around them.

A portion of the testing was funded by a Wood Innovations Grant from the U.S. Forest Service to study the floor vibration of CLT panels. These test results will be published to help engineers optimize the design of future CLT buildings, helping to

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FLEXIBLE SPACES

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make CLT a more viable and cost competitive structural system.

APPROVAL AND LOGISTICS

Progressive design-build compresses the overall project duration, and the CLT permit approval was uncertain, so the team had to remain flexible. The team designed a structural system that could accept either steel decking or the CLT hybrid system depending on the results of the performance testing. Once the permit was approved, the team could immediately order CLT to place on-site. Since Structurlam was an integral part of the planning and decision process, it could fulfill the order and keep the project progressing quickly.

With a new structural system comes new challenges and opportunities to establish best practices. The project team proactively engaged industry experts and associations to understand concerns that accompanied the use of CLT panels in this application, then supplemented this feedback with expert knowledge to develop mitigations for each challenge.

The team worked with Structurlam and MEPF partners to identify and cut hole penetrations at the factory — ensuring consistency and quality while shortening the installation time. Moisture protection measures, hoisting methods and steel bearing tolerances were coordinated by the entire team prior to delivery and installation. The detailed coordination meant the team could beat production rates — placing each 20,000-square-foot deck in 1.5 to 2 days — and incorporate $65,000 of value back into the project.

The challenging structural components at the Health Sciences Education Building are a prime example of the importance of team collaboration and mutual trust, as well as the value design-build brings to complex projects. When a team is aligned around a common goal with the right experts in the room to make decisions, innovative solutions are born.

The Health Sciences design-build team rallied around the university's goals for CLT use in its building to find an innovative hybrid CLT solution that meets program and budget needs while complementing the biophilic design of the building. As we continue to push boundaries and solve complex problems, it is in our best interest to do so as a shared team.

Duncan Howard is a project manager at Lease Crutcher Lewis; Jacob McCann is a principal at KPFF Consulting Engineers; and Bradly Gunn is a project architect at Miller Hull Partnership.

The team completed several full-scale mock-ups to test the structure for vibration control, composite strength and more.

PHOTO PROVIDED BY KPFF

CLT panels were fabricated off-site with hole penetrations for MEPF prior to installation on-site.

PHOTO PROVIDED BY LEASE CRUTCHER LEWIS

DESIGNING A CO-LOCATION CAMPUS

UW Bothell/Cascadia College show how leveraging sound planning and innovative partnerships are beneficial.

The University of Washington Bothell (UWB) and Cascadia College (CC) campus was established 26 years ago and is jointly occupied by both institutions.

Located just east of Bothell's downtown core, the campus was originally created as a planned unit development and relied on an approval process that required updating with every capital project — a cumbersome and costly process for both institutions.

BY MARK CORK
MAHLUM ARCHITECTS

In 2016, UWB and CC joined forces to initiate a new campus master plan (CMP) in partnership with the city of Bothell. Their goals included establishing an overarching vision for growth and development on their uniquely co-located campus, as well overhauling and streamlining the jurisdictional process for initiating and executing future projects.

Following the lead of the UW Seattle campus, UWB and CC initiated a process to develop a CMP that not only charted the course for both institutions to grow alongside each other, but also established and codified the city's jurisdictional/land use requirements and the processes for review, assessment and approval of capital projects.

Recipient of an Excellence in Planning award by the Society for College and University Planning, the 2017 campus master plan was developed by a Mahlum Architects-led planning team in partnership with UWB, CC, the city and, ultimately, various transit agencies. Guiding principles and design guidelines for campus development were established to maintain consistency with the campus' current design character and to strengthen connectivity and relationships with the adjacent community and city of Bothell at large.

The CMP vision includes several significant moves, including:

- Improve accessibility by extending Campus Promenade, the campus core's primary pedestrian pathway, to better connect to transit and adjacent Bothell neighborhoods.
- Minimize modal conflicts by streamlining vehicular access and emphasizing pedestrian and bicycle circulation.
- Improve pedestrian and bicycle safety by creating a new transit hub that would remove over

CO-LOCATION CAMPUS — PAGE 16

CC5 Gateway building from Campus Promenade.

Husky Village Redevelopment from Campus Promenade.

IMAGES COURTESY OF MAHLUM ARCHITECTS

UW Bothell/Cascadia College long-term campus vision.

CO-LOCATION CAMPUS

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500 bus trips per day from the campus core.

- Formalize the entrance to the campus core by replacing the existing transit loop with Campus Crossing, an iconic landscape that also connects the existing upland conifer forest to the North Creek wetland.

Within five years of the CMP's completion, key partnerships that were established and/or strengthened during the planning process have resulted in three major capital projects that are currently in design or under construction and represent significant progress toward realization of the specific elements of the campus vision described above.

SHARED STEM BUILDING

Prior to the 2017 CMP, UWB and CC had each separately planned and submitted capital requests for new STEM buildings. The strengthened partnership between the two colleges resulted in a combined request for one shared STEM building — the first shared academic building on campus.

Combining their resources enabled both institutions to meet growing demand for STEM education sooner, more efficiently, and with less campus disruption than if each institution had acted alone. UWB and CC were allocated joint funding for the 79,000-gross-square-foot STEM4 building, currently under construction by the design-build team of Lease Crutcher Lewis and Mithun. The project cost is $79 million and it is scheduled for completion in fall 2023.

STUDENT HOUSING

In 2011, UWB had acquired a 1980s-era apartment complex dubbed Husky Village and repurposed it into student residences to address growing housing demand. A critical component of the CMP, the Husky Village Redevelopment is a 295,000-gross-square-foot replacement project that includes 1,055 new student beds (a net increase of over 800 student beds) to meet both first year and upper class student needs, as well as a dedicated food service facility to serve the residents and broader campus community. This project also incorporates a Sound Transit stop at a proposed bus rapid transit line at the campus perimeter and extends the accessible Campus Promenade to link the new campus gateway to the academic campus core.

The Husky Village Redevelopment created a new form of partnership for the campus — a ground lease agreement between UW and Capstone Development Partners. Capstone will develop and build the project, and its affiliate Capstone Management Partners will operate and maintain the four-building facility for up to 70 years. The design-build team of Andersen Construction and Mahlum Architects was engaged to realize this two-phased, $160 million project, currently under construction and scheduled for completion in fall 2024.

STUDENT SERVICES FACILITY

Meanwhile, Cascadia College is seeking state capital budget funds to construct its CC5 Gateway project at the edge of the future Campus Crossing and at the north entry to the academic campus core. The recently approved pre-design study by Mahlum Architects envisions a new facility consolidating student services for Cascadia students implementing the Guided Pathways principles as adopted by the state Board for Community and Technical Colleges. These principles hold that improving visibility, access, and successful navigation of student services, particularly to students from disadvantaged and underrepresented populations, is critical to student retention and success. Consolidating these services in a new facility at the gateway to the academic campus core will achieve these goals and strengthen Cascadia's identity on the shared campus.

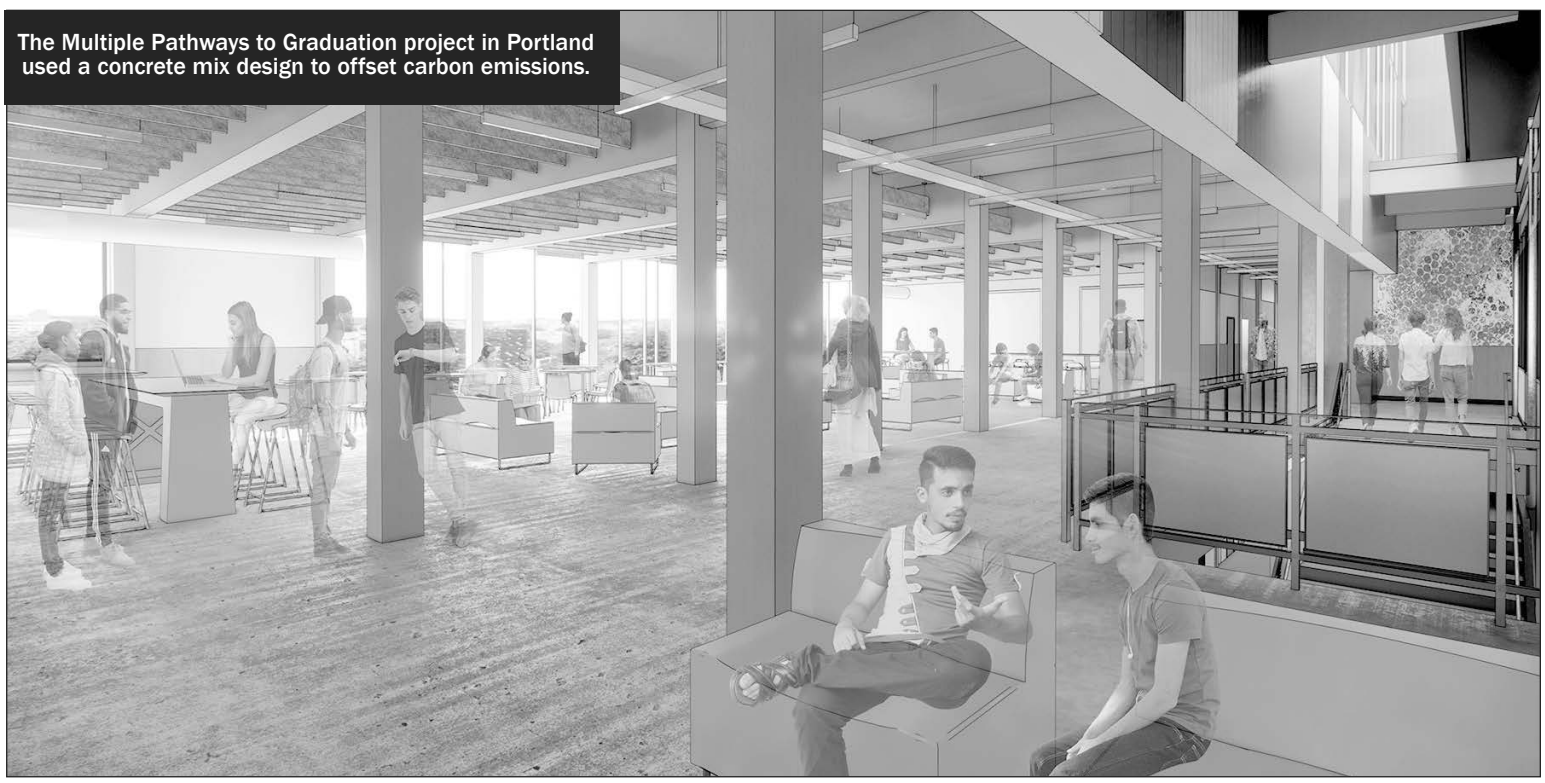
The 37,000-square-foot project has a project budget of $41 million with construction funding to be included in the 2023-25 capital budget request. The project will utilize the general contractor/construction manager delivery method and is currently scheduled for completion in spring 2025.

The 2017 UWB/CC campus master plan established a bold vision for the future development of the Bothell campus. In five short years, UW Bothell and Cascadia College have moved three strategic projects forward on this unique, co-located campus. Leveraging partnerships and working together across boundaries, these projects are revealing a richer, more integrated future and furthering the campus vision at a pace that is exceeding all expectations of the planning team.

As the leader of Mahlum's higher education studio with over 30 years of architectural experience, Mark Cork offers insight into campus and facility planning issues for both educational and health care institutions.

HERE'S HOW TO DECREASE CARBON EMISSIONS IN SCHOOLS

Globally, the embodied carbon of construction equals about 10% of total emissions.



The Multiple Pathways to Graduation project in Portland used a concrete mix design to offset carbon emissions.

IMAGES COURTESY OF BASSETTI ARCHITECTS

According to Architecture 2030, buildings produce approximately 40% of total global emissions of carbon dioxide. Most of those emissions are from the annual energy consumption of existing buildings. In response, architects and policymakers have focused for the past several decades on decreasing the energy use of renovations and new buildings.

BY KRISTIAN KICINSKI
BASSETTI ARCHITECTS

As a result of those efforts, the operational efficiency of new buildings has greatly improved. As energy use declined, the embodied carbon emissions generated during the manufacture and construction process of new buildings became a much larger portion of the building's overall footprint. Globally, the embodied carbon of construction equals about 10% of total emissions, or about one quarter to one third of the total emissions attributed to buildings. However, for new buildings, the ratio is lopsided in the other direction. It takes between 20 to 30 years, sometimes longer, for the cumulative operational carbon of energy consumption to equal or exceed the embodied carbon footprint of the initial construction of a new building.

The architecture industry is taking note. Many architects are now focused on finding ways to reduce the embodied carbon of their designs. These strategies can span from the reuse of an existing building to careful material selection. Nonprofits and universities are working to provide knowledge and resources to the industry. At the center of the movement is the Carbon Leadership Forum, a think tank housed at the University of Washington that performs research and develops tools to help the industry reduce embodied carbon.

It's a rapidly developing area of architectural practice. We're learning new strategies and refining our approaches with each project. It's an exciting time. Architects are sharing and collaborating with each other on these solutions. We're all working towards a global solution to the climate crisis. Bassetti Architects' practice focuses on K-12 schools. School buildings utilizing innovative methods to reduce embodied carbon emissions present an educational opportunity for students to see examples of buildings, and those responsible for creating them, demonstrating stewardship of the environment.

REUSE

The most impactful decision regarding embodied carbon occurs when deciding to build new or renovate an existing building. School districts often face this decision when seeking to improve older facilities and expand capacity. There are many factors to consider, such as seismic conditions, available land, and the logistics of improving a school that students already attend. When architects can help find solutions that reuse existing structures, it can have a big impact. A report completed in 2011 by the Preservation Green Lab, now the Research and Policy Lab at National Trust for Historic Preservation, looked at a 75-year lifespan of buildings and ran comparative studies across different project types in different regions of the U.S. In all cases, the study found that rehabilitation and retrofit of existing structures resulted in typically 30% fewer carbon emissions over the life of the building when compared to new construction.

Pre-WWII buildings are well suited for energy efficiency upgrades. Designed around minimal mechanical and electrical systems, the buildings were designed to maintain comfort without much energy use. Benson Polytechnic High School in Portland (currently under construction) will restore the historic 1916 main classroom building, the 1927 gym, and the 1930 auditorium. Benson's modernization will completely reconfigure and update learning spaces with a focus on indoor environmental quality, sustainability, and historic preservation. By applying life cycle assessment (LCA) methodologies and tools, the design team was able to compare the proposed renovation design against the carbon impact of demolition and new construction. The resulting data showed that the replacement building would have a higher initial carbon impact than the proposed design.

USING LESS

Another strategy architects can pursue is to reduce the quantity of materials in buildings. This strategy typically also has cost benefits, which makes it a compelling approach for architects and owners alike. On a recent project, Bassetti worked with the structural engineer to optimize the concrete footings. Using an angle to support the brick veneer instead of concrete allowed the team to reduce the width of the stem wall by 30% around the perimeter.

Concrete has the highest embodied carbon of all material on a project, so any time we can use less concrete, we're making significant reductions to the overall carbon footprint.

Another place where Bassetti has found an opportunity to reduce material is the building envelope. In recent years the firm has prioritized energy efficiency and increased the insulation in walls and roofs. But what we found is that we hit the point of diminishing returns. Energy use in schools is dominated by the ventilation load in the classrooms. By balancing insulation with high-performing windows, Bassetti works with its mechanical engineers to reduce insulation levels while still meeting energy code and saving energy. The approach results in a minimal increase in energy use but creates a net savings in embodied carbon versus operational carbon. And it reduces construction cost, which is great synergy.

School architects can extend the strategy of reducing materials to the interior finishes, too. Polished concrete floors instead of carpet and resilient flooring are one example. Exposing structure overhead can reduce the material used for ceilings. We want to find the balance between functional needs, like acoustics, with the reduced carbon and cost advantages of doing more with less.

Bassetti tracks the embodied carbon of each project through the multiple phases of design using a tool called Tally. Tally plugs into Revit, the building information modeling software used by many architects, and assigns embodied carbon totals to the material quantities generated by Revit. By tracking each project, Bassetti can compare different embodied carbon strategies and intends to refine its approach with each project. The first step is to track the data.

CARBON MATERIALS

The area of practice experiencing the most development and change is the realm of material selection. More and more manufacturers and suppliers are providing environmental product declarations, known as EPDs, which quantify the life-cycle impacts of a product from extraction to end of use, including embodied carbon. EPDs allow architects to compare products and then make informed decisions about embodied carbon. A new tool developed in association with UW's Carbon Leadership Forum and operated by the nonprofit Building Transparency is EC3, the Embodied Carbon in Construction Calculator. Architects can use EC3 to compare

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CARBON EMISSIONS

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product EPDs against each other and against industry baselines.

Bassetti is using EC3 when specifying products and in tracking embodied carbon during construction. It's transformational to have access to that kind of data.

CHOOSE WOOD

The single biggest material choice architects can make is in the building's structural system. Choose wood. By selecting either a mass timber or light wood framing system instead of steel, architects and structural engineers can make a big reduction in embodied carbon. The design for Mercer Middle School in Seattle, for example, uses a combination of mass timber and light wood framing. The project has an embodied carbon intensity of 22 kilograms CO2 equivalent per square foot, compared to the 35 kgCO2e/sf of a median school. A hybrid steel and wood approach can still result in reductions. At Fairview Middle School in the Central Kitsap School District, the project uses a steel column and floor structure combined with a mass timber roof structure, resulting in an embodied carbon intensity of 28 kgCO2e/sf, a 20% reduction from the median.

At Fairview Middle School in the Central Kitsap School District, the project uses a steel column and floor structure combined with a mass timber roof structure.

It's important to consider where the wood comes from, however. Specifying responsibly sourced timber ensures those carbon reductions are realized.

SPECIFYING CARBON TARGETS

The information and data now available about the embodied carbon of products allows architects to set carbon targets for the materials they specify. The first material Bassetti has used this approach for is concrete. As mentioned above, concrete represents the single largest source of embodied carbon on most school projects — up to 50% of the total. Working with structural engineers and the baselines developed by the Carbon Leadership Forum, Bassetti set maximum kg of CO2 per cubic yard for each strength of concrete, and allows the supplier to meet the target through their choice of multiple factors, including cement replacements like fly ash, cement type, water ratio, etc. Recent projects have shown surprisingly successful results. On the Multiple Pathways to Graduation building for Portland Public Schools, concrete mix designs achieved 35% to 60% reductions from the CLF baselines.

In conclusion, myriad measures can be taken to reduce carbon emissions of our school buildings, from the reuse of an existing building to careful material selection. We can all play our part by sharing our discoveries as we uncover them.

Kristian Kicinski is an associate principal at Bassetti Architects and the firm's director of sustainability.

CENTERING COMMUNITY FOR A TRANSFORMATIONAL RESULT

McGranahan created a process to lift up the collective experiences and expertise of the community.

BY SHONA BOSE & BENJAMIN FIELDS
MCGRANAHAN ARCHITECTS

The built environment sits at the intersection of creativity and justice. How do we build a world together that serves the needs of all, and who gets to be involved in the planning process? Many public institutions are rethinking their relationships to the vibrant communities they serve, particularly those who have historically been marginalized. Each new endeavor is an opportunity to right injustices, offer a degree of healing, and center the wisdom of those less seen or heard.

In 2020 the city of Tukwila, a majority-minority community with a large immigrant and refugee population, identified the need for an intergenerational center to serve adolescents and older adults. The community recognized that many teens and older adults would thrive with culturally relevant programs providing opportunities for engagement, education, and support.

Our project team sought to move beyond transactional relationships by creating a process to lift up the collective experiences and expertise of the community. This transformational process centered community as expert, allowing the project team to play a supportive role in applying the community's skills and knowledge to amplify their concepts, ideas, and aspirations.

The following key principles of our process were foundational in building a vision for the new Tukwila Teen & Senior Intergenerational Center:

1. Establish an appropriate timeline and revisit as necessary. Transformative community engagement takes time. The full process took nearly a year, with three months of crafting the process, about seven months of community engagement, and two months to complete the report and deliver it to City Council, who had been receiving regular updates throughout the process.

Community Champions vote on the collected space types gathered from wondering "What is at the heart of a Tukwila Teen & Senior Intergenerational Center?"

IMAGES COURTESY OF MCGRANAHAN ARCHITECTS

2. Assemble a responsive project team and establish decision makers. To build with community, we can only build at the speed of trust. Transparency builds trust. Community needs a responsive and accountable project team guiding the process, and community must know who the final decision makers are to understand their agency in the process.

The project team consisted of the deputy city manager/co-project manager, Rachel Bianchi, the city's teen center director/co-project manager, Nate Robinson; SOJ project managers experienced in the Tukwila community; community engagement advisors, Bookie Gates, Gates Ventures Group, and W. Tali Hairston, Equitable Development LLC, with the expertise and lived experiences to bring meaningful insights to the process; and a multi-disciplinary team of design professionals including McGranahan Architects, Site Workshop, and Jacobson Consulting Engineering. Together we created an engagement plan, including progressive implemen-

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Community Champions work in break-out groups to organize the spaces envisioned from the eight questions small group engagement and prior Champion workshops.

COMMUNITY

CONTINUED FROM PAGE 18

tation of activities based in and responsive to consistent community input, that centered the relationship between the city and the community.

The project team clearly communicated that community input was advisory to the City Council. Community was encouraged to "dream big" as they lead the team in studying site alternatives and imagining what activities would be offered, while understanding that City Council would make the final decision. Community members learned about the design and construction process and advocated for themselves at council meetings.

3. Build community awareness and develop direct community relationships. The project started with a goal to reach out to as many residents as possible. The objective was to create relationships that would not only sustain the subsequent funding, design, and construction phases, but would also establish an already thriving culture for the new facility when it opens. To do this we conceived of three phases of community engagement — a robust initial outreach through many small group meetings, in-depth Champion workshops, and full-community verification steps.

For the initial outreach, the project team brainstormed over 50 community organizations to establish relationships with. Conversations were guided by eight questions to provide context and gather community stories around an intergenerational center and ask if there were any other concerns the city could address.

These small group meetings allowed the city to establish authentic relationships where residents were able to learn about the new project, provide their lived experience, and understand how to further engage with their city officials. The project team collected hundreds of data points from these conversations that were distilled into nine different categories: Diversity, Learning, Activities, Atmosphere, Wellness, Food, Outdoors, Exercise, and General Thoughts. These categories became the basis for the Champion workshops phase.

4. Center community as leaders and experts. The city identified 23 Community Champions, representing the broad diversity of Tukwila, to develop the initial small group engagement. Champions were asked to represent, engage, and advocate for the wants and needs of all Tukwila. Champions were compensated for their time and contribution.

A Community Champion speaks with co-project manager Nate Robinson about the pros and cons at a potential site location for the Intergenerational Center.

Each meeting or workshop was conducted on three different days and times to accommodate the schedules and personal commitments of the Champions. This added complexity to the planning and required more time, but the inclusion of all perspectives was invaluable in building a vision.

The visioning process was intentionally iterative. Each engagement with Champions voices formed the foundation for each subsequent step. Each meeting began with the confirmation, "Did we hear you?" and "Does what we have collected resonate with you?" Only when we had recorded observations and concerns, and had received affirmation, would we continue. Through a series of workshops, the Champions collected and prioritized spaces, relationships, and activities that formed the basis for the full program included in the project proposal to the City Council.

5. Sharing information and key decisions with community for verification. The project team clearly articulated expectations, project understanding, community responsibility, and next steps at every engagement opportunity. The city employed a variety of communication methods to report and verify the information gathered with the whole community: a website, survey, and mailer in multiple languages and several in-person and virtual town hall meetings where the overall Tukwila community added their voice to the mix. Key decisions were consistently shared back in a timely manner by the city and supported by the cultivated network of relationships that were formed or strengthened during the community engagement process.

Both large and small group community meetings allowed deeper conversations between the project team and the community, leading to more authentic relationships and a deeper project understanding on both sides. We held multiple sessions of each meeting or workshop to accommodate a variety of schedules among community members. In all, the city led 68 meetings through the three stages of engagement — initial outreach, Champion workshops, and verification steps.

RESULTS

Transformational community engagement requires a level of care, empathy, commitment, and follow-through that must consider the lived experiences of those we wish to serve. For many in marginalized communities, participation in a process that asks about their needs is a reminder of injustices, past and present, that they have experienced. Asking for them to be vulnerable enough to share their aspirations is a reminder of times their hopes have not been met.

Participants offered their experiences of joy in their cultures, pride in their diversity, and their connections as a community. The community expressed that they felt a sense of partnership as they engaged in this inclusive process with the project team. The relationships formed are authentic and community members expressed they felt heard even through challenging conversations.

For the Tukwila Teen & Senior Intergenerational Center this process has been a first step. We hope to inspire others to build upon the meaningful lessons that we took from this project as they conceive of future projects that serve their communities. Each new project holds unique opportunities to enhance and strengthen "institution to community" relationships. By committing appropriate time and resources to this process, and by developing a transformational mindset towards community relationship building, the city of Tukwila offers an example of design engagement for public institutions to thrive.

Shona Bose is the director of environmental responsibility and a staff architect, and Ben Fields is a partner and project designer at McGranahan Architects.

BUILDING RESILIENCY AT UNIVERSITY OF WASHINGTON

Renovating the school's unreinforced masonry structures for seismic safety.

A renovation effort focused on URM building safety is underway at the University of Washington. Recognizing the Seattle region's risk of earthquake damage to the city's vulnerable structures, the university is undertaking a multiphased project to improve the seismic resilience of 25 unreinforced masonry (URM) buildings on campus, increasing time for occupants to safely exit structures in the event of an earthquake.

BY KYLE KNAPP
CLARK CONSTRUCTION GROUP

Currently, more than 1,100 URM buildings are located in Seattle, with thousands more across the state. The walls and parapets of these buildings are uniquely vulnerable to collapse in an earthquake due to the nature of their construction. Seismic retrofitting focuses on structurally absorbing energy, adding strength, and allowing buildings to move with forces rather than simply break apart. This includes connecting brick walls and parapets to roofs and floors to increase earthquake resilience and enable the preservation and continued use of these iconic structures.

AHEAD OF THE CURVE

The University of Washington, the city of Seattle Department of Construction and Inspection, and the Seattle Department of Neighborhoods (SDON) Landmarks have a shared interest in improving the structural integrity and preserving historic features of the campus buildings. UW is leading the way in the Pacific Northwest ahead of regulations for retrofitting URM buildings in the state. In 2018, Clark Construction began its partnership with the university to supports its goals. Since that time, Clark has helped UW renovate the parapets, facades, and unreinforced masonry of 11 campus buildings. Currently our design-build team, which includes Mitchun and Degenkolb, is under its fourth phase of design and permitting.

Performing these structural upgrades while preserving the historic character of the buildings on campus is a delicate process. With expertise in seismic retrofits dating back to the 1994 Northridge Earthquake in California, Clark's experience includes the award-winning upgrades to Los Angeles City Hall and renovations to 18 buildings in nine locations for Catholic Healthcare West.

For Eagleson Hall's renovation, Clark added structural trusses that mirror the original Gothic trusses while protecting the structure from damage.

PHOTOS COURTESY OF CLARK CONSTRUCTION GROUP

RETROFIT DESIGN

For work on Eagleson Hall, a two-and-a-half-story Gothic structure on the Seattle campus that was constructed in 1923 and named a historic landmark by Seattle's Landmark Preservation Board, planning was key. The building's landmark status meant that any improvements required approval by the UW Design Review Board and SDON Board to ensure the exterior and interior historic fabric of the building was preserved.

To better visualize the proposed improvements, our team performed a high-definition laser scan of the building to document existing conditions and created a virtual model to show proposed changes. The use of this technology enabled a collaborative review of the planned renovations and the process by which our team would protect the historic structure.

PRECISION CONSTRUCTION

Delivering these upgrades required precision in the field. During Eagleson Hall's renovation, our team first installed two brace frames — one located

RESILIENCY — PAGE 22

RESILIENCY

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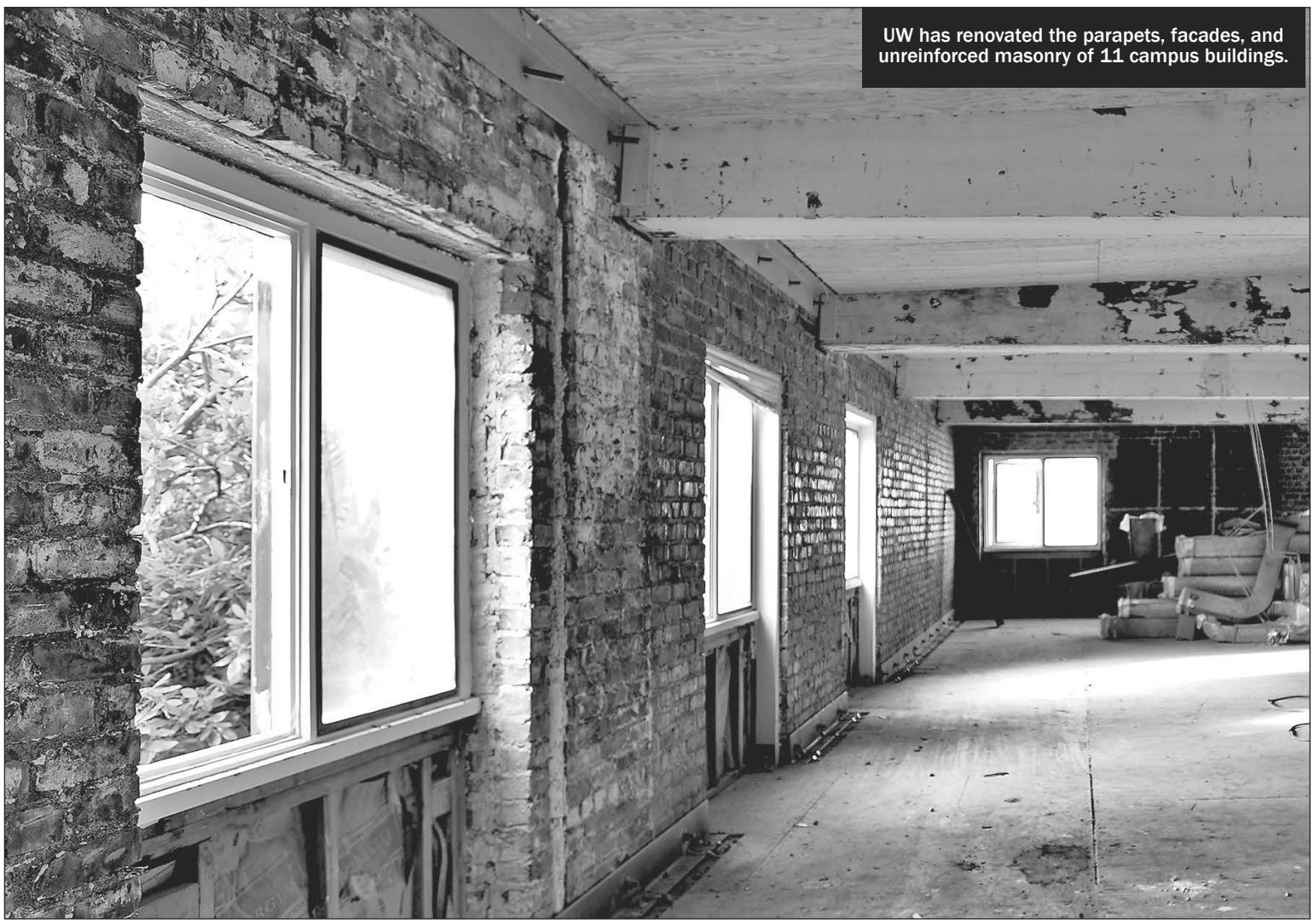
between the Great Hall of the original structure and the gym addition, and the second along the length of the building on Northeast 42nd Street. In addition, we bolted the floors of the building to the walls, careful to protect the architectural facade.

The roof load of the building's Great Hall was then supported with structural trusses which carefully sandwich its original Gothic trusses, mirroring these architectural features while protecting the structure from damage. Because the existing structure had shifted over time, each truss was custom built to fit its unique location. The trusses were delicately hoisted into place from inside the building using specialty hoisting equipment with sufficient lifting capacity that was small enough to fit in the space. The effort successfully preserved the historic character of the landmark while delivering critical safety upgrades.



UW has renovated the parapets, facades, and unreinforced masonry of 11 campus buildings.

BUILDING ENHANCEMENTS

Although the scope of our work focused on seismic upgrades to UW's campus buildings, the process has yielded additional benefits. Our team enhanced finishes in locations where work was performed, optimizing value for the university. In addition, the university requested that the team explore upgrading specific components of the HVAC and telecommunications systems, since MEP components needed to be temporarily removed or relocated to facilitate the installation of seismic components. Focusing on these areas of the building, we designed a solution that increased thermal comfort.

As this multi-phase project progresses, our design-build team continues to apply lessons learned from one university building to the next, streamlining design details and material selection to create significant efficiencies across multiple buildings.

Kyle Knapp is senior project manager of Clark Construction Group.

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