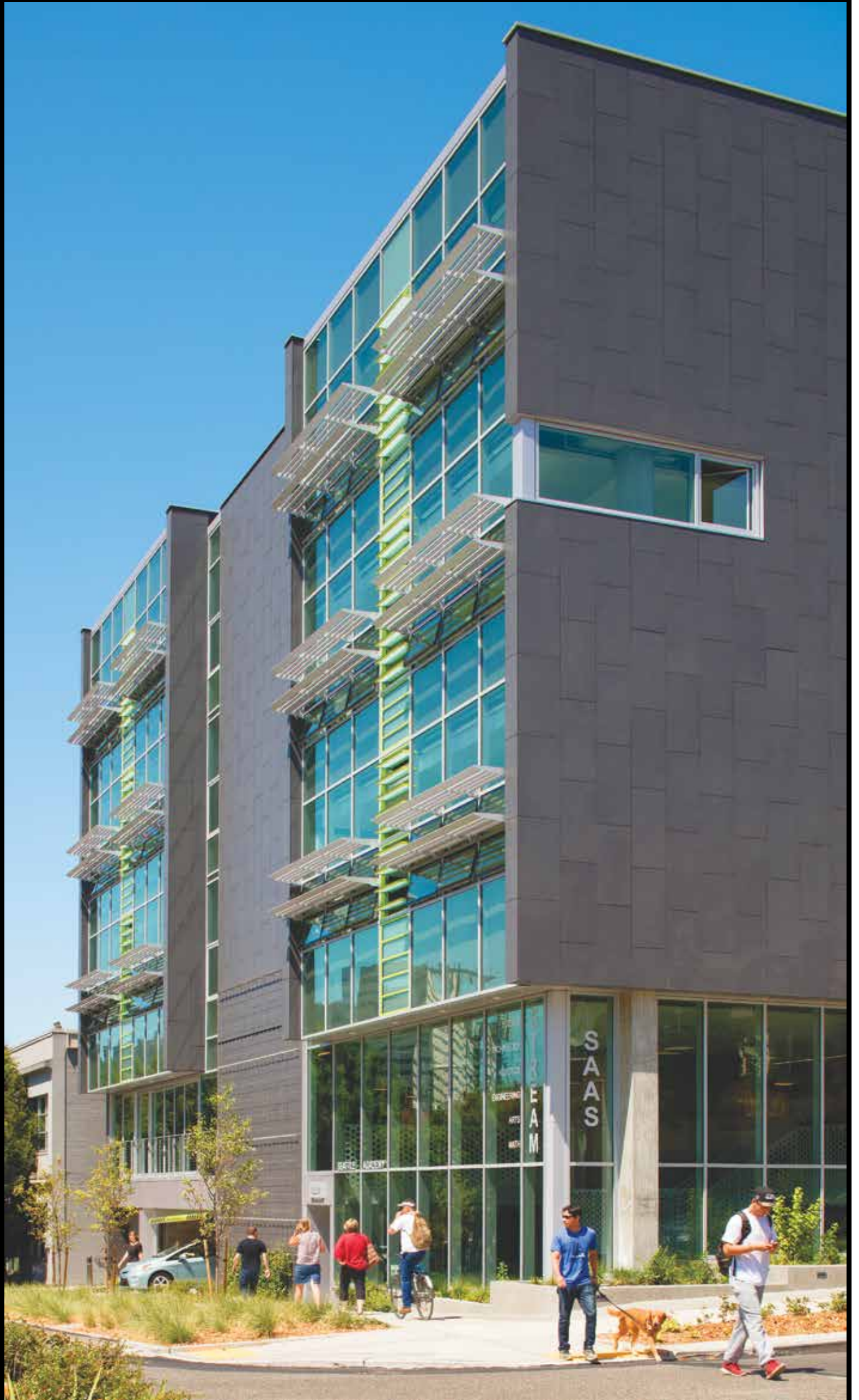


# SOON CONSTRUCTION



August 20, 2015



# YOU CAN HAVE A SAFE SCHOOL THEATER — EVEN ON A BUDGET

A few safety improvements can make a big difference in reducing the risk of injuries on stage.

It's no secret that operating budgets for school districts are becoming tighter. As school administrators look for ways to stretch decreasing dollars, many districts have been forced to significantly reduce, or even eliminate technical theater managers/teachers.



BY K. PAUL  
LUNTSFORD  
PLA DESIGNS

For many secondary schools, the drama teacher is actually an English or Western lit major pulling double duty. In

some cases, the teacher may have minored in theater at college, but not technical theater.

For most school districts, having a dedicated technical theater expert on staff is an unaffordable luxury. It is certainly possible to merely eliminate all technical theater elements that are inherently risky, resulting in a useless box where no one learns and performances are bland.

A more realistic design goal is to identify practical, cost-effective design solutions that can help mitigate risk and still deliver the expected level of educational performance.

In April, students at a high school in Westfield, Indiana, were performing the closing number of the musical "American Pie." Several students were dancing above makeshift decks that had been installed above the orchestra pit when the decking suddenly gave way and 17 students were injured as they fell into the orchestra pit below.

An investigation into the collapse determined that a part-time district employee had removed the orchestra pit covers and supports that were provided when the building was constructed and replaced them with plywood decks of his own design, believing them to be stronger than the original units. A lack of professional knowledge, combined with zeal, resulted in bruises, sprains, a few broken bones and, thankfully, no deaths.

Theater safety is a result of equal parts good design and proper stage management. There are solutions and products available that make proper management of these spaces easier for those without a strong technical theater background.

In order to understand where and how to apply these solutions, one must understand where most accidents or injuries are most likely to occur: stage rigging sets, catwalks, and stage extension platforms.

## Stage rigging sets

The most common mishap that happens in educational theater is called a "runaway rigging set."

First, a quick primer on stage rigging: When you see something move up and down on a stage during a show you are seeing the results of a stage rigging set. A typical stage rigging set consists of a long piece of steel pipe known as a "batten" that is attached by several aircraft cables routed through pulleys to a counterweight "arbor."

The arbor rides up and down on a series of steel bars. When the arbor goes down, the batten goes up, and vice versa.

Attached to the batten can be scenery, stage lights, electrical distribution, curtains or even large acoustic reflectors. The key is keeping sets in balance.

Whatever the weight of the object attached to the batten, the same amount of weight must be placed on the arbor. This is done by adding steel counterweight "bricks" to the arbor. The arbor is operated by a rope that is captured by what is known as a rope lock. The goal is to have balance so that the rigging set only moves relative to pulling on the rope.

When a rigging set is not in balance, a runaway set can happen. When out of balance, a student disengages the rope lock, allowing the arbor (weighing more than the batten) to come crashing down.

Usually this happens with such force that the arbor bends and the counterweight bricks fly out. Any student near the arbor may be struck by 22-pound bricks of steel.

There is more. Now, the arbor weighs much less and the batten is heavy in the air. Thus, the batten and attached scenery now crash down to the stage floor and flatten anything below.

The best case result of a runaway set is damage to school property. The worst case is severe injury or even death.

One way to mitigate the risk of a runaway set is to design a system of motorized rigging hoists in place of counterweight sets. Most motorized rigging sets



Stage deck extensions like this one at Bellevue High School should be professionally designed and built.

PHOTO COURTESY OF PLA DESIGNS

eliminate the need for counterweights, and have controllers that sense loads and automatically shut down when more or less weight than what they are anticipating is detected on their battens.

While it may not be financially viable to motorize every rigging set on a stage, identifying the sets whose loads change often, such as stage electrics or scenery sets, and motorizing those sets is a worthwhile investment. Manufacturers of stage rigging hoists have introduced products specifically suited and priced for

educational theater, and whose controls offer levels of protection and user interfaces that are accessible to those without an undergraduate degree in technical theater.

Simply put, no counterweight equals no risk.

## Catwalks

Another area where accidents typically happen is the catwalk.

Most building codes exempt lighting catwalks ("platforms") from having any guards or railings. From a risk manager's per-

spective, this is insane.

A common solution offered up for secondary school theater catwalks is to provide an abundance of guards. Unfortunately, this actually aggravates risk since the student must climb over the guards to mount and aim the stage fixtures.

A safe, workable and practical solution involves the use of two guard pipes and a chain segment. While it is still advisable to consider deployment of fall-arrest gear on catwalks, this



# HOW TO MAKE EXISTING SCHOOLS HEALTHIER, MORE EFFICIENT

Schools need to consider how performance upgrades will affect the comfort of teachers and students.



BY LAUREN FRUGÉ & CLINT HAWN

MCKINSTRY

For each high-profile new school built to exacting sustainability standards, there are dozens of existing schools that continue to serve Washington's students.

That's why designing and building efficient schools isn't just about the projects that make headlines. It's equally (if not more) important to find ways to ensure what we already have operates more efficiently and effectively.

There are three ways to improve energy efficiency in existing buildings: capital improvement projects, such as investing in energy-efficient heating and cooling systems; operational changes, such as adjusting heating and cooling temperatures and occupancy schedules; and behavioral modifications, such as student

engagement in energy reduction. When all three energy performance methods come together, schools and districts can operate at top efficiency.

However, efficiency isn't everything. Schools also need to think about how these changes affect the learning environment.

Research shows that the school facility affects students' ability to learn. Factors such as air quality, levels of thermal comfort, daylight, noise, overcrowded classrooms and the condition of the school building all impact the learning experience — and can either help or hurt student performance.

How, then, to balance the need for efficiency with the requirement for a healthy learning environment?

## Capital improvements

A healthy, thriving school is a dynamic environment dependent on many interconnected building systems. These systems need to excel today, tomorrow, and — with the threat of budget cuts always looming — for another 20 years. Districts need to ensure that they have quality, reliable systems in all of their schools, both new and existing.

For example, Mukilteo School District and their energy services



Mukilteo School District replaced parking lot lights with LEDs at its schools, including Discovery Elementary in Everett.

IMAGE COURTESY OF MCKINSTRY

partner, McKinstry, have replaced a number of aging heating, cooling, ventilation and lighting systems over the past five years with highly efficient, modern systems. Additionally, Mukilteo replaced their parking lot lights with LEDs, which are more efficient, last longer and improve light quality. These lights also help improve aesthetics and safety, and deter vandalism.

Mukilteo School District doesn't just decide which systems to replace and when based on cost and payback; they also consider exactly how it will impact the learning environment. This includes ensuring there is the right amount of quality air ventilation and that there is the right amount of lighting in all the classrooms.

Cumulatively, these projects have saved the district over \$2.5 million in utility expenses, and the district has qualified for millions of dollars of grants, rebates and incentives.

## Operational changes

A school can have the best building systems money can buy, but they don't do any good unless they're operated properly.

The majority of buildings are operated in a way that uses more energy than necessary and run equipment longer than needed. Schools are no different. Operational changes that accumulate over time place added stress on aging systems and reduce overall efficiency.

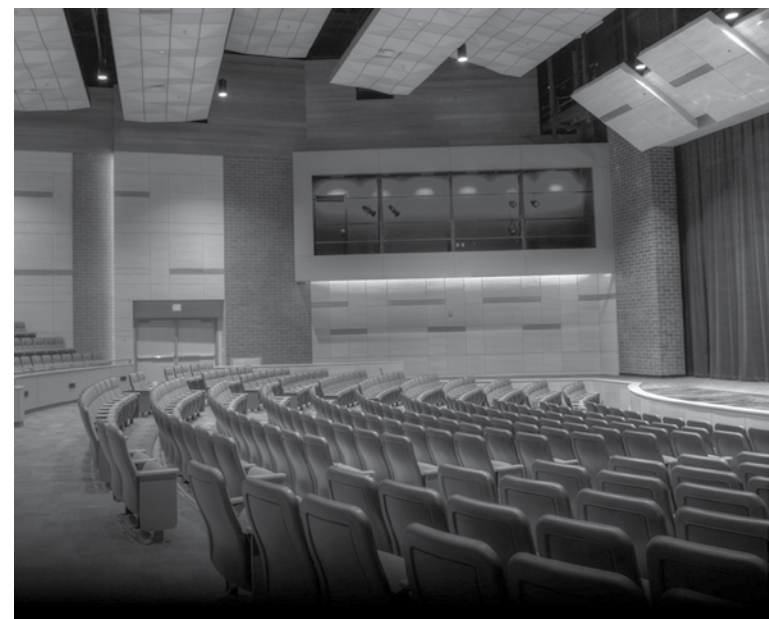
Lake Washington School District has instituted a number of opera-

tional changes across the board that help them maintain an efficient and comfortable learning environment. For example, the district and their energy services partner McKinstry have installed "alarms" on critical equipment that alert the teams when the systems are running outside of

their expected schedule. They also monitor their energy consumption with real-time data, and get automated alerts when it goes outside of the expected parameters.

Training and ongoing education

MORE EFFICIENT — PAGE 12



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## ON THE COVER

The new STREAM building for the Seattle Academy of Arts and Sciences focuses on science, technology, robotics, engineering, arts and mathematics. The Miller Hull Partnership is the architect and GLY Construction is the general contractor. PHOTO BY LARA SWIMMER

## DJC TEAM

SECTION EDITOR: JON SILVER • SECTION DESIGN: JEFFREY MILLER  
WEB DESIGN: LISA LANNIGAN • ADVERTISING: MATT BROWN



One way to integrate a new residence hall with the existing campus is to include features everyone can enjoy, such as shared recreation space. This example is from Montana State University.



RENDERING BY NAC ARCHITECTURE

# BELLEVUE COLLEGE WILL OPEN ITS FIRST ON-CAMPUS HOUSING IN 2018

The former community college is building new housing to provide an affordable alternative to high Eastside rents.

When Bellevue College dropped “Community” from its name in 2009 and started offering four-year degrees, it also started planning for on-campus housing.

With a growing population of international students — recent statistics show that Bellevue College enrolls over 1,700 international students annually from more than 70 countries — coupled with the rising cost of rent in the surrounding Eastside neighborhood, there was an obvious, immediate need to



BY RON VAN DER VEEN  
NAC ARCHITECTURE

provide on-campus housing for students. And with Bellevue College’s commitment to inclusion and global awareness, a progressive live-learn community was the answer.

Currently in design, the first phase of Bellevue College’s new student housing development will deliver a 350-bed residential community that is scheduled to open mid-2018.

## Live-learn housing

It is no secret that a strong connection exists between students’ experiences living on campus and their overall academic performance. This knowledge, coupled with shifting demographics that are bringing more historically underrepresented students to college, has sparked the need for new models in student housing that accommodate the evolving student population.

As a result we’re creating student-centric live-learn housing communities that provide more than just a room to sleep in. Acting like small neighborhoods rather than traditional dorm rooms, these communities allow open communication, spontaneous socializing and academic collaboration to collide.

By blurring the line between living and learning, students are given a holistic educational experience where they connect learning across multiple contexts. They also feature a wide variety of resources, programs and activities that support the interests of their residents, keeping students engaged and committed to their academic achievement.

This shift in student housing

Washington State University’s Northside Residence Hall has a student recreation lounge off the lobby.



PHOTO BY FRANK OOMS

design couldn’t come at a better time for Bellevue College, which is embarking on its transition from a primarily commuter campus to a flourishing, multicultural residential college.

“Bellevue College is eager to make the transition to a resi-

dential campus,” says Bellevue College President David Rule.

“As the college has grown to meet the educational demands of the Eastside, affordable housing has been a clearly identified need. Building and offering residential life options will

enhance BC’s students’ abilities to engage in their educational experience.”

## Purposeful design

NAC Architecture’s student housing team has decades of



experience creating these thriving, student-life communities for colleges and universities across the country, particularly those that are introducing student housing on campus for the first time.

Lauren Scranton, our in-house director of educational research and development, leads our firm's exploration into how we can holistically improve the student experience on campus and how that informs the architecture. Scranton is currently working with our design team and Bellevue College to help them develop the progressive live-learn campus community they desire.

"Physical space plays a really important role in the retention and persistence of students, mostly because physical features have the power to encourage or limit behaviors," Scranton says.

"With the wealth of scholarship that points to the 'residential impact' on students' social and emotional well-being and academic achievement, we must be intentional and purposeful in our design to create a space that enhances students' college experience.

"What this means is Bellevue College would be able to provide educationally purposeful programming in the residential halls that's grounded in scholarship and sends a positive message of achievement. This might look like inviting faculty members to

the residence hall to promote faculty mentorship, or bringing in tutors to increase access to instruction in basic study skills, or organizing a social program to build community.

"Designing the space so that it encourages this kind of behavior, instead of limiting it, is our goal."

### Creating community

But how do you transition a campus that previously had no residential facilities to an active student neighborhood? These developments need to integrate with the existing campus in a way that connects residents to the academic core. By including features such as shared indoor and outdoor recreation space, dining services and study resources, these live-learn residences provide a welcoming campus amenity, encouraging students from all across campus to gather and socialize.

Bellevue College commissioned a feasibility study that confirmed the need for on-campus student housing. Building off of the study, our team focused on the qualitative aspect of student housing, identifying the considerations that were most relevant to future residents.

A good amount of time was spent on campus, conducting extensive interviews with students about what they were looking for in a campus resi-

dential community. Among the many things that were important to them, students were most excited about eliminating their commute from home to campus, the ease of access to academic resources outside of regular classroom hours, and the idea of being part of a student community that establishes a sense of belonging and provides an extensive support network.

As we continue to collaborate with Bellevue College to develop their student residence, we are focused on providing opportunities for students to connect, share their cultures, and create their own sense of place. By working closely with college administrators, students and other stakeholders, this new residential development will focus on the needs of the global student population that Bellevue College serves.

The result will be an inclusive student community, transforming the campus into a living, breathing 24/7 neighborhood that offers a sense of security, promotes the well-being and academic achievement of students, and offers a place where individuals can connect, thrive and grow.

*Ron van der Veen is a principal at NAC Architecture, with a career dedicated to higher education, student housing and sustainable design.*



Shared common areas are important components of student housing. Students use this lounge at the University of Arizona to study and socialize.

PHOTO BY BEN BENSCHNEIDER

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# SIX TRENDS SHAPING THE FUTURE OF CAMPUS DESIGN

Northwest schools are changing because of technology, shifting demographics and new ways of learning.

As our region continues to grow, colleges and universities are facing a shifting economic, sociodemographic and environmental climate.



BY BRODIE BAIN  
PERKINS + WILL

To adapt, many institutions across the Pacific Northwest are taking a strategic approach to campus and facilities planning to ensure they have spaces, both indoor and out, that address recent evolutions in teaching, learning, research and community engagement.

Trends include:

- **An increasingly diverse student base.** From returning and first-generation students to international and students entering directly from high school, institutions are addressing a more complex student body than ever before.

With one of the most diverse student populations in the state, Bellevue College accommodates a wide range of preparation levels and learners.

The institution is undergoing a campus master plan, including assessing how well the physical campus currently and in the future will address its varied student needs. The answers will inform a campus plan that sets project priorities as a reflection of college priorities.

- **New ways of learning.** Recent advances in brain science and learning research provide insights into how people learn and the many different styles of learning.

“Active learning” in the form of hands-on, project-based work that includes peers as both co-learners and teachers is one of the most effective. This calls for a different approach to coursework and a different type of classroom.

At Seattle Pacific University, the move toward active learning has changed some of the course curricula and the evaluation of teaching space campus-wide. While some classrooms will continue to be dedicated to a lecture format, others are planned with a lower occupancy with movable furniture, technology-based groupings and display/projection



Informal learning spaces offer students the chance to collaborate in and out of the classroom.

PHOTO BY TIM GRIFFITH, COURTESY OF PERKINS + WILL

throughout the room.

- **Doing more with less:** Faced with reduced funding and pressures to lower the overall cost

of education, both public and private institutions are encountering a future of having to do more with less. Adaptive reuse can be one of the most effective

strategies to reducing capital costs, as well as one of the most sustainably minded.

After careful planning, Central Washington University has suc-

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Outdoor environments also help students learn.

PHOTO BY ROBERT CANFIELD, COURTESY OF PERKINS + WILL



cessfully garnered state funding to transform a vacated student union building that sits at the center of campus into the campus communications and technology center. Part of this achievement was the result of the university's approach to planning, which includes diligent efforts to clearly tie project requests with the university mission and vision, the long-term campus plan, and current and future needs.

• **Integration of technology:**

Technology is expanding opportunities for access to online lectures, digital immersion and collaboration between faculty and students in remote locations. When content is gleaned from an online experience, the time spent in the physical classroom and on campus becomes even more critical to maximizing the experience and interaction among students, faculty and staff.

A Digital Classroom Building at Washington State University is planned to be a high-performance learning environment that leverages the range of technologies and experiences that promote deep learning and student engagement.

This will be accomplished with a technology-rich building that showcases state-of-the-art approaches to learning, yet promotes engagement and community with numerous open, informal learning spaces and classrooms.

This computer classroom is designed so students can work alone or in groups.



PHOTO BY BEN RAHN/A-FRAME PHOTOGRAPHY, COURTESY OF PERKINS + WILL

• **Blurring the boundaries:**

Teaching, learning, research and community engagement are at the heart of most academic institutions. The campus and its edges are where all can come together.

The importance of interdisciplinary work across learning, research, community and industry engagement is increasing, and institutions are developing deliberate ways to collaborate between disciplines and constit-

uents. Interdisciplinary programs like environmental studies and multidisciplinary research such as bioengineering help to address some of society's most pressing concerns.

Similarly, blurring traditional

program and physical boundaries both within the campus and at the edges strengthens the student and faculty experience by bridging education and research

SIX TRENDS — PAGE 11

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# A 'THIRD PLACE': WHERE STUDENTS CAN BE THEMSELVES

Kids need spaces that aren't strictly academic or focused on activities, where they can socialize and feel a sense of belonging.

Federal Way voters approved a capital levy in 2012 to replace Federal Way High School.

The original building was constructed in 1929 as an elementary school. That building was eventually demolished and replaced by the current high school building in 1936.



BY BARNEY MANSAVAGE  
SRG PARTNERSHIP

The structure evolved over time, with a collection of additions that occurred through 2001. Due to major deficiencies in the existing building's performance and its inability to support evolving instructional needs, the school district decided that a new building for the school was the best and most cost-effective solution.

The new high school, designed by SRG, will replace the aging facility with one on the same site that creates a sense of pride among students and the Federal Way community.

## Design goals

The design team worked with stakeholders to create outstanding learning and activity spaces that will accommodate a diversity of uses for the entirety of the building's 50-year service life. The resulting environments can be modified over time, allowing a sense of ownership and encouraging experimentation so that learning happens all the time and everywhere — not just in a classroom.

Three fundamental principles guided the design process:

- **Connecting with history and culture.** Honoring its history as the first institution of learning in the area, the building must support Federal Way Public Schools' mission to educate a hugely diverse and changing population of students and prepare them for life after high school.

- **Placemaking.** Federal Way High has been a significant place both for Federal Way students and the larger community since it was first built. The new building must continue to strengthen this role by creating a strong sense of place, both inside and out.

- **Flexibility.** Change is constant, both day-to-day and long-term. Every day, varying needs depend on the building's inherent flexibility; pedagogies change and community values evolve to seek different educational outcomes.

In the face of inevitable change, the building must be able to

## FEDERAL WAY HIGH SCHOOL

### Location:

South 308th Street and Pacific Highway South, Federal Way

### Size:

237,000 square feet

### Completion:

2017

### Cost:

\$71 Million

## PROJECT TEAM

### Owner:

Federal Way Public Schools

### Owner's project manager:

Greene Gasaway Architects

### Architect:

SRG Partnership

### General contractor:

SpeeWest Construction

### Structural engineer:

Coughlin Porter Lundeen

### Civil engineer:

Sitewise Design

### Mechanical/electrical engineer:

WSP

### Lighting:

WSP

### Landscape architect:

Swift Co.

### Audiovisual/acoustics:

The Greenbusch Group

### Cost estimator:

The Robinson Co.

### Athletic field designer:

D.A. Hogan & Associates

### Theater designer:

PLA Designs

### Food service:

Stafford Design Group

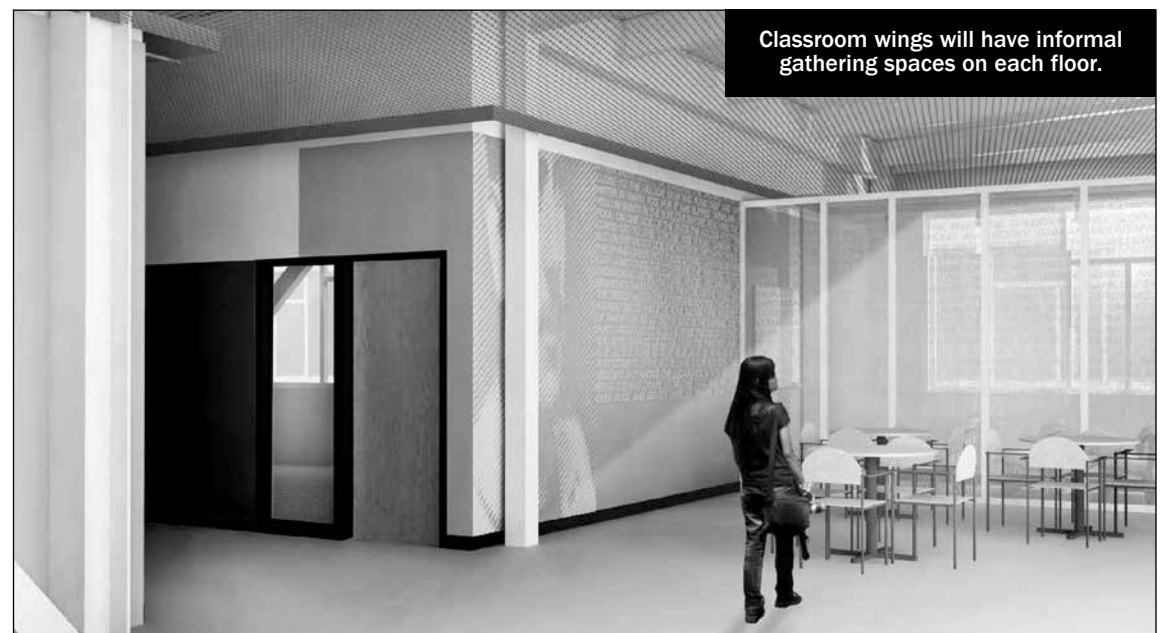
meet the needs of the students, district and community for its lifetime of 50 years or longer. This expectation for change challenged the design team to establish a framework for describing the design problem without relying on assumptions or conventional school planning.



Small-group rooms will be situated next to the library.



The main commons will serve as the heart of the school.



Classroom wings will have informal gathering spaces on each floor.

IMAGES COURTESY OF SRG PARTNERSHIP

So let's look at the outcomes achieved by embracing these principles.

## A sense of ownership

Federal Way Public Schools has been a leader in exploring and adopting pedagogies that

are unconventional or unique, including the small-schools initiative, project-based learning, specialized STEM academies, and community-partnered and self-directed leaning typologies. Their current pedagogical model, Standards Based Education, is at the vanguard of public edu-

cation.

What is initially remarkable about FWHS may be its history in the formation of the school district and even the city. However, its diverse student body and the culture fostered by the high school staff and administration are the true stars.



Outdoor areas can also serve as third places.



Design strategies for the new FWHS included giving students a sense of ownership, space to “see and be seen,” and expanding uses beyond the academic day in a way that provides safety and comfort — a home away from home.

In his book “The Great Good Place” urban sociologist Ray Oldenburg demonstrated how and why “great good places” are essential to community and public life, arguing that what he calls “third places” are central to local democracy and community vitality. In the adult world, if your “first place” is home and your “second place” is work, then your “third place” is where you interact with others in between your first and second places.

Third places have always been evident in engaged human societies. Think of the Roman Forum, open market, public park, local pub, coffee shop and bookstore. Third places are for sharing ideas and forming relationships.

### Learning everywhere

Learning happens everywhere and in many ways. SRG’s design work in educational environments supports this paradigm shift by creating communities of human interaction that facilitate learning, both inside and outside the classroom.

Pedagogical methods and teaching materials are important, but there is also a lens for success that is understood by the level of the kids’ happy and passionate engagement in learning and doing. It is evidenced by a spark of interest in individuals who want to know more: to learn how to learn, not only what to learn.

The new facility is envisioned as a place where any and all modes of interacting in the school experience are encouraged. This creates an ebb and flow between academics, athletics, arts, theater, science, clubs and extracurricular activities,

and allows each to be a place of importance in the school.

### What makes a third place

A major program and planning element of FWHS is the idea of the third place. For students, if first place is their home environment (generally organized by family adults), and second place is their school setting of classrooms, labs, shops, studios, etc. (generally organized by school adults), then third places would be where they engage and interact with their peers and the greater community on their own terms (generally organized by themselves).

Building the best spaces for academic pursuits and even for every specific extracurricular activity is not enough to foster a well-rounded educational experience. Comfortable and engaging in-between spaces provide an informal neutral ground that can bring students, faculty, staff, visitors and the community together. Well-designed, inspiring spaces without specific academic or extracurricular intention send the message to everyone present that they must be valuable, because “this space was made for me.”

Third places are also congruent with the theory of educating the whole child — socially and emotionally, in addition to academically. The SRG design team took the third place concept to heart by allocating specific space in the building program, rather than leaving the development of third places to chance in residual or found spaces.

Specific rooms and areas identified in the new building are literally titled “3rd Place.” They include a variety of student commons zones, new ways to incorporate library functions, and a variety of exterior courtyards.

Some defining characteristics for what might be a third place:

- *Neutral ground:* Occupants

of third places have little to no obligation to be there.

- *A leveling place:* One’s economic, academic or social status does not matter in a third place. There are no prerequisites that would prevent acceptance or participation.

- *Conversation is a main activity:* Although it is not required to be the only activity, the tone is usually lighthearted and playfulness may be highly valued.

- *Accessibility and accommodation:* Third places must be open and readily accessible at any time.

- *The regulars:* Any third place has its regulars that help give the space its tone and mood, but regulars also attract newcomers and help them to feel welcome and accommodated.

- *A low profile:* Not too precious, the inside of a third place is without extravagance or gran-

diosity. Third places are never snobby or pretentious, and are accepting of all types of individuals.

- *The mood is playful:* The tone is never marked with tension or hostility. Witty conversation and frivolous banter are not only common, but highly valued.

- *Home away from home:* Occupants of third places will

‘THIRD PLACE’ — PAGE 11





# THE GRASS IS ACTUALLY GREENER FOR SCHOOLS THAT INSTALL SYNTHETIC TURF

A full-size synthetic field can save up to 1 million gallons of water a year and pay for itself in just a few years.



BY DAVID NASON & NICHOLE ZUGER-CHENEY  
AHBL

ues to encourage more sustainable solutions, synthetic turf fields can be a great option for school districts.

## What to consider

There's no doubt about it, installing a synthetic turf field is an investment. District officials need to be informed of all their options before making the switch, and should consider elements such as maintenance, cost and player performance.

Synthetic turf manufacturers have improved their products considerably, and there are now several options to choose from when deciding what kind of field to install.

The type of turf and infill selected would depend on the field's use — whether it's used for multiple sports or for a specific sport like soccer or baseball. And while synthetic fields have a high initial cost, there are funding options available through grant programs or purchasing co-ops.

Another consideration is schedule. Installation can be accomplished during the summer months, but design and permitting need to start at least six months before installation can begin. Depending on the jurisdiction, permitting can take

Many school districts are embracing the benefits of synthetic turf fields, including lower maintenance and more durable playing surfaces than natural grass.

The Pacific Northwest's rainy weather can do a number on natural grass athletic fields, rendering them essentially useless during the winter months. This, coupled with the high cost to maintain a natural grass field, makes synthetic turf fields a great option for school districts.

Synthetic fields need less maintenance and require much less water. According to a 2011 report by the Synthetic Turf Council, a full-size synthetic field can save anywhere between 500,000 and 1 million gallons of water a year.

As water conservation contin-

South Kitsap High is installing an organic synthetic turf field that can be recycled.

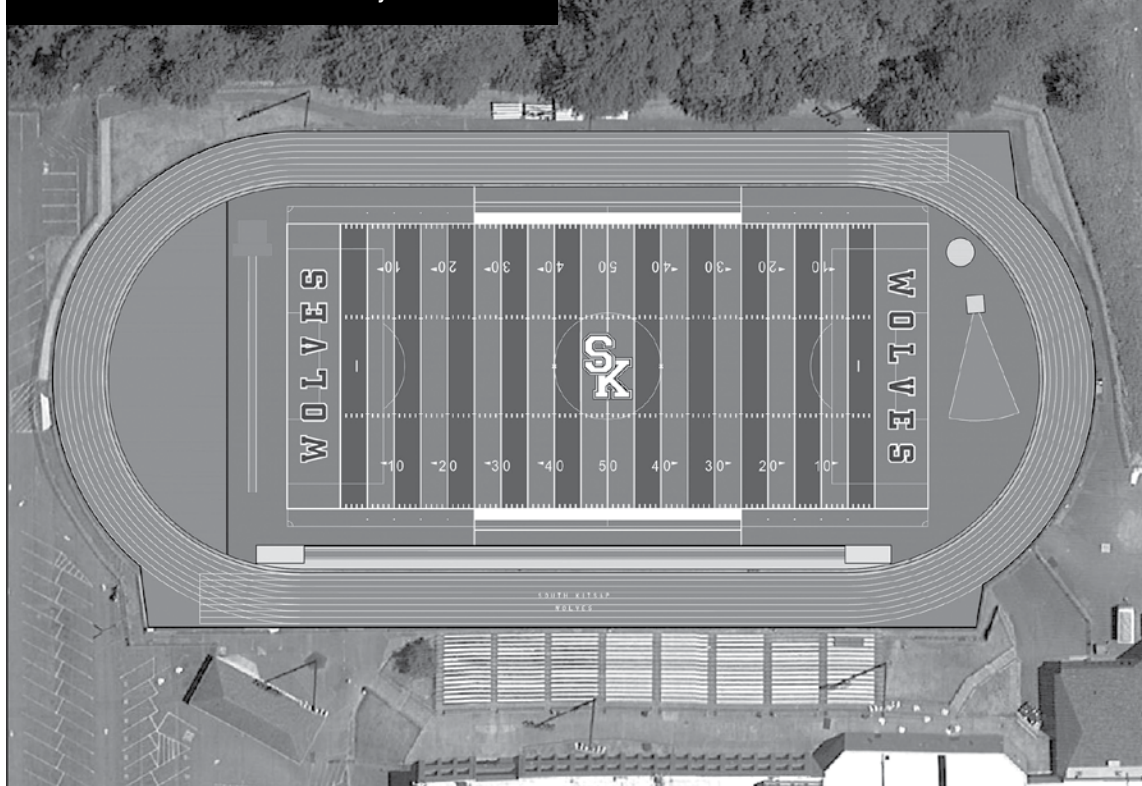


IMAGE COURTESY OF HELLAS CONSTRUCTION

up to three months.

The installation of a synthetic field, or replacement of a natural turf field with a synthetic field, can trigger a variety of permitting requirements and potentially stormwater system upgrades. If existing stormwater facilities exist, the project may only require a simple grade and fill permit. Sites without existing stormwater infrastructure may need conveyance and stormwater control facilities.

The Synthetic Turf Council reports that fields often pay for themselves within three to four years, and can be used for up to 3,000 hours of play per year with no rest time required. You would need three to four natural grass fields to allow for that amount of play.

## Going organic

As sustainable options become more popular and cost effective, there are organic options available.

AHBL, along with Hellas Construction, recently designed a new turf field for South Kitsap High School in Port Orchard. The district chose a Matrix Turf field with the all-organic GeoPlus infill. This will be the first project of its kind in our state, and one of 16 fields in the nation to have this

installed.

The organic infill is made up of coconut fibers and cork, and is more similar to natural soil than rubber infill in that it is less spongy and bouncy, and provides excellent footing, traction and shock absorption.

The life of the field is about eight to 12 years, and when it comes time to replace the field, rather than shipping all the materials to a landfill, the turf can be recycled and the infill can be repurposed. Once removed the infill can be mixed in with any landscape or gardening application, creating another useful life that is both environmentally friendly and sustainable. In addition, it can be spread over existing natural grass fields to enhance these playing surfaces.

## Softness required

Safety and performance are the highest priorities when designing any element of a K-12 project.

A critical component of good field design is confirming a field has the required "softness," or what is technically referred to as G-max. A G-max value indicates how much force a player experiences when hitting the surface. This has become increasingly important as people have become more aware of concus-

sion hazards.

For any synthetic turf system, the depth of the turf, type of infill and use of shock pads below the turf help manage the G-max of the field. Additionally, recent studies by both the NCAA and FIFA have shown the injury risk playing on synthetic turf is no greater than natural grass.

An added benefit of the organic components found in the Hellas GeoPlus infill is that it helps to reduce field temperatures by up to 40 degrees by reducing heat absorption and retaining humidity. Fields that use recycled tires or other types of infill can become much warmer than the ambient air.

## Maintaining the turf

As with any surface, synthetic turf needs to be cleaned and maintained. Maintenance ensures the field's longevity, playing performance and safety. Depending on the turf and infill chosen, a district may need to purchase special equipment to redistribute infill or clean the turf. Service contracts are available to help take care of fields; however, with the right equipment, maintenance can be accomplished with existing facilities staff.

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## 'THIRD PLACE'

CONTINUED FROM PAGE 9

often have the same feelings of warmth, possession and belonging as they would in their own homes. They feel a piece of ownership in the space, and gain regeneration by spending time there.

Embracing what may have been thought of before as simply "between" areas has validated them also as learning realms, and thus as equally important as other program elements, such as classrooms and labs.

The new FWHS building configu-

ration uses solid design principles to create great educational and useful activity spaces that will give all students a sense of pride, belonging and ownership in a safe and secure environment.

It celebrates the history of the site and the community by maintaining and embracing the prominent street edge, and ensuring that "a school along the Federal Way" exists just as it did nearly 80 years ago when it was the only elementary school on this country road.

By our coming to understand and embrace this vibrant history of community, combined with the effervescent school culture that prompted the development of ever-changing third places, all of Federal Way's students — past, present and future — will soon find their own "great good place" on this campus.

*Barney Mansavage is a principal at SRG Partnership and dedicated to excellence in planning and design that inspires learning.*

## SYNTHETIC TURF

CONTINUED FROM PAGE 10

South Kitsap's field will need to be watered because of the organic components of the infill, and the infill of any synthetic turf field will need to be redistributed to ensure playability and safety.

To date there are more than 11,000 synthetic turf fields in the United States. For school districts, these fields help save money and resources, and have provided student athletes with a playing surface that is safe and reliable.

Gone are the days where ath-

letes slip and slide on a muddy field, or worry about twisting their ankle on a field riddled with divots. Today there are clean, safe and reliable options that help these young athletes perform at their best.

*David Nason is project manager at AHBL, and has 17 years of civil engineering experience. Nichole Zuger-Cheney is a marketing professional at AHBL with eight years of industry experience.*

## SIX TRENDS

CONTINUED FROM PAGE 7

with community and industry.

Bates Technical College in Tacoma holds partnerships with local industry throughout the area including apprenticeships on campus, growing health care programs that offer practical experience, participation in downtown Tacoma's revitalization, and programs for students in the Tacoma School District. Such connections are only expected to expand in the future.

The college's 2014 master plan update features strengthened connections between the campus and the downtown neighborhood

while reinforcing college identity. This symbolically, functionally and physically serves to better integrate the college with its partners and surroundings.

Similar approaches can be seen in plans developed for many other campuses, including the University of Washington, Seattle University and South Seattle College.

• **Being flexible, being nimble:** Among all of the trends noted, flexibility in the physical environment and the long-term plan is the most important.

The trends above underscore the ubiquitous nature of higher education's persistently changing conditions and advancements. An institution's planning and design strategy must support a fluid environment where teaching methods, technology and new ideas are continually evolving along with traditional spatial and departmental boundaries, and community and industry relationships.

Both the Seattle University major institution master plan and similar plans for the University of Washington and South Seattle College

identify overall space needs for future growth in the long-term plan, with specific uses and timing kept relatively flexible. This allows for inevitable changes that will occur within the university and college, yet offers a clear physical framework of connected open space, circulation and development within which the campuses can evolve and grow.

The Pacific Northwest is home to some of the finest colleges and universities in the country. These institutions' very nature as forward-thinking, environmental stewards and major contributors to the world

through education, workforce training, research and community support offers vital contributions to us all, including fabulous campus environments.

Thoughtful facilities and campus planning will help to safeguard their future as integral players in the region and guardians of the future of students at all levels of learning.

*Brodie Bain is the campus planning director for the Seattle office of global architecture and design firm Perkins + Will. She has worked on more than 30 campuses around the country.*



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## THEATER

CONTINUED FROM PAGE 2

design solution provides for safety and easy management of stage lighting fixtures.

### Stage extension platforms

The stage collapse in Indiana was preceded by another stage collapse in 2014 at Rosary High School in Anaheim, California.

Home- or shop-built decks and pit fillers are highly likely to not incorporate proper structural components and connectors required for the forces that are applied to a stage. Professional, engineered product, properly applied and anchored is the only correct solution — and likely the only solution that a risk insurer will honor.

In addition to good decking, all stage openings should be equipped with a fall-safety net system that complies with ANSI and PLASA standards for stages.

Finally, integration of an embedded actor safety strip light at stage edges will prevent accidental walk-off injuries when the bright lights prevent a clear view of the edge.

### Safer theaters

None of these items are budget busters. All of them increase the safety factor in a space being run by amateurs instead of IATSE union stagehands.

Performing arts spaces present risk in order to have the ability to create an artificial reality through properly placed lighting and amazing scenery. Taking the time to think outside of the old ways and to selectively integrate safety-inherent systems makes modern educational theater a success even when capital and operating budget limitations constrain what school districts would prefer to do.

Work with a qualified professional theater consultant early and throughout design to explore what is possible.

*K. Paul Luntsford is the president and principal consultant at PLA Designs. He has been a facilities design consultant since 1976 and has served as principal consultant and designer on numerous award-winning local and national projects.*

## MORE EFFICIENT

CONTINUED FROM PAGE 3

is a key element of facility operational excellence. Lake Washington School District and McKinstry meet monthly to review progress against their annual goals, controls contractors lead trainings with staff to help them understand the logic that controls the building systems, and the teams report energy consumption to the leadership of the district on a monthly basis.

There are many ways to reduce energy in a building, but schools have to always consider how these changes affect the learning environment. All of the standards and budgets in place at Lake Washington School District have been established by first looking to what the students need to thrive and then to how to run those systems efficiently.

### Behavioral changes

Students, teachers and building operators all play a huge role in maintaining energy efficiency. Additionally, engaging students in energy-efficiency projects can provide a valuable extracurricular experience.

Tahoma School District works to engage both staff and students in behavior change. This program incorporates outreach and engagement by connecting existing student “green teams” and sustainability programs. Teams at each school participate in tracking energy performance, conduct student energy audits, and take pledges to encourage sustainable behavior at their schools. Thanks to this program, the district has decreased their energy use by more than 25 percent.

Tahoma School District’s multi-pronged approach to sustainability has been nationally recognized. Four schools and the district itself have been recognized as Green Ribbon Schools, an award program established by the U.S. Department of Education to highlight schools and districts that demonstrate a

commitment to excellence in sustainability.

Tahoma was also the 2015 Washington state Green Ribbon District, recognizing its district-wide approach to sustainability curriculum and commitment to efficient, healthy facilities.

### A sweet spot

Most people think the only way to reduce energy is to buy better systems. In our experience, that’s only a piece of the puzzle.

Simply replacing mechanical systems or installing the right controls system won’t deliver optimal efficiency. It requires a commitment to operate those systems effectively with a focus on efficiency, comfort and performance, and then tie that to a robust occupant engagement program.

All three of these districts participate in Puget Sound Energy’s resource conservation management program, which provides additional ongoing incentive to keep this focus on efficient facilities. This in turn gives districts the confidence to tell a compelling story about their approach to capital projects and bond requests, because they are being responsible with the facilities they have.

It’s the responsibility of both the district and their partners to consider how these changes will affect the learning environment. Will they keep classrooms at the right temperature, well-ventilated and well-lit? Will the students and teachers be comfortable?

There is a sweet spot between efficiency and the learning environment. Our collective job is to find it.

*Lauren Frugé is a McKinstry program manager who works with school districts to implement McKinstry’s powerED program. Clint Hawn is a project director at McKinstry and is responsible for delivering integrated projects and services to school district clients.*



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# LANDMARK PAUL THIRY SCHOOL REOPENS TO STUDENTS AFTER 34 YEARS

Cedar Park Elementary was closed in 1981 and became an artist community. But now the modernist building has been restored.

In just a few days, schools will spring to life as students and teachers fill classrooms and hallways, beginning the journey of another school year.

In preparation, school districts across the region have been working diligently to address classroom space issues resulting from growing student enrollment. Districts are adding portable classrooms, building new facilities and modernizing others. Some districts are also breathing new life into closed schools.



BY DENNIS ERWOOD  
STUDIO MENG STRAZZARA

Cedar Park Elementary School, located in Seattle's Lake City neighborhood, opened in 1959 as a response to the rapid increases in district enrollment that occurred in the 1950s. At

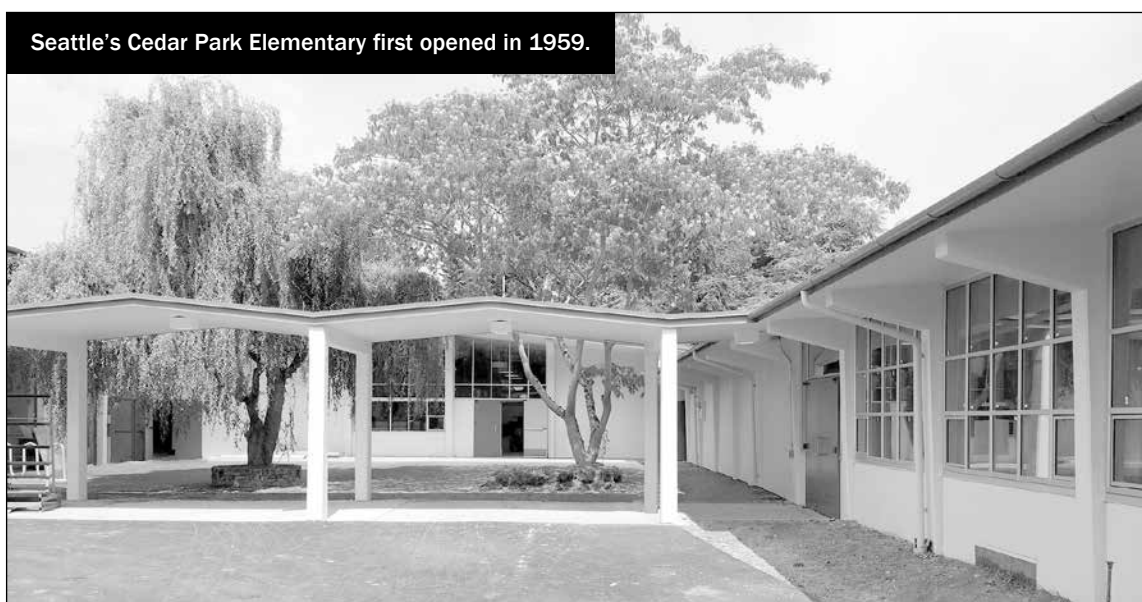
its peak the school had 437 students, but by 1981 the student population had dwindled to 197. The school was then closed and the remaining students were moved to nearby schools.

The property was then leased to the Cedar Park Arts Center, later called Artwood, which used the building as artists' residences and studios until 2014.

The artist community was a great steward of the property and the love they felt for the place was evident as you walked the site and building. But rapid growth in the Seattle Public Schools' student population has required the district to build new schools and reopen others that have been closed for decades.

Our office has been working with Seattle Public Schools to reopen two such schools, North Queen Anne School and Cedar Park Elementary.

Cedar Park Elementary was designed by the noted architect Paul Thiry, one of the fathers



Seattle's Cedar Park Elementary first opened in 1959.

PHOTO COURTESY OF STUDIO MENG STRAZZARA

of Northwest modernism. He was the supervising architect for the Seattle World's Fair and designed the Washington State

Pavilion — later renamed the Seattle Center Coliseum and now known as KeyArena. The school is designated as a Seattle

landmark in large part for its innovative structural system.

PAUL THIRY — PAGE 20



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# HIGH-TECH TOOLS HELP CONTRACTORS KEEP UP AS SCHOOL CONSTRUCTION BOOMS

Contractors are using drones and 3-D modeling to save time, cut waste and reduce injuries.

**A** K-12 school construction boom is underway, thanks to population growth and aging school infrastructure. In fact, it's one of the biggest construction sectors in Washington this year.



BY MARK KING  
SKANSKA USA  
BUILDING

According to the state Office of Financial Management, the population in Washington grew by 1.34 percent in the last year, passing the 7 million-resident mark.

This population boom has school districts on their toes addressing overcrowded schools and outdated facilities. For example, Tacoma Public Schools has 18 schools under construction this summer.

Typical school construction projects are small in scope and usually address immediate needs. As school infrastructure is aging and no longer suiting the needs of the growing population, we are now seeing large school expansion projects, including renovations and new school construction.

Skanska is using virtual design and construction techniques to build Tahoma High School.



IMAGE COURTESY OF SKANSKA USA BUILDING

## Tahoma High

Skanska USA Building is currently working on seven Western Washington K-12 construction projects. Utilizing virtual design

and construction (VDC) as a tool to improve construction delivery methods, Skanska is reducing the risk of job-related injuries on their K-12 projects during this construction boom.

For example, the Tahoma School District is addressing growth demands by building a new Tahoma High School in Maple Valley to eliminate significant overcrowding. Skanska is strategically implementing VDC processes for the project and seeing impressive results:

- VDC was used for Tahoma High in preconstruction to extract "quantities" from the models (referring to detailed measurements of materials and labor) and to compare them between design releases. Skanska worked with the design team to automate quantity "takeoff" from the design models (for bids and pricing), and developed Revit building-information modeling software templates that allowed models to be linked and instantly provide feedback on quantities.

- 3-D modeling software is used to develop layout drawings which aggregate all the information required for Skanska crews to build the new high school structure. The model is then divided into several phased "lift" drawings.

This saves trade personnel significant time in locating the information from multiple locations of the drawings set. This software is especially helpful at visualizing constructability issues, address-

ing design challenges and updating construction drawings.

Completed lift drawings are made available to all project personnel via "Digital Resource Stations" on the project or with tablet PCs, allowing the trades to access the information on the job site rather than having to go to the project office each time a question arises.

- Point layout software allows the VDC team or layout staff to insert geo-referenced points into the 3-D model.

The coordinates of those points can then be extracted to an Excel file and loaded into layout equipment used to stake out building components such as structure, parking and sports fields.

Point Layout software has streamlined the otherwise time-consuming and human-error-ridden manual layout process and saves hundreds of hours and thousands of dollars per project, benefiting both the contractor and the school district.

- Skanska leverages a cloud-based collaboration system to work seamlessly with our mechanical, electrical and plumbing (MEP) subcontractors to ensure that the schools' systems are fully coordinated prior to the start of installation. 3-D MEP coordination allows us to identify and resolve constructability issues in the office instead of in the field. This results in eliminating rework, avoiding schedule deviations and improving subcontractor efficiency.

- Skanska developed a 3-D site safety and logistics model that includes useful information like location of drive lanes, site entry points, first aid stations, hazardous material spill kits, and evacuation routes for the job site. This standardized safety model is easy for the team to create and update as the project progresses through various phases. Often things like first aid stations will be moved around the site to accommodate site conditions.

The model provides a clear and accurate safety plan for trade orientation and for crews to review at their daily safety briefings. Safe delivery of the project is a primary focus area for both the school district and the contractor.

## Other projects

Several other VDC processes are in use on other Skanska K-12 projects.

For renovations, laser-scanning technology captures existing structures after the interiors are demolished to produce a real world, as-built model. Due to the age of the building and lack of design technologies when the schools were built, there are often differences between the as-built drawings and the actual structure. The laser scans are then modeled in Revit and provided to the design team as the

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# STUDENTS HAVE THEIR SAY IN SEATTLE SCHOOL PROJECT

Seattle Academy students asked for an eco-friendly building with adaptable, high-tech spaces.

The urgent need for K-12 schools to offer programs focused on science, technology, engineering and mathematics requires developing not only new curricula, but also designing the physical spaces where this advanced learning takes place.



BY BECKY ROBERTS  
THE MILLER HULL  
PARTNERSHIP

Providing students with a foundation for success in an innovation-based economy means incorporating sophisticated elements such as labs and technically advanced facilities of a scale generally not found in primary and secondary schools. Addressing these needs in a building on a tight urban site versus a more typical sprawling school layout adds another layer of design complexity.

Our firm has designed several buildings for Seattle Academy of Arts and Sciences as it has grown, each offering a unique synthesis of the school's education goals and its location within the vibrant, mixed-use Capitol Hill neighborhood. Attention was given to repurpose existing buildings and to step up or down in scale and character to blend with the adjacent residential and commercial neighborhoods.

The newest building — opening to students in the fall — is for a “STREAM” curriculum that combines science, technology, robotics, engineering, arts and mathematics. The five-story STREAM building includes classrooms, labs and a two-story multifunction Learning Commons that integrates a nationally competitive robotics program with visual and performing arts.

## Embracing creativity

Seattle Academy is an independent school serving middle- and upper-school grades. Its educational curriculum is project-based and rooted in a “culture of performance” where risks are taken and creativity is embraced.

Beyond technical and creative academic disciplines, Seattle Academy students are also keenly engaged with their role in environmental responsibility. At the outset of the design process, we and project partners saw this firsthand.

Upper-school students in sustainability courses participated with our designers and the GLY Construction team in “visioning” workshops to establish project goals. Using the STREAM building as a case study in their course-

## SEATTLE ACADEMY STREAM BUILDING

### Owner:

Seattle Academy of Arts and Sciences

### Owner's representative:

Barry Leahy

### Architect:

The Miller Hull Partnership

### General contractor:

GLY Construction

### Mechanical/electrical engineer:

WSP

### Civil engineer:

Sitewise Design

### Structural engineer:

PCS Structural Solutions

### Landscape architect:

Site Workshop

### Acoustics:

BRC Acoustics & Audiovisual Design

### Building envelope:

Morrison Hershfield

### Geotechnical consultant:

GeoEngineers

### Code consultant:

T.A. Kinsman Consulting Co.

work, they shared research and creative ideas about sustainable building practices.

It quickly became clear these young visionaries were challenging designers and administrators to deliver innovation that demonstrated environmental responsibility, as well as a place that enhances the school community.

Project goals included a high-tech and flexible environment for learning, embracing opportunities for crossover of technology and art. The Learning Commons stitches together the urban campus by physically connecting the STREAM building to the existing Arts Center and gymnasium we had designed years before.

The Learning Commons spaces can be configured to support collaboration, teaching, research, study, rehearsal and presentation, student dining and social events. Wall surfaces are an array of digital projection, art display, writable surfaces and connection to the neighborhood outdoors. Breakout spaces at the upper classroom floors inspire these activities at a smaller scale.

Adaptability and sense of connection bring creative opportuni-

The south-facing side of the building has lots of windows to welcome sunlight.



PHOTO BY LARA SWIMMER

ties to lab classrooms. A flexible power and data infrastructure in the robotics and innovations lab support simultaneous setup for teaching, making and competition fields.

Floors three through five are organized with two lab classrooms flanking a shared prep room. Systems-intensive uses such as fume hoods were able to be concentrated in the prep room, allowing for natural ventilation and increased daylight in lab classrooms. Visual transparency between lab classrooms and prep rooms heightens the connection between spaces.

## A green design

The design team worked with school administrators to design a high-performance building, guided by principles established with the students. Features include an 11,900-gallon cistern that collects rainwater from the roof to be reused for nearly all of the building's toilet flushing and landscape irrigation.

Energy use is reduced through daylighting, passive cooling and a high-efficiency heating system that includes a radiant floor slab and hydronic ceiling system. At upper classroom floors, the south facade brings abundant daylight, controlled by exterior sunshades and interior window coverings.

Automated and manually operable window openings promote natural ventilation through classrooms, circulation and breakout spaces. Interpretive experiences allow users to engage with the school's environmental features.

A small green roof is visible from

classrooms, and a vertically landscaped exterior wall promotes natural habitat and enhances the streetscape. Bio-retention planters with native plants control stormwater flow and provide water-quality treatment.

Rooftop photovoltaic panels installed on the STREAM and Arts Center buildings harness solar energy. Sustainable, durable, long-life materials are used

throughout the STREAM building. The project is on track to achieve a LEED gold rating.

Seattle Academy's campus presented multiple siting challenges in terms of building scale, transportation impacts, materials and facilitating student life on the streets.

The STREAM building sits on a

STUDENTS — PAGE 20

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# NEW VANCOUVER HIGH SCHOOL PREPARES STUDENTS FOR CAREERS IN HEALTH CARE

It offers hands-on training and programs developed with help from medical professionals.

Health care is one of the fastest growing industries in the United States, both in employment and need for services.

According to the Bureau of Labor Statistics, occupations in health care-related fields are projected to increase by over 10 percent in the next decade. The need for health care services is also growing, with the number of people in Washington over the age of 65 projected to double between 2000 and 2020.

These facts, coupled with the severe shortage of K-12 medical education programs in Vancouver, presented a compelling reason for Evergreen Public Schools to pursue funding for high school medical programs.

In 2002, Evergreen Public Schools partnered with the Educational Service District 112, PeaceHealth Southwest Medi-

The 69,000-square-foot school has three levels and space for up to 600 students.



PHOTOS BY MAX MIKHAYLENKO, COURTESY OF LSW ARCHITECTS



BY VERONICA TATE  
LSW ARCHITECTS

cal Center and the Southwest Washington Workforce Development Council to write a grant requesting \$200,000 from the state of Washington to explore

high school medical programs co-located with a hospital facility. The state granted the research funding that same year.

Henrietta Lacks Health and Bioscience High School — aka HeLa High — was constructed 10 years ago and opened in 2013.

Providing in-depth education and hands-on learning opportunities for students interested in medical careers, the school bridges the educational gap for the students of Evergreen Public Schools.

## Outside partnerships

For HeLa High to truly prepare students for postsecondary education and future careers, it was vital that the school's curriculum be generated with the help of medical professionals. To accomplish this, Evergreen Public Schools conducted a number of community outreach symposiums and established unique partnerships with PeaceHealth, Legacy, Providence, Kaiser Permanente, Clark College, Washington State University Vancouver and private practitioners.

The district and its partners determined which educational programs would be the most useful to the community and would provide the students with the best chance for success in health care careers. The result is a variety of program offerings in biomedical engineering, pharmaceuticals, biotech, health informatics, anatomy, microbiology, advanced biology and advanced chemistry.

The partnerships also provided a number of benefits. Through them, the district was able to obtain in-kind contributions of equipment and curriculum and establish mentoring opportunities for students.

The working relationship with PeaceHealth Southwest Medical Center facilitated locating the school on property near the center. This proximity fosters interaction between the medical professionals and students on a regular basis.

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## Hands-on learning

HeLa High's 69,000-square-foot building is spread over three levels, providing educational space for up to 600 ninth-12th graders.

Although the majority of the learning spaces in HeLa High are classrooms and specialized labs, the building also houses a music room, a technology-based resource center, and a commons that doubles as an eating area and a presentation space.

Additionally, the building has a fitness room that is monitored by computers to provide integrated-learning opportunities for students interested in health education. The school is zoned to allow partial access for after-hours use by the community and members of the health industry.

The knowledge gained through the partnership process helped inform the design of each of the spaces within the school to ensure they adequately support the educational goals, one of which was to provide hands-on learning opportunities.

A nursing suite and pharmacy program are cornerstones in achieving this goal. The suite was designed to provide simulated opportunities to work with "real" patients for the distribution of probable prescriptions and responding to other call needs. The training can be recorded and viewed by the teaching staff from an adjacent control room where they can regulate the situations occurring in each patient room.

## Designed for flexibility

As with all projects, a successful design accounts for future

## HENRIETTA LACKS HEALTH AND BIOSCIENCE HIGH SCHOOL

**Location:**  
Vancouver

**Size:**  
69,000 square feet

**Completion:**  
2013

**School district:**  
Evergreen Public Schools

**Project team:**  
LSW Architects, Harper  
Houf Peterson Righellis,  
Terraza Design, Kramer  
Gehlen & Associates,  
Interface Engineering, MKE  
& Associates and Skanska  
USA



The nursing suite was designed to train students to work with patients.

needs as well as current requirements.

The school is designed with the understanding that the delivery system for education and the information provided to the students will continue to evolve to meet the needs of the state, the health care system and program changes.

Providing flexibility was paramount to ensure the usability of the facility for decades to come. One example of adaptability is that learning spaces can be rearranged to provide large-group instruction, small-group discussion or single-student mentoring.

The education program at HeLa High is based on having

an understanding of how to approach an issue using science, math and English as a total package, rather than treating them as separate elements. As technology grows, students and teachers will become more knowledgeable about how education impacts the health care industry.

Over time, the programs will be based more and more upon student research. Students are aided by school-wide Wi-Fi and computers in every classroom.

Another important component to designing for the future is minimizing the building's envi-

ronmental impact. HeLa High is Evergreen Public Schools' first project to meet the Washington Sustainable Schools Protocol.

One of the most unique sustainable design strategies is how the building addresses solar gain on the south facade. Sunshades constructed of photovoltaic panels provided by the Bonneville Environmental Foundation were installed to reduce energy use and provide an additional energy source for the facility. The foundation donated a kiosk located in the building's lobby that monitors the energy input.

Through relevant curriculum,

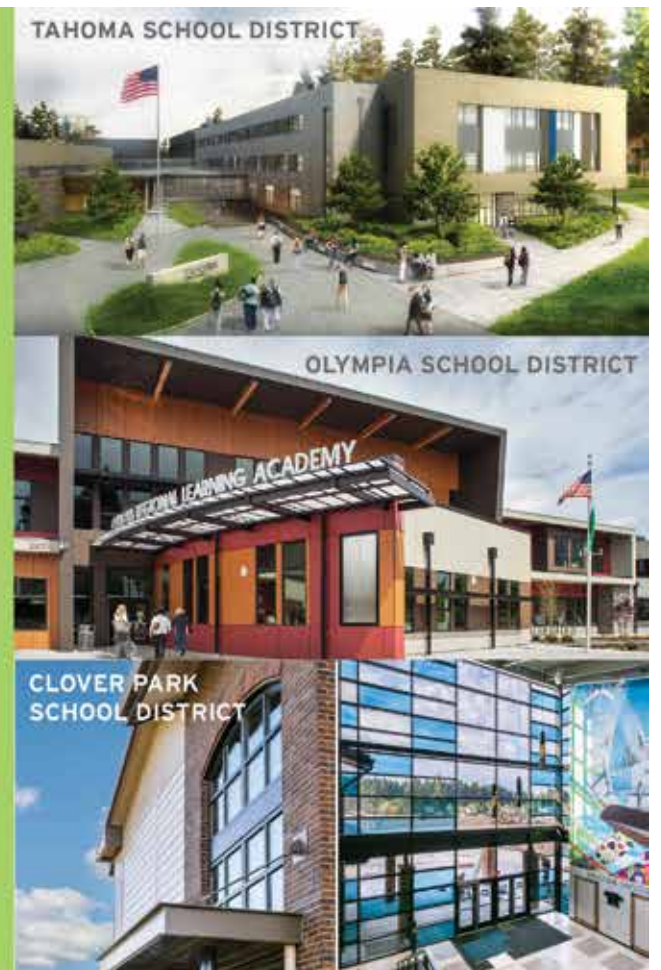
hands-on learning and flexibility for the future, the Henrietta Lacks Health and Bioscience High School provides a stepping stone for high school students interested in pursuing medical careers. By providing the framework, Evergreen Public Schools is giving students the best chance for success and ensuring that the community will have qualified health care workers in the coming years.

*Veronica Tate is an interior designer and marketing coordinator at LSW Architects in Vancouver.*

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# HOW TO DESIGN SCHOOLS TO PREPARE KIDS FOR CAREERS THAT DON'T EXIST YET

No one knows what the next 50 years will bring, so a new Bothell high school will be built for flexibility.

Designing school buildings was once a largely utilitarian task.

In previous generations, traditional instructional delivery methods consisted of paper textbooks, chalkboards and overhead projectors. Basic education construction



BY TIM JEWETT  
DYKEMAN

was formulaic and catered to these methods, with clusters of isolated classrooms and a separate office building, cafeteria and gym.

Today, educational practices look incredibly different and are constantly

evolving. Education now extends beyond the walls of the classroom, collaboration between students is crucial, the paper textbook is on the verge of extinction, and technology is paramount.

Technology has become an integral piece of preparing students



North Creek High is under construction on a 66-acre parcel in Bothell.

IMAGES COURTESY OF DYKEMAN

for the workforce in an increasingly tech-savvy world.

So how can school districts and architects design schools

that prepare kids for careers that don't even exist yet? How can architects and other professionals design schools that will

remain technologically relevant for the next 50 years?

The answer to this lies in the extent of collaboration and visioning that takes place in the pre-design process. Enabling the architect to be an effective partner begins with their inclusion in the project from its inception.

At Dykeman we are currently partnering with Northshore School District on North Creek High School, a new, comprehensive, STEM-focused high school in Bothell, slated to open in the fall of 2017. STEM schools focus on science, technology, engineering and math.

## Early conversations

On education projects of this scope, the architect has typically completed approximately 25 percent of the design when educational specifications are drafted, and the architect is invited into the conversation. Northshore School District took a progressive approach, inviting the architect to join their educational task force well ahead of the design process to participate in early conversations about teaching and learning in the 21st century, sustainability, environmental impacts and other factors.

Beginning in 2012, Dykeman participated in a visioning process with a team of school district leadership and representatives from the community, including the Workforce Development Council, Washington STEM, Cascadia Community College, BioQuest and McKinstry.

The goal of the Visioning Team was to engage in comprehensive, exploratory conversations

about the connections between instructional program opportunities, facility design and career pathways for future students. "Visioning" consisted of five half-day sessions held over five weeks. With over 30 participants from various segments of the community around the table, the team was able to dialogue in an open and free format — sometimes with significant disagreement — about how K-12 education should be evolving.

These conversations resulted in a clearly distilled vision: North Creek High School would be focused on sustainability, supporting 21st-century learning and beyond, with classrooms extending beyond the building. In addition, a STEM focus would incorporate high-demand fields of study and career opportunities, enabling students to experience real-world application of knowledge and skills.

When architects have a seat at the table from the inception of the visioning process they are able to understand the underlying motivations for various design decisions and are enabled to act as the district's "right hand" throughout the process. With early involvement comes a clear understanding of a school district's diverse and unique needs.

On the North Creek High project we have been able to accelerate the design process and remain flexible, collaborative and open to ongoing changes, particularly in response to changing technology and infrastructure. This acceleration, enabled by early partnership, trust and a willingness to remain flexible, is

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The architect took part in a pre-design "visioning" process to gain a deeper understanding of the school's needs.

what has truly differentiated this process.

### Common spaces

Innovative and early partnership between school districts and architects can positively impact the design in profound ways. In the case of North Creek High, this collaboration has yielded some exciting elements.

First, the common spaces of the school are unique: When you walk into the building, there is a very large, open two-story space. This space contains what we call "collaboration cubes," and classrooms will open up directly into it and to one another.

The classrooms are not isolated in hallways or sequestered as in the older, more traditional school building designs. The vast space just outside the classroom door will facilitate student and teacher collaboration, allowing projects to be created and displayed collectively.

Flexible furnishings and work areas create "hackable" spaces, yielding student ownership of their own work and educational environment. The design also calls for other numerous student-focused spaces to facilitate community-learning experiences.

The two-story library at North Creek will open up into a large common area, giving students more immediate access to library resources and ensuring that the library is directly integrated into the everyday experiences of students. In addition, the school will be outfitted with an engineering laboratory and a computer lab, with the art wing nestled in close to both to ensure that art and science are integrated.

A wetland is located in the very middle of the school. Instead of turning our backs on this supposedly "unusable" space, it became a focal point of the design.

All buildings look out onto the wetland, and interpretive signage will provide education about wetlands and their importance to the environment. In this way, nature



The school is slated to open in time for fall classes in 2017.

becomes a foundation of the curriculum.

The majority of the classrooms are north facing, creating daylight classrooms with minimal artificial lighting. Combined with a highly efficient building envelope, high-efficiency plumbing fixtures and LED lighting, North Creek is poised to be the most energy-efficient school in Washington state.

Savvy educators understand that effective educational practices rely heavily on collaboration among students. To be effective partners in education design, architects must understand this, too.

Collaboration must be the hallmark of the design partners' relationship with schools. Together, we can design spaces that surpass the needs of the next generation of learners.

*Tim Jewett is the managing principal at Dykeman.*



A large common area will be one of a number of flexible student spaces.



## HIGH-TECH TOOLS

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basis for their design.

Helicopter drones outfitted with pivoting cameras are leveraged for both aerial photography and mapping project sites or corridors. The cost of using manned aircraft for aerial photography can be prohibitive for smaller projects. The cost of a drone and the associated training can quickly be recovered by eliminating the cost for manned aircraft, and allows the team to photograph the site more often during the project.

Advances in VDC technology over the past several years have given contractors the tools to drive value by streamlining construction processes and eliminating waste. This also benefits clients by creating efficiencies and time savings so school projects, and others, can be delivered on time

## STUDENTS

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small lot relative to its program, so the massing needed to go vertical. To mitigate the bulk, the five-story structure was designed with two very different facades — the fully glazed facade to the south and the semi-blank facade to the east.

With this strategy, we were able to capture the best solar orientation for daylighting and natural ventilation, and buffer the single-family residences across the street to the east.

Seattle Academy became a member of the Seattle 2030 District, a high-performance build-

ing district. As designed, the STREAM building is expected to achieve an energy-use goal of 70 percent below the national median for a building of its type.

From our early days on the project, we could see the qualities of stewardship and innovation in the students we encountered. The sustainable educational elements grew from the students' emphasis on healthy, inspiring, responsible spaces. By adding a high-performance building to its school community, Seattle Academy tangibly represents its commitment to educational inno-

and on budget.

During this construction boom efficiency and effective communication will define the success of a project. Skanska's project teams are working closely with the VDC staff to develop innovative processes that streamline construction and clearly delineate the requirements and coordination of a project. The processes defined above are only a small part of the VDC activities that Skanska leverages in both preconstruction and construction.

*Mark King, a virtual design and construction manager for Skanska USA Building, has been working in design and construction for more than 30 years in the Seattle area and the Middle East.*

vation.

It has been tremendously rewarding to work on a project that embodies our firm's longstanding sustainable design philosophy, and which reinforces Seattle Academy's mission to enrich the experiences of students and teachers to bring out their fullest potential for a successful future.

*Becky Roberts is a project architect with The Miller Hull Partnership.*

## PAUL THIRY

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### Inventive upgrades

While the exposed and regularly spaced precast concrete frames, tilt-up concrete walls and precast concrete roof panels exemplify Northwest modernism, they created challenges in the renovation.

The structure also required seismic upgrading. Traditional reinforcing methods would not work due to the nature of the original design, so fresh ideas were needed.

Carbon fiber reinforcing was added to the top and bottom of the concrete roof panels, and the concrete columns were wrapped with it as well. This new approach allows the structure to meet current codes while retaining the character of the original design.

The building's walls and ceilings were insulated, and the mechanical systems were replaced with energy-efficient systems that provide ventilation for better indoor-air quality and greater comfort. The structure created some additional difficulties, as most areas have no ceiling space in which to conceal ductwork and sprinkler piping. Electrical upgrades included the replacement of power and lighting, and the addition of low-voltage systems for fire alarm, security and data.

Large expanses of glazing span between the concrete frames, and are a key architectural feature. The glazing is divided into square panes by aluminum frames; the original windows were of flat-bar construction with single glazing and stopped in with asbestos containing putty. The design created a unique triangular frame appearance from the exterior.

New, highly energy-efficient double-glazed aluminum windows replaced the original. There are no commercial extrusions made today that match the original windows, so we worked with a window manufacturer to come up with a solution that takes off-the-shelf parts from different window systems to create triangular-shaped window frames that are nearly identical to the original.

In addition to design and structural enhancements, the school needed more classroom space. Working with the Seattle Landmarks Preservation Board, custom design modifications were added to standard classroom portables to complement the school's architecture without distracting from the overall building and site configuration.

### Artwork remains

Roadway improvements, new sidewalks, parking and student drop-off/pick-up areas were constructed.

Seattle Parks and Recreation leases the western portion of the site from the school district. It was originally a large asphalt playfield that was in disrepair after the school closed, but several years ago it was transformed into a neighborhood park, largely due to the efforts of the Artwood tenants and neighboring community members. The park will continue to serve the community and will be used by the students during recess.

Some of the artwork created by the Artwood artists in their studios at Cedar Park is incorporated into the design, providing students and the community another connection to the site's history.

When it opens this September, Cedar Park School (as it is now named) will house students and staff from Olympic Hills Elementary School while their building is being replaced with a newly constructed school. After two years, the Olympic Hills students will move into their new school and Cedar Park School will go back to its original use as a neighborhood elementary school.

*Dennis Erwood is a principal leading the education studio at the Seattle-based architectural firm Studio Meng Strazzara.*



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