

# ELEMENTARY SCHOOL

## Blakely Elementary School

Bainbridge Island  
School District



### EXECUTIVE SUMMARY—

For this \$33 million replacement of a 1960's inwardly-focused courtyard building, the Bainbridge Island community envisioned a seamlessly integrated landscape of shared, collaborative learning experiences that amplify strong student achievement and empower their ever-innovating teaching culture by transforming the school's relationship with its richly wooded site.

The educational program at Blakely empowers 450 children in Pre-K through 4th grade to become lifelong learners in a global society. Alongside extraordinary academics, Blakely embodies a culture of kindness, respect and creativity that is nurtured by a strong community of faculty, staff, volunteers, parents and kids—all aspects stakeholders agree are embodied in Blakely's new, L-shaped learning communities.

Clusters of core learning spaces are both centered on and folded around a series of shared collaboration spaces, providing equitable access to diverse educational environments that flexibly support individual, small- and large-group activities. The collaboration spaces are themselves clustered, surrounding and seamlessly connected to an outdoor 'learning launch pad'. All of these spaces are linked by a spine that moves from the first community contact with the site to the forest to the east.

# SCHOOL + COMMUNITY ENGAGEMENT

## Community Context

Blakely Elementary School serves the children and families of south Bainbridge Island, a community treasured for its beautiful, rural environment of Northwest forest and Puget Sound shoreline.

**HISTORY**—Blakely is located on the ancestral homelands of the Coast Salish people. By the late 1800s, Port Blakely boasted the world’s largest sawmill. Mill workers came from many nations. Japanese, Pacific Islander and Suquamish communities were in the surrounding area. Many Filipinos emigrated to the island during the 1920s or as shipyard workers during World War II. The waters surrounding the island attracted Croatian fisherman who settled an area once called Ichville (now Eagledale).

**EVOLUTION**—Since the 1960s, Bainbridge Island has increasingly become a bedroom community of Seattle, a 35-minute ride away by ferry. The island community is acutely aware of their need to preserve resources and green space, and is carefully controlling development (both residential and commercial). The Bainbridge Island Land Trust, city and park district are instrumental in maintaining open space and, given island roots as a Mill town, wood remains a defining aspect of local culture.

**SITE**—The 12-acre site is located within OSR-.4, Open Space Residential zone. It is within a Critical Overlay District, which generally includes aquifer recharge areas, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas and wetlands. The site is upstream of wetland areas on the neighboring IslandWood environmental education site, within an aquifer recharge area.

## Engaged Stakeholders

Stakeholders included not only the Blakely Education Specification Committee (BESC)—comprised of 14 members including the principal, teachers, parents, neighbors and a school board member—but also students, alumni, IslandWood staff, local neighborhood associations, and the community-at-large.

An open public engagement process drew community-wide participation, and was followed by in-depth stakeholder engagement, user group meetings and student outreach sessions. The inclusive and transparent process ensured that all voices were heard and considered in the outcome. The result was a collaborative co-creation of Blakely’s design.

## Community Value

Bainbridge residents recognized the once-in-a-lifetime opportunity rebuilding Blakely presented. As such, the community asked that this project advance the Bainbridge Island School District’s (BISD) learning objectives by providing improved indoor-outdoor learning and play spaces, enhance STEAM facilities, and meet high sustainability goals for energy, daylighting and healthy materials.

As part of the collaborative process, a collective hope emerged that the new Blakely Elementary School would symbolize the values of the south Bainbridge community, be a healthy and sustainable outgrowth of the beautiful landscape, and enable meaningful learning experiences for generations of Bainbridge Island’s children.

## Available Assets

Despite the poor condition and ill-fit of their existing building, Blakely’s community of learning was beloved. And therefore, strongly defended. Preserving the characteristics that made Blakely so special—the camaraderie, culture, and discovery—with their simultaneous need to reimage space itself, resulted in a generative, growth-mindset driven design process. Additional assets included:

- Dramatic site with enveloping forest edge and slope rising 14 feet from road to forest
- Strong community support for Arts, Music and STEAM
- Teachers and staff eager to actively engage in the design process
- Stakeholder team supportive of longer term investments in energy saving strategies and innovative outdoor learning spaces

## Project Challenges

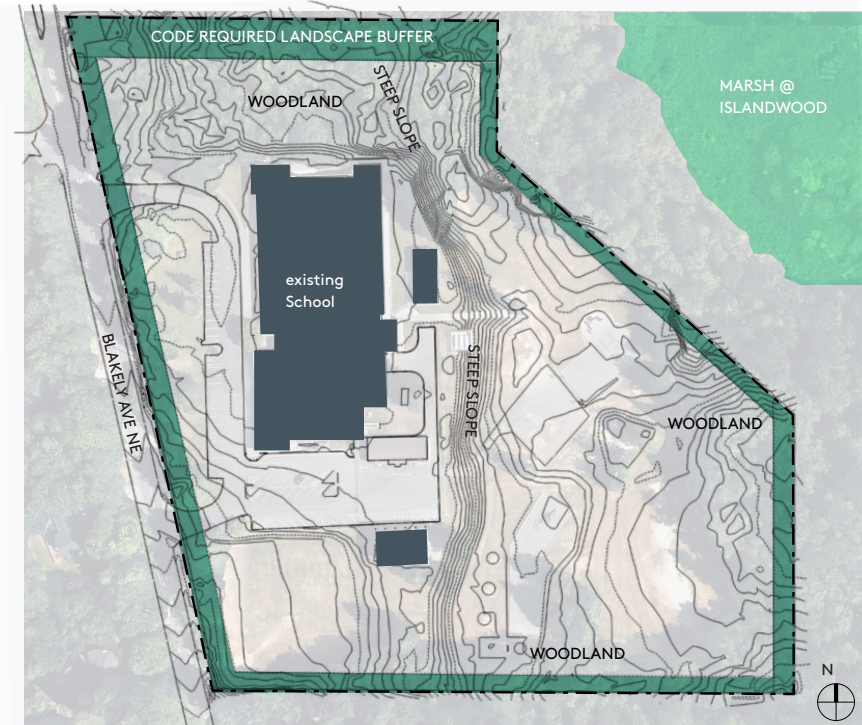
From the onset of the design process, a close interplay between the project size, budget cap, regional cost escalation, and quality of work and materials existed. Well into the process, jurisdictional updates to the land use code drastically increased wetland mitigation requirements, critically challenging the budget. Additionally, project challenges included:

- Cost issues connected to building with extensive grade change
- Smaller subcontractor pool for bidding and construction in Kitsap County
- Construction timing challenges from the busiest construction market in the country

# SCOPE OF WORK + BUDGET

Owner:	Site Area:	New Native Plantings:	Building Area:	Const. Cost:	Cost Per Square Foot:	Square Feet per Pupil:	Student Capacity:	Occupancy Date:	Grades Housed:
Bainbridge Island School District	12 acres	> 20,300	68,000 SF	Bldg: \$26.6 M Site: \$6.6 M	\$392 (Building)	151	450	Fall 2019	PreK-4





**Above**—2016 site plan with existing school prior to new construction

**Left**—Project is located on Bainbridge Island, a ferry ride away from Seattle

**Below**—New site plan with replacement elementary school located up the hill



## SCHOOL + COMMUNITY ENGAGEMENT

### Early Programming— Poll, Precedents and Presence

**POLL**—A web-based survey of staff and faculty explored the use and perceptions of the existing buildings and projected needs for the new design.

Some of the key faculty findings from the poll:

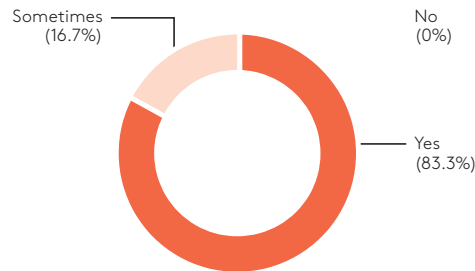
- The **people** (100%) and the **community** (83%) were the overwhelming elements that made respondents feel most proud of Blakely.
- Community, passion** and **warmth** are words respondents felt best described Blakely.
- Classroom temperature** is an area for improvement; 75% of respondents said it rarely feels right.
- 66% described **acoustic characteristics** of their classrooms as sometimes uncomfortable.
- Only 50% of teachers feel **connected to nature** in their classrooms.
- 83% would like to **take class outside** more often.

The last two poll responses would become a major driver for the school design, creating connected and permeable outdoor spaces for learning.

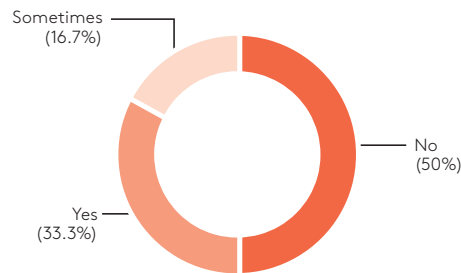
**PRECEDENTS**—The core team toured six schools to understand the opportunities, challenges and successes of other schools in the region. The precedent tours were essential for building common design reference points for the programming team. A focus of the tours was analyzing successful shared learning spaces, circulation pathways and activity adjacencies.

**PRESENCE**—a carefully orchestrated ‘shadow day’ at the existing Blakely School with four design team members attending 21 activities in parallel across a school day, including a fire drill! Teams were woven across every class and activity. The understanding of multiple parallel room activities and lack of usable shared learning areas were major outcomes.

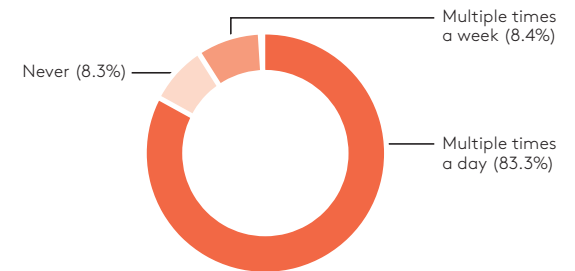
Would you like to take your class outside more often?



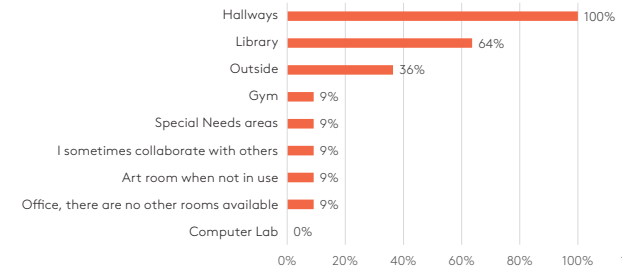
Do you feel connected to nature in your classroom?



How often do you think you will use the Shared Learning Spaces in your new facility?



What spaces other than your classroom do you use for teaching purposes (for tutoring, small group work, make-up tests, etc.)?



**Above**—Results from the survey of staff

**Below**—Student life during a ‘shadow day’ on campus

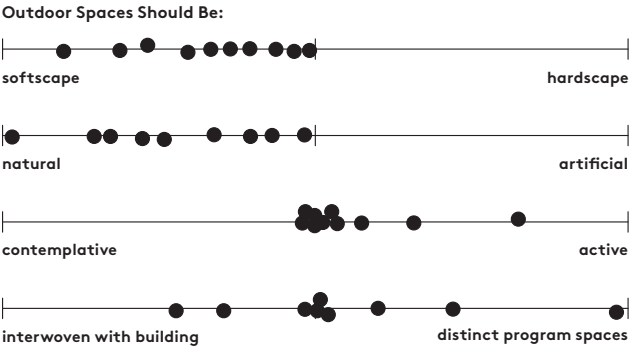


# SCHOOL + COMMUNITY ENGAGEMENT

## Preference Analysis— the Spectrums of Choice

Spectrum analysis was used early in the Ed Spec process to solicit collective opinions and identify priorities or places of creative divergence for elements related to landscape, learning spaces and aesthetic look and feel of the school.

**MAJOR PREFERENCES**—Grades intermingled, natural interwoven landscape spaces, vertically and horizontally connected campus, manifest sustainability, classroom and shared learning focus.





## SCHOOL + COMMUNITY ENGAGEMENT

### Co-Creating Approach—

Hands-on, user-engaged interactive sessions utilized active design processes for collaborative iteration with a core group of educators. These workshops set initial spatial frameworks for the project, helped determine final adjacencies, and led to key design concepts like the 'spine' concept and the 'classroom L'.

**SPINE**—With a need to keep the existing school open during construction the new school would be pushed further back on the site with a fourteen foot rise to the level ground to the east. A challenge to the team was to make this a positive element of the new school. An interactive design exercise with teachers led to a central spine, that would be landscape infused, and ultimately connect to a design theme of the forest and trees. This 'uplifting' spine would vary from canopies, courtyard, timber lined stairs, and a variety of diverse environments flanked by a procession of structural tree columns.

**CLUSTER**—The L-shaped classroom cluster geometries developed from a series of spatial adjacency exercises with the teachers that explored sightlines, equitable access and feeling of community. The traditional linear arrangement of classrooms was modified and folded around a common shared learning space, that then folded and enveloped a learning courtyard. Within the courtyard, gathering spaces immerse students in nature and quiet study, complementing indoor classroom learning activities and Blakely's environmental education focus. The arrangement provides teachers clear sight lines and learners equitable access to collaborative resources and flexible learning environments that support individual, small group and large group activities.



Teachers working with the design team on spatial adjacency exercises for central circulation spine (above) and learning clusters (left).



## SCHOOL + COMMUNITY ENGAGEMENT

### Collaborative Exploration in Three Dimensions—

Building off the early workshops, the team moved into three dimensions using virtual reality, physical modeling and three-dimensional sketches to engage teachers fully in the design experience. Working three dimensionally enabled greater understanding and collaboration by faculty to confirm both concept and functionality of educational spaces.





## EDUCATIONAL ENVIRONMENT—

### Goals

During the Educational Specifications process, a collective hope emerged that the new Blakely Elementary School would symbolize the values of the south Bainbridge community, be a healthy and sustainable outgrowth of the beautiful landscape, and enable meaningful learning experiences for generations of Bainbridge Island's children.

Goals for Blakely's learning tone were defined as:

- WELCOMING:** at arrival and after hours
- INVITING:** so that people want to walk in
- INTEGRATED:** merge landscape, sustainability, and curriculum
- IMMERSIVE:** see and feel drawn to be outdoors
- CELEBRATORY:** library as a special place at the terminus of a central spine
- COMMUNITY-CENTRIC:** foster socialization

### Supporting Curriculum

Early in the process, school and community stakeholders identified three culturally important spaces that fostered learning and community. They became the 'many hearts' of Blakely:

- LIBRARY:** beloved space, instilling a sense of school identity for generations
- OFFICE:** community-building space for staff and parents
- FOREST SETTING:** character-defining educational resource, connecting kids with nature

**Four key educational goals emerged and are supported by the design.**

#### FOSTER NEXT GENERATION LEARNING

- Respects, honors and extends traditional and innovative learning opportunities; exploration is driven by curiosity, discovery inspired by play, creativity and enhanced by technology
- Supports the quest for knowledge and discovery by celebrating and expressing the learning process through transparency between spaces
- Inspires engagement in academic excellence by creating programmatic flexibility and adaptability to support evolving pedagogy

#### ENHANCE CONNECTIVITY, SAFETY AND FLOW

- Encourages access to the surrounding natural environment and nature-based play through direct connection and launching-pad spaces
- Employs balanced visual transparency to promote interconnection and safely layered functionality
- Captures time previously lost to transitions; allowing more time for educational innovation

#### STRENGTHEN COMMUNITY

- Celebrates and strengthens the Blakely School culture and larger Bainbridge Island community
- Accommodates expansion and conveys wholeness, regardless of enrollment
- Provides a welcoming place for parents and community users, inviting partnerships

#### CREATE A HEALTHY ENVIRONMENT FOR LEARNING

- Invites natural light into places of learning
- Integrates sustainability with the learning process
- Promotes wellness and enhances learning through healthy materials and building systems
- Prioritizes acoustic comfort and performance
- Designs for lifetime maintenance commensurate with district resources



#### Supporting a Variety of Learning and Teaching Styles + Adaptable Flexibility

Descriptions and illustrations are represented on the following pages.

**In the Blakely School Community, we believe each student should be actively engaged in the pursuit of academic excellence. Staff, parents, and community work collaboratively to nurture and challenge each student to achieve their greatest potential and become active contributors in a global society. We appreciate and respect individual differences, and honor creativity and kindness.**

*-Blakely Elementary School Vision*



## EDUCATIONAL ENVIRONMENT



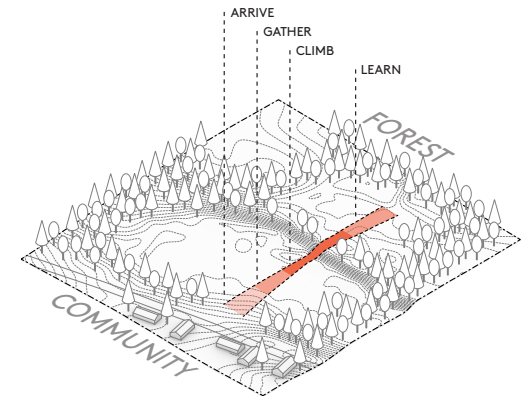
### Resolution of their Vision

Through workshops with teachers and staff, a design parti emerged that celebrated the rising topography of the site, centered learning communities within a framework for collaboration, created a quilt of indoor and outdoor experiences, and connected sustainable performance with environmental education curriculum.

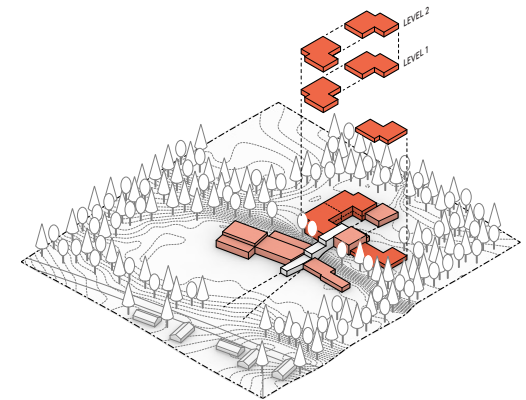
With the existing school at the front of the site occupied through construction, the new school would need to sit upland and tight to the adjacent forest of IslandWood, a 265-acre environmental education center that wraps the site on three sides.

The design solution embraces the glacially carved hill that previously bifurcated the site, creating an uplifting spine that links Blakely's multiple hearts; spaces stakeholders identified that nurture the life of the school community, specifically the office, the library and the forest setting.

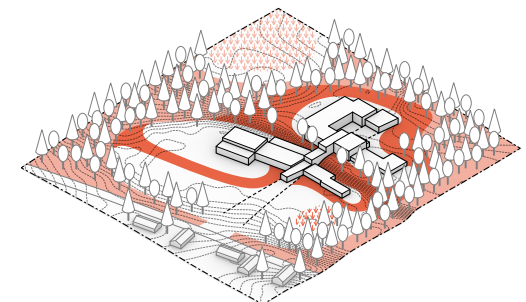
Marked by a series of folded shells that open to views of the site, combined with a column line of load-bearing whole tree columns, the circulation spine provides an experiential marker from the community entry to the library terminus on the forest edge.



CIRCULATION SPINE

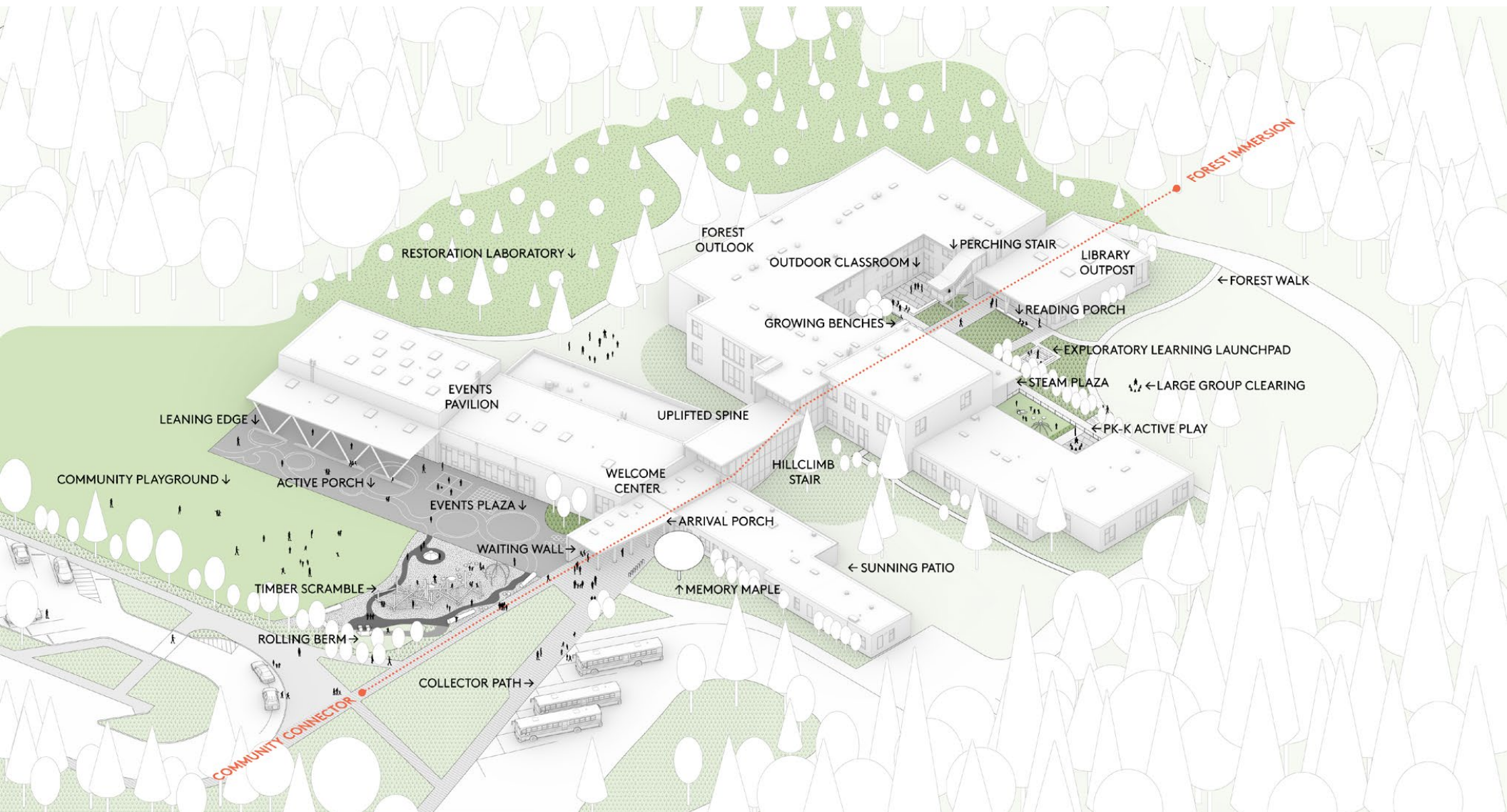


SHARED LEARNING CLUSTERS



RECONNECTED FOREST LANDSCAPE

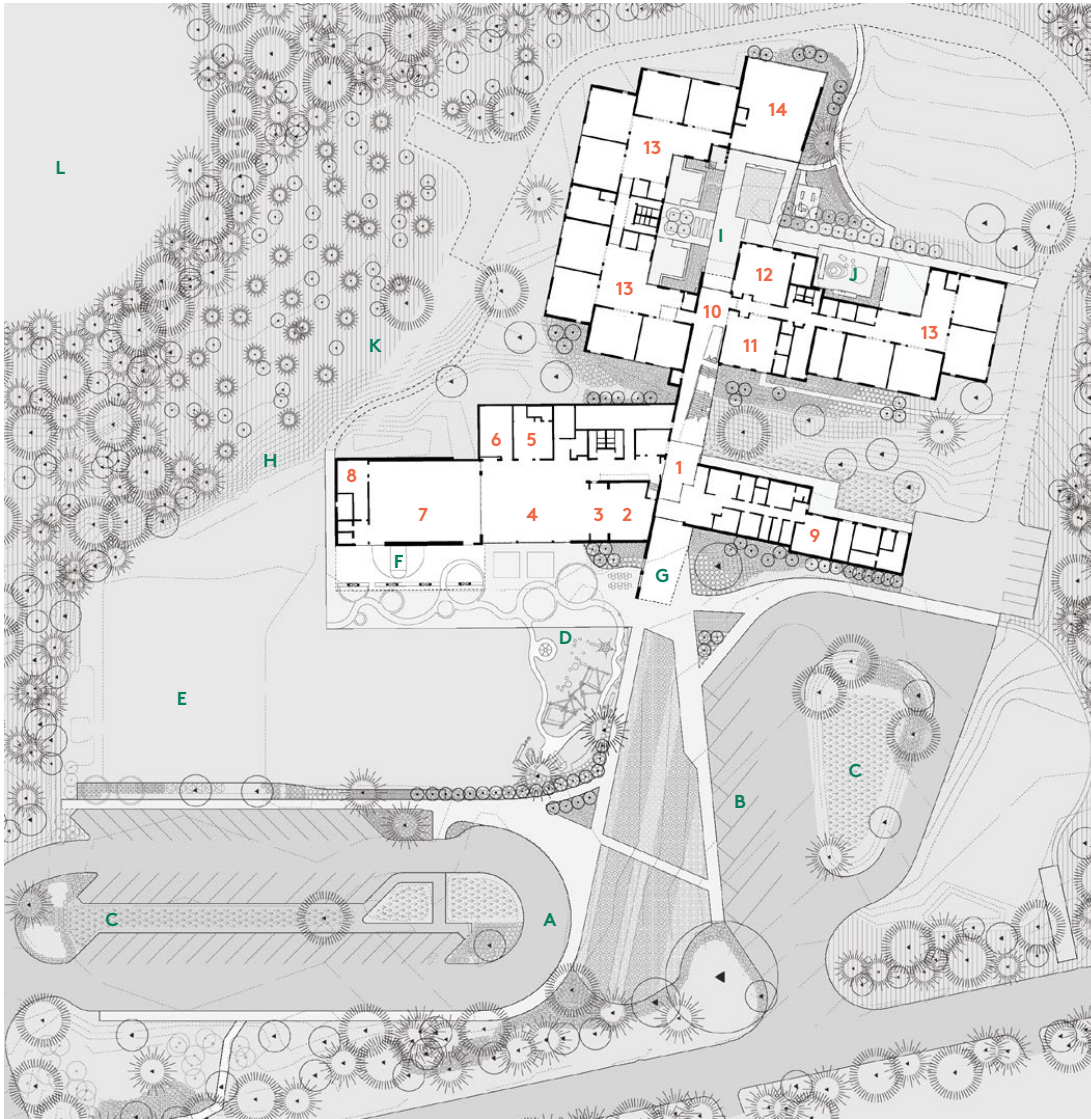
## EDUCATIONAL ENVIRONMENT



### Activated Site

Traversing to the forest edge, the connecting spine celebrates the hill and creates an immersive indoor-outdoor learning environment while reaching back out to the community.





UPPER LEVEL FLOORPLAN



## SITE KEYNOTES

A	PARENT DROP OFF + PARKING	G	COVERED ENTRY
B	BUS DROP OFF	H	HILL CLIMB
C	BIORETENTION	I	OUTDOOR LEARNING COURTYARD
D	PLAYGROUND	J	PRE-K OUTDOOR LEARNING
E	PLAYFIELD	K	FOREST RESTORATION AREA
F	HARDCOURT PLAY	L	WETLAND

## FLOORPLAN KEYNOTES

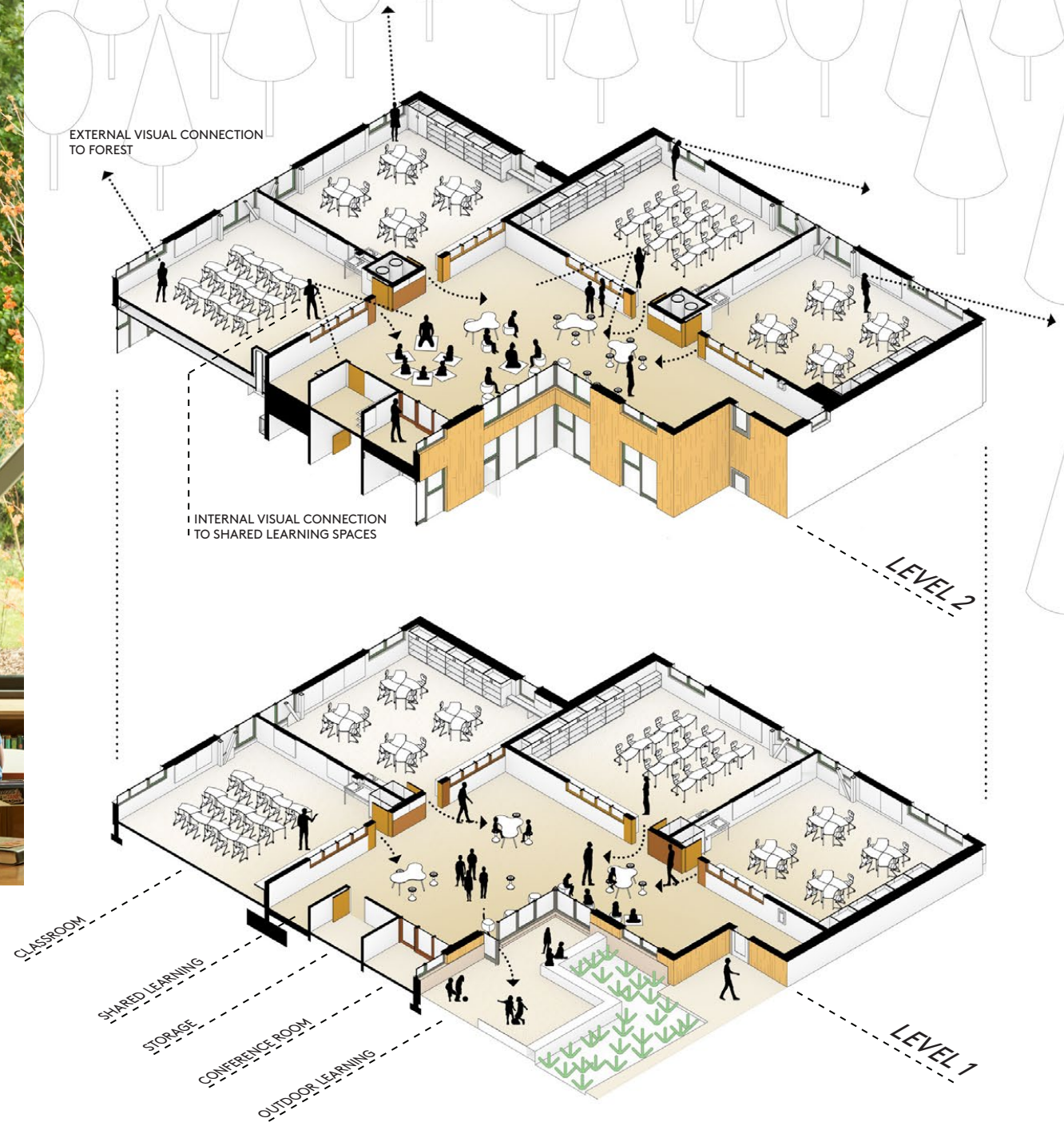
1	LOBBY	7	GYM	13	LEARNING CLUSTER
2	MUSIC	8	GYM ADMINISTRATION	14	LIBRARY
3	STAGE	9	MAIN OFFICE	15	RESOURCE ROOM
4	COMMONS	10	CIRCULATION	16	INDEPENDENT LEARNING
5	KITCHEN	11	ART ROOM	17	OCCUPATIONAL THERAPY /
6	STORAGE	12	STEM ROOM		PHYSICAL THERAPY ROOM





### Immersive

The L cluster geometry affords immersive integration with the forest. This simple gesture creates a high performing educational space where students study while experiencing the psychological, immune, endocrine and cardiovascular system benefits of forest bathing.







**"The shared learning space is a game changer. Better than I ever could have imagined! It allows so many creative possibilities with individual students, groups, classes or even whole grade levels!"**

**-Teresa Ball,**  
*Blakely School Teacher*

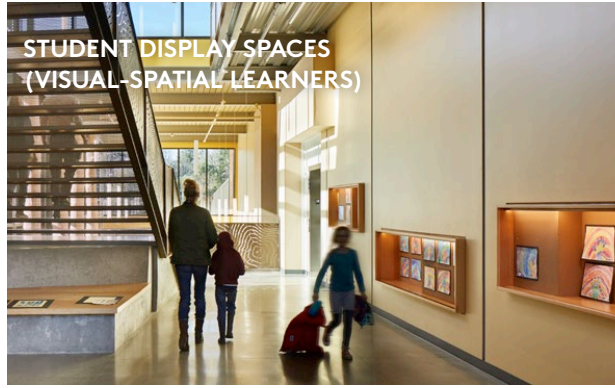


## EDUCATIONAL ENVIRONMENT

HANDS-ON MAKING SPACES  
(PHYSICAL-KINESTHETIC LEARNERS)



STUDENT DISPLAY SPACES  
(VISUAL-SPATIAL LEARNERS)



PROJECT PRESENTATION SPACES  
(AURAL-AUDITORY LEARNERS)



INTROSPECTIVE SPACES  
(SOLITARY-INTRAPERSONAL LEARNERS)



COLLABORATIVE SPACES  
(SOCIAL-INTERPERSONAL LEARNERS)



FLEXIBLE, FOCUSED SPACES  
(LOGICAL-MATHEMATICAL-READING-WRITING LEARNERS)



GROUP DISCUSSION SPACES  
(VERBAL-LINGUISTIC LEARNERS)



### Supporting Diverse Learning and Teaching

The full spectrum of spaces (size, configuration, adjacency and resources) help staff develop best-practice teaching methods and activities for their exploratory, multi-modal curriculum and ensure all students reach successful levels of understanding—no matter what their preferred learning styles may be.





**Launching pad for forest excursion and magnet for learning outdoors, the Learning Courtyard integrates STEAM curricula, is paired with indoor STEM lab and Art spaces, and connects to shared learning areas.**

Opportunities for environmental and experiential learning is integral, achieved by subtly embedding stories in paving, walls, or softscape. Connections between indoor and outdoor learning spaces are strong, with outdoor space covered for protection from the elements.

Beyond, the surrounding site (which was previously lawn and pavement) has been restored to a native forest condition with on-site stormwater management. Amid the reclaimed landscape, dispersed outdoor learning spaces are rustic in character, primarily composed of natural materials, with informal layouts.





### Naturalized Playscapes

Outdoor areas are designed to encourage exploratory play with extensive use of natural materials and forms to promote and accommodate physical and athletic activity, self-directed and safe nature play, and more traditional playground equipment.

Playfields accommodate games such as soccer and become an asset to the community after hours. Playground equipment features log structures and materials that engage a child's imagination, drawing connections to the environment around them.





## PHYSICAL ENVIRONMENT—

### New Space Spirits a New School Song

By Elaine Hanson, 2019

*"Notice the trees as you come through the entry  
Notice the trees as you climb up the stairs  
Notice the trees in the lovely library  
Notice the trees on the second tier  
Our brand new school is like a tree  
With roots and a trunk and a canopy"*

[Click here](#) to view Blakely students  
perform the full song.

#### Physical Attributes that Inspire and Motivate

Research shows that connections with nature improve learning. Blakely is an immersive biophilic environment, reducing stress and anxiety levels. Inspired by the craggy dark bark and orange core of the Douglas fir, the building skin is composed of fractal vertical patterns of metal skin and clay-colored window surrounds, punctuated by vividly-exposed seismic braces. Guardrails are inspired by tree rings, artisanally modified in a computational script to abstract for structural function and the technical process of laser cutting from steel plate.

Conceptualized to provide a seamless interior-exterior learning experience, Blakely's forested perimeter is a tremendous asset and the new school incorporates ample opportunities to connect with nature. The playground and outdoor learning environments encourage exploration and help make movement fun for different types

of learners. Accessible walkways and trails, open areas and equipment options enable kids and community members of all ages and physical abilities to engage with nature, develop physical skills, interact with others, and feel refreshed.

#### Fitting into the Larger Community Context

For decades, children were welcomed to school each morning by an elegant Japanese Maple holding court at the entrance to the existing building. Proudly planted by students on Arbor Day in 1967, this special tree was a part of the Island's cultural memory bank. Efforts to relocate the Maple became an Island-wide calling. Extreme care was taken to give this special tree a new home at the school's new front door, honoring its emotional relationship to the community at large. Generations of students can now carry on the legacy of memories made at Blakely; walking and waiting below its protective canopy.



**"When we give up and lose hope, we're failing future generations. Even though this seems like a small thing, I think it's part of a much greater hope... To see the community really come together is just beautiful."**

*-Christine Perkins, Blakely parent who helped organize fundraising to relocate the maple*

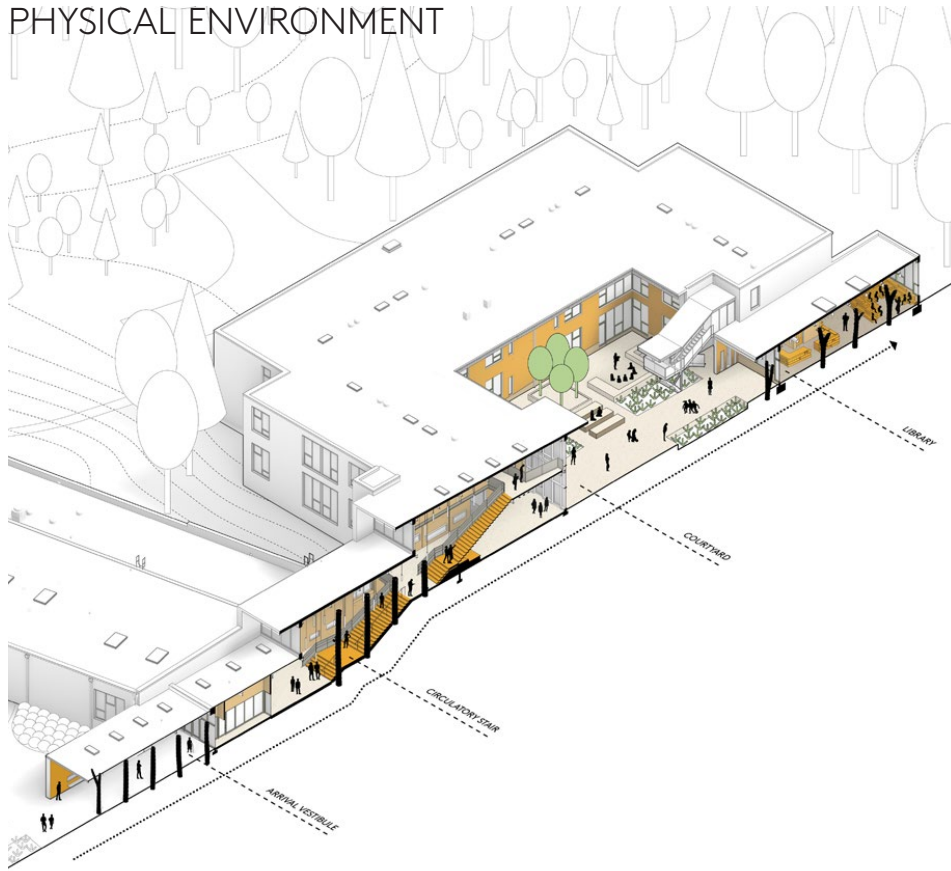
#### Additional community-serving features include:

- Now pulled back from street, the playground and community gathering spaces are up front; strengthening bonds between Island families.
- Improved vehicular flow has relieved previously intense congestion on a major commute corridor.
- Demonstrating high performance in key areas was critical for the future resilience of the whole Island

Descriptions of high performance strategies achieved are represented on the following pages.



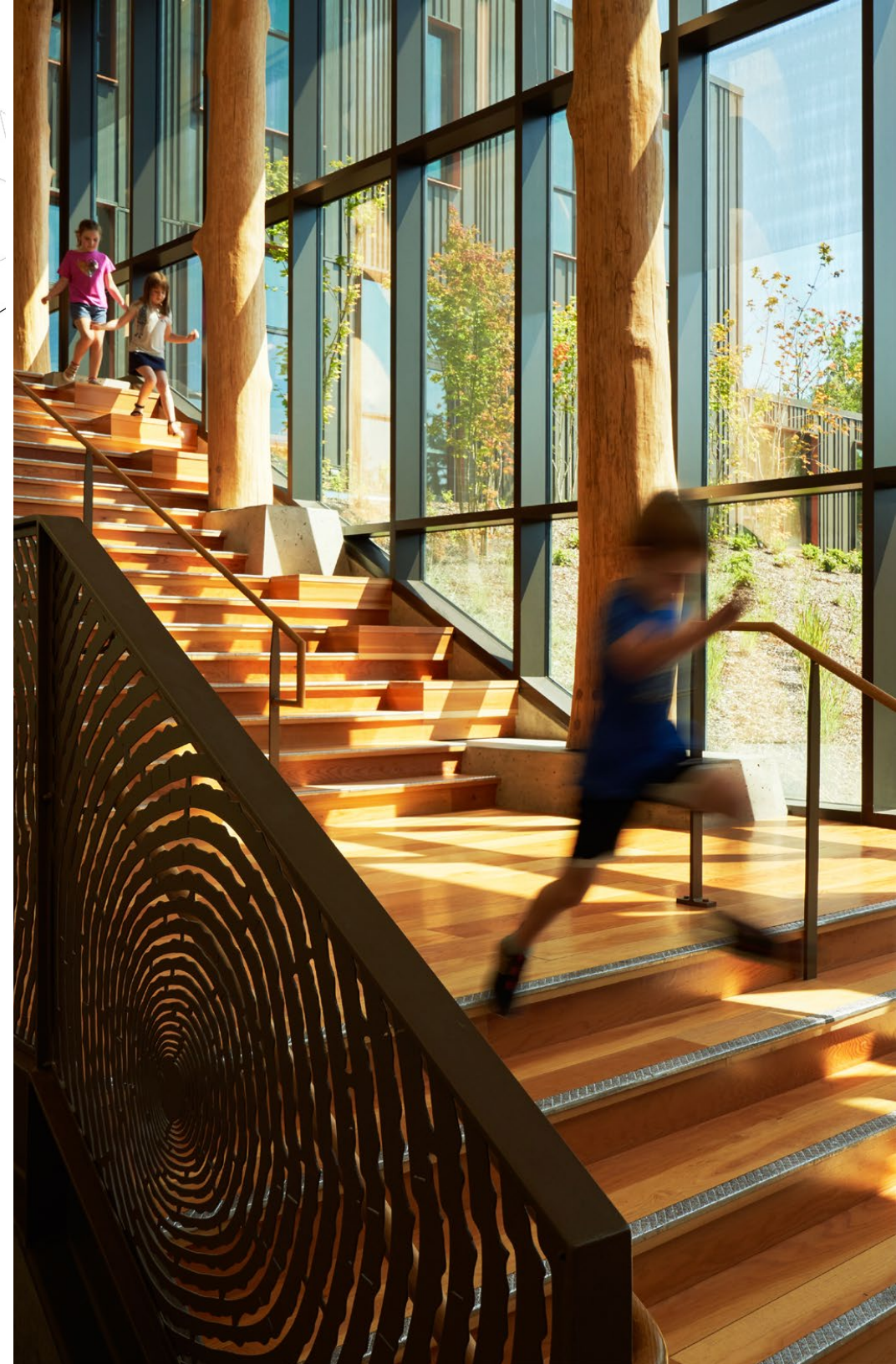
## PHYSICAL ENVIRONMENT



### Processional Forest Spine

Wood is important to the history of Bainbridge Island and the community communicated that timber continues to represent important cultural Island values. Punctuated by a colonnade of un-milled, live-edge structural tree columns, Blakely is organized around an east-west oriented spine that runs from street to forest edge.

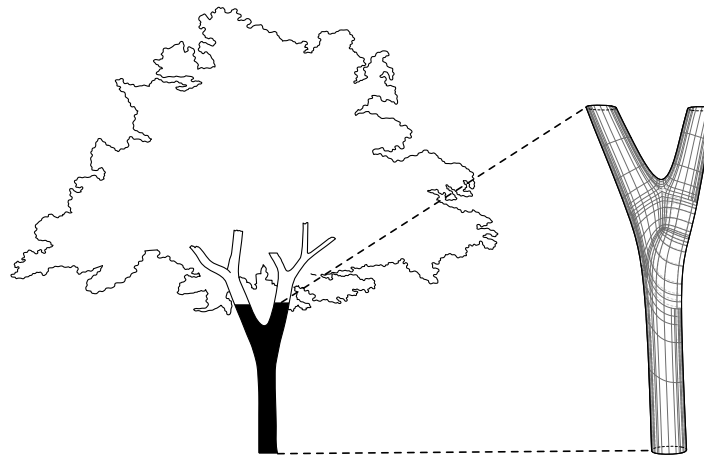
The 'Uplifted Forest Spine' marks the procession from reception to the library, clarifies orientation and eases wayfinding by featuring timber as a primary architectural element in a multitude of forms. Cedar lines the folded shells that mark the school entry. Wood stairs and walkways are washed with daylight that accentuates the grain and draws students up and through the school. Stacked glue-laminated beams are creatively assembled to create a reception desk, library entry desk and forest-edged story nook, all evoking the history of Port Blakely Mill and its massive timber piles. And, following the flow of this spine are laser-cut steel guardrails designed from computational modification of tree ring geometries.



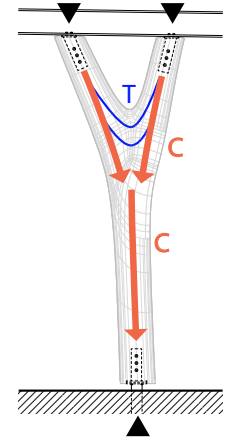




TREE SELECTION AND EXTRACTION



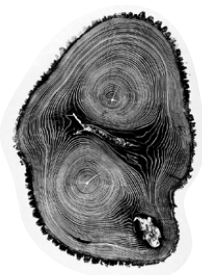
STRUCTURAL LOADING



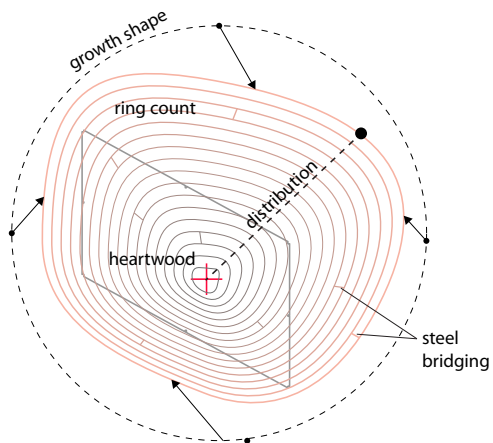
### Whole-Tree Structure

24 white oak trees were scouted and laser scanned in the forest. Selected trees were felled, cleaned and graded for use throughout the project as load-bearing columns.

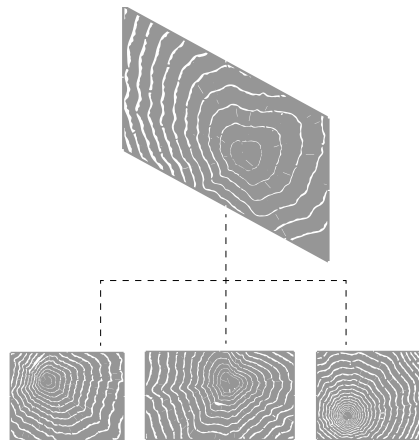
PATTERN INSPIRATION



PARAMETRIC DEFINITION VARIABLES



CUSTOM PATTERN CREATION

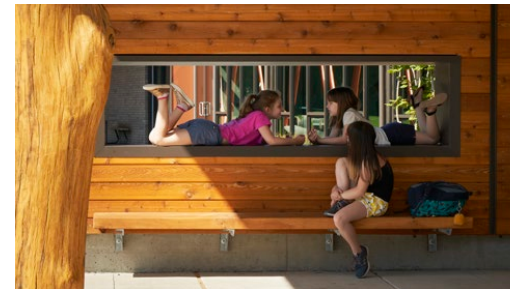
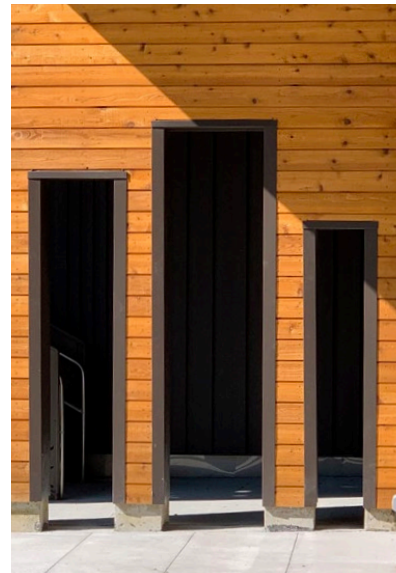
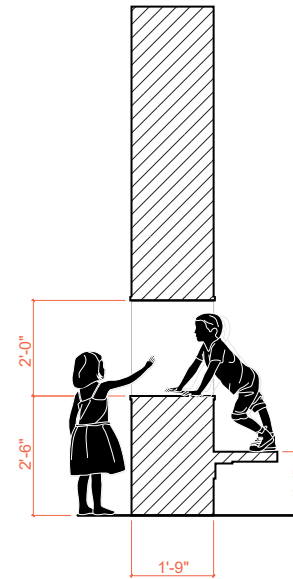
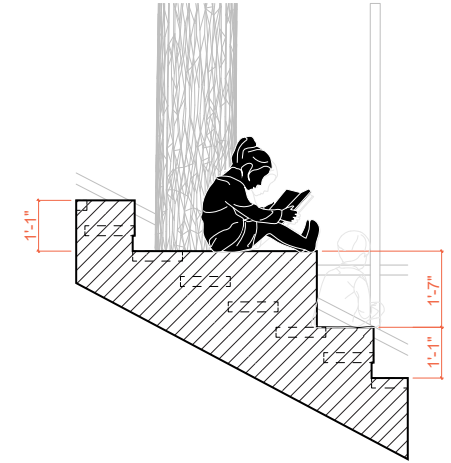
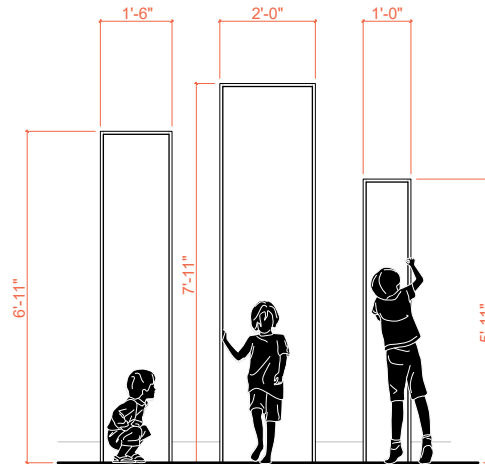
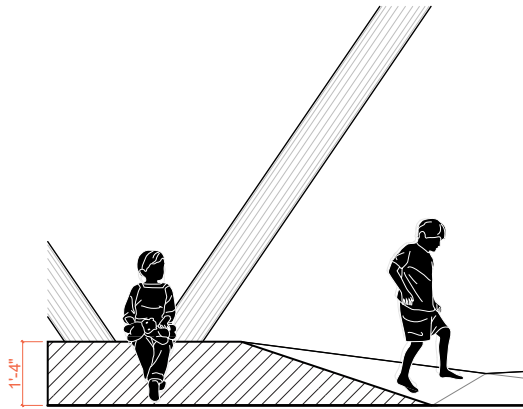


### Tree As Pattern

Inspired by timber growth rings, a computer script was developed to laser cut custom patterns into 32 steel guardrail panels. The script used several control parameters including: 'growth ring' size, count and shape to precisely generate custom patterns.



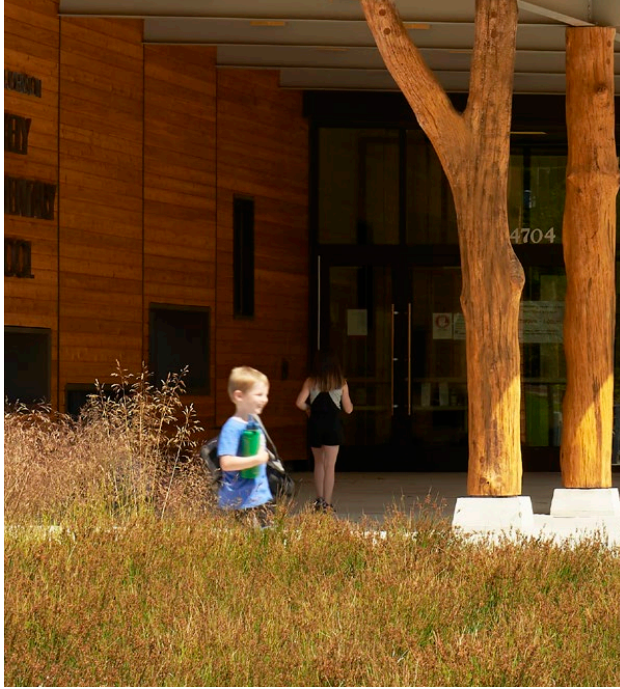




## Tactile Tectonics

Special care was taken in detailing moments of architectural engagement. Small spaces for playing, sitting, and reading are scattered throughout the project. Wood and other 'softer' materials are used to encourage sensory engagement and haptic learning. Column bases at the big stair are designed for lounging, while at the outdoor covered play they are subtly faceted with 'runnable' surfaces to engender movement and play. Vertical and horizontal building 'slots' are designed for inhabiting and exploration, and tree columns with smooth but irregular surfaces encourage touch and engagement.





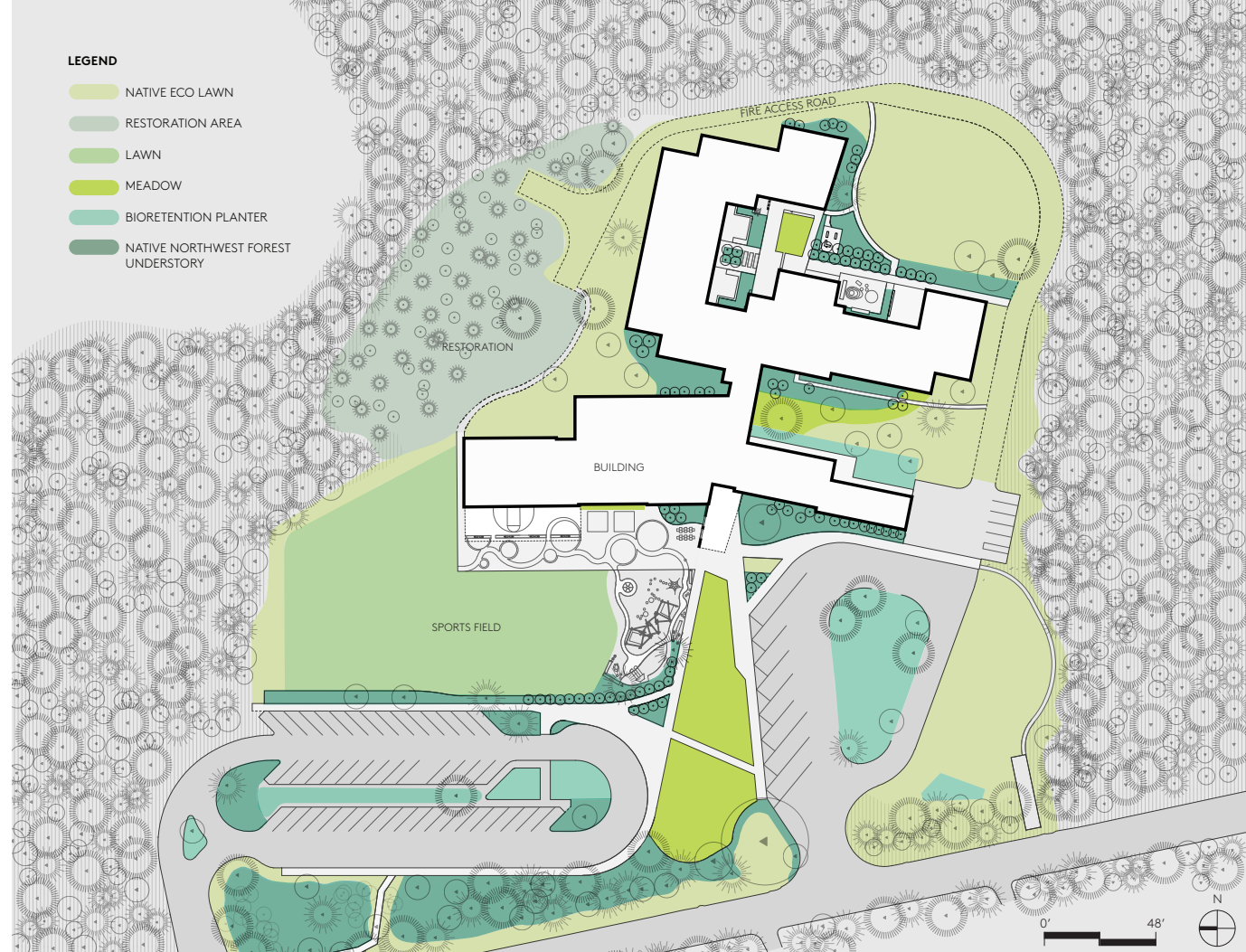
## SUSTAINABILITY + WELLNESS

The new school demonstrates high performance and advances resilience of the greater island community through ecology, water and energy systems. Student and staff wellness is supported by biophilic and physical connection to natural systems, as well as attention to healthy air and materials throughout the building.

### Ecology

An ecologically healthy site is one of the most meaningful outward signs of a sustainable school. The re-designed site for Blakely places the school in the Puget Sound lowland native forest, introduces new adapted and drought-tolerant species requiring little maintenance, filters stormwater run-off, and builds healthy soils that are the foundation of all these landscapes.

**SOILS**—Soil is a living ecosystem that nourishes plants, animals and humans. Fertile soils and compost were imported where existing soils were



Above—Planting Plan highlighting restored forest area and landscape design to support ecological function and student learning.

too disturbed or bioretention was required to improve water quality. Over an acre of the site's NE corner is within a wetland habitat buffer and 0.75 acres were converted from a sod-grass playfield to a quiet, restored forested landscape. The restoration design features native plants adapted to site conditions, which minimizes soil amendments and ongoing maintenance, and enables the site to be as self-sustaining as possible, while supporting local fauna and protecting the water quality of the nearby wetland (on adjacent IslandWood property).

**VEGETATION**—The project added more than 20,000 native and drought-tolerant shrubs, perennials and grasses selected for adaptability, limited maintenance, drought tolerance and seasonal interest. Three hundred native trees were planted on site from the human-scaled Vine Maple and Serviceberry to the soaring Douglas Fir and Red Cedar that provide habitat for numerous animal species. The new forest landscapes connect through the site and to the existing forest perimeter, strengthening habitat connections while immersing students, teachers and staff in a woodland experience throughout the course of the school day.



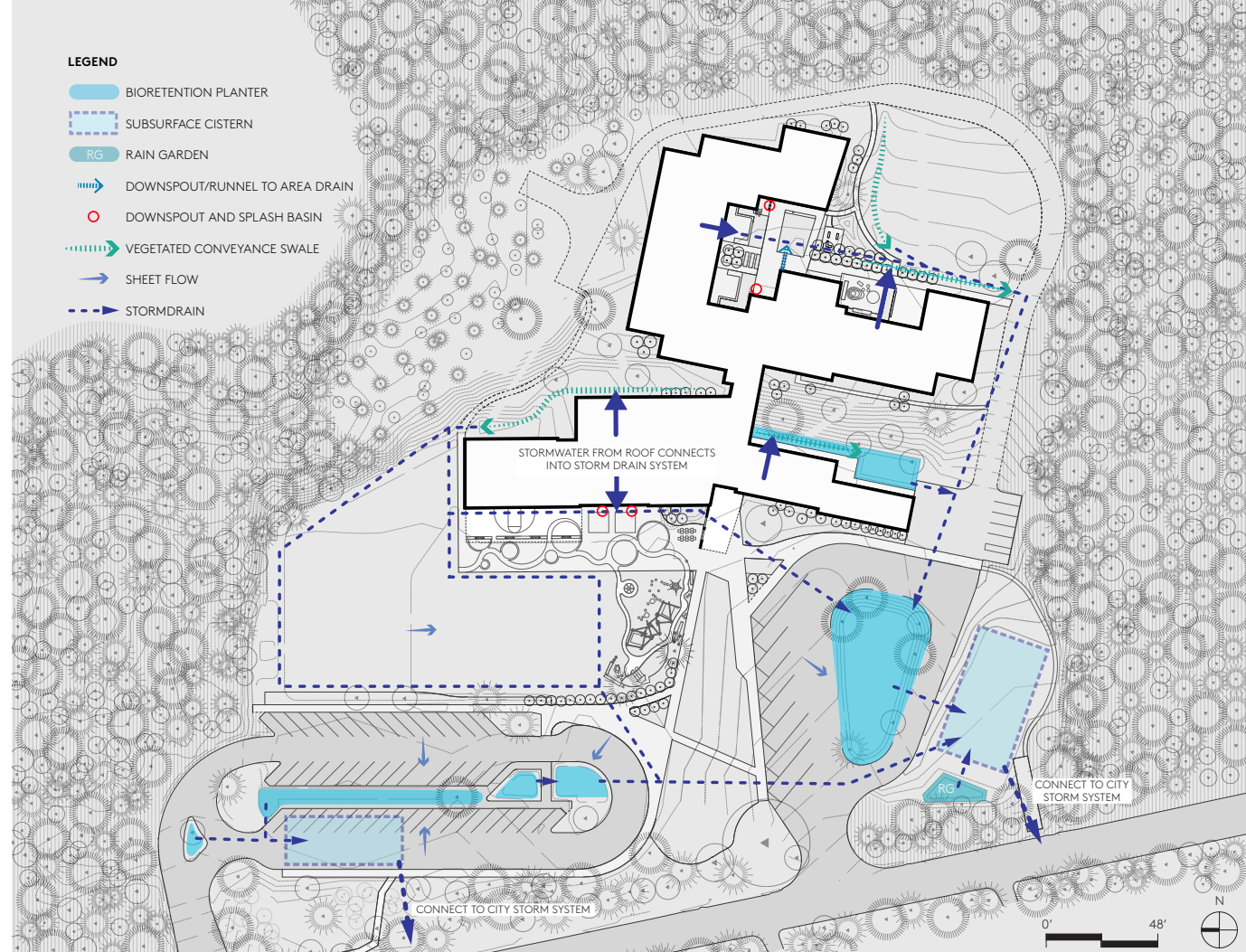
## SUSTAINABILITY + WELLNESS

### Water Systems

Water is a life-sustaining resource, yet we often treat it as an expendable commodity. Among ongoing threats to the health of the Puget Sound waterways are toxic chemicals, polluted stormwater and habitat loss.

The new Blakely Elementary School follows the best practices and current, progressive regulations for water stewardship. Rain gardens filter 91% of rainwater runoff by retaining water in soil and plants. These rain gardens overflow to subterranean cisterns that hold 380,000 gallons of water which is slowly released back into the watershed mimicking natural forest hydrology. The cleansing and retention of water on site promotes the health of Bainbridge Island watersheds and aquifers.

- Site strategies** include on-site water detention, filter strips and rain gardens. In addition, the planting design limits the use of irrigation to the driest portion of the year following overall plant establishment.
- Building strategies** include low-flow plumbing fixtures, water conserving appliances, and non-toxic maintenance practices.
- Learning Strategies:** Wherever feasible, strategies that protect water were implemented as tangible, visible, or immersive experiences, so that kids can learn about their connections to the larger ecosystem. Downspouts open to reveal the path of water to rock-filled splash basins, runnels and planters before entering the underground storm system.



Above—On-site Stormwater Management

### Highlights—

**New Native Trees:**  
300

**Protected Mature Trees:**  
18

**Building EUI:**  
32 kBTU/SF

**Building Systems:**  
All-Electric,  
Fossil-Fuel-Free

**Healthy Air:**  
Operable windows  
+ MERV 13 filters

**New Native Plantings:**  
> 20,300

**Water Cistern Capacity:**  
380,000 Gal.

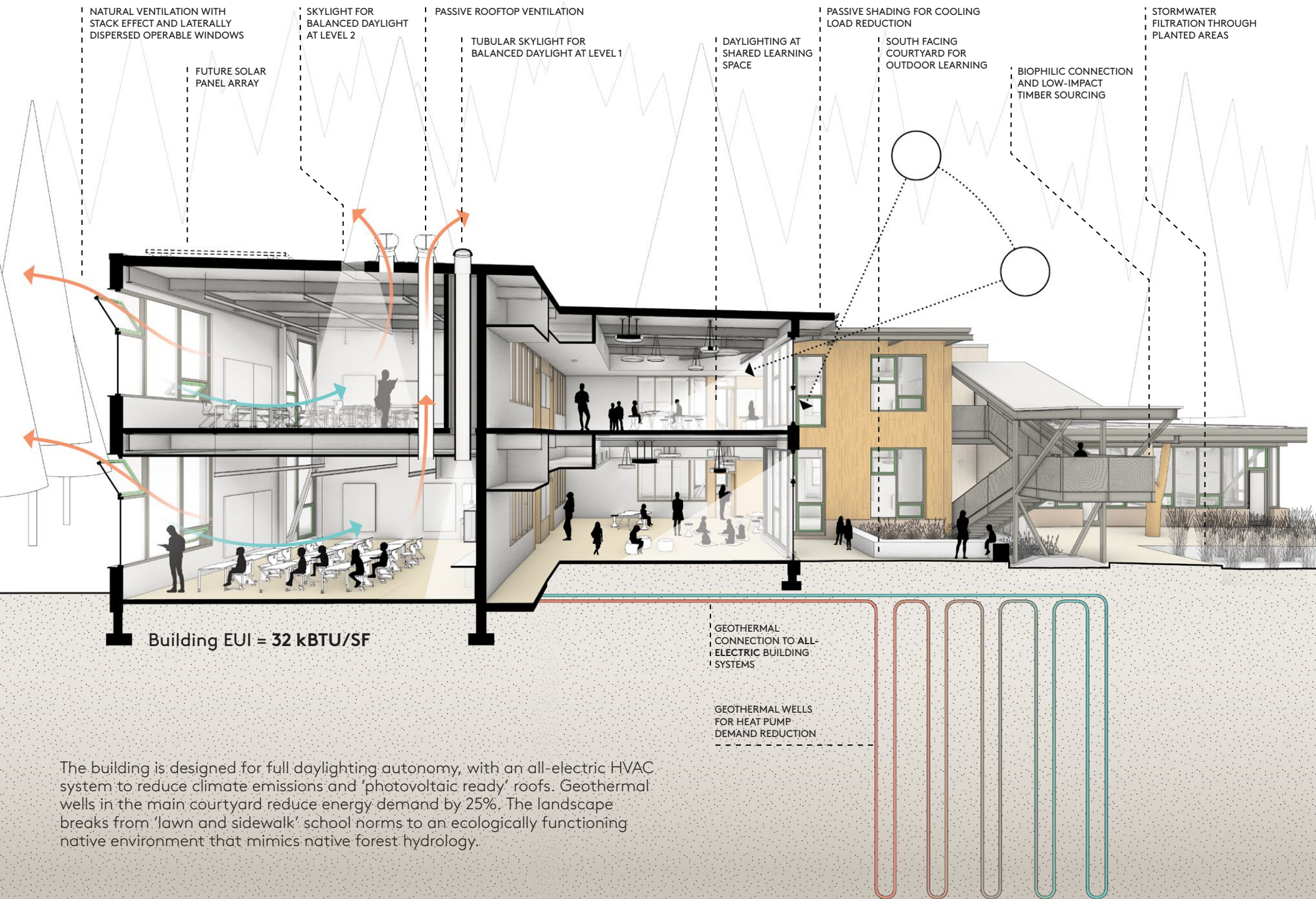
**Renewable Energy:**  
Wired for rooftop  
PV array

**Geothermal Wells:** Reduce  
Energy Demand  
25%

**Balanced Daylighting:**  
Windows, Tubes  
+ Skylights



# SUSTAINABILITY + WELLNESS



The building is designed for full daylighting autonomy, with an all-electric HVAC system to reduce climate emissions and 'photovoltaic ready' roofs. Geothermal wells in the main courtyard reduce energy demand by 25%. The landscape breaks from 'lawn and sidewalk' school norms to an ecologically functioning native environment that mimics native forest hydrology.





## Energy

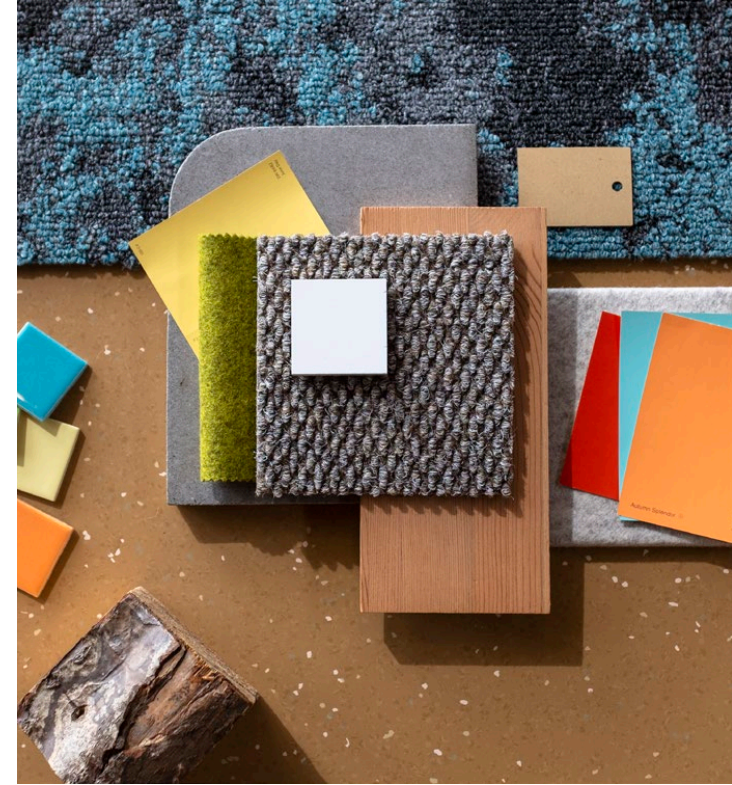
Natural daylighting and ventilation strategies have been prioritized at Blakely to minimize reliance on electric lighting and mechanical ventilation. Tall windows bring **daylight** deep into spaces, and skylights and tubular daylighting devices diffuse natural light into areas farther away from the building perimeter. In addition to saving energy, reducing costs and demonstrating stewardship, good daylighting improves academic performance and fosters a positive outlook.

The **natural ventilation** design incorporates operable windows, ventilation shafts and a red/green light system to alert users of appropriate times to use the system. Blakely also features a ground-source geothermal heat exchange that reduces energy loads by 25%. The hydronic loop, tempered by the geothermal exchange, works in combination with a dedicated outdoor air system that provides fresh and clean air to students when the natural ventilation system cannot be utilized.

**All-electric, fossil-fuel-free** building systems are designed for future grid enhancements and climate warming reduction. Natural daylight systems are paired with an all-LED lighting system.

The building is wired to accommodate future rooftop photovoltaic panels for **renewable energy** on site.





## Durable + Green Materials

The material palette celebrates the Bainbridge Island forest setting. Sustainable and durable performance were also critical factors in product selection to ensure healthy indoor air quality and ease of maintenance.

### Embodied Carbon

- Minimal use of finishes, lower-carbon materials, and use of wood elements results in a whole-building embodied carbon footprint of 389 kg CO<sub>2</sub>e/m<sup>2</sup>, with structure, enclosure and interiors attributing 235, 145 and 9 kg CO<sub>2</sub>e/m<sup>2</sup>, respectively. This beats the ILFI maximum of 500 kg CO<sub>2</sub>e/m<sup>2</sup>, and falls below the CLF median embodied carbon benchmark of 412 kg CO<sub>2</sub>e/m<sup>2</sup> for education buildings.
- **Concrete** incorporates supplementary cementitious materials including fly ash for reduced embodied carbon.

### Exterior Façade

- **Metal Siding** is the predominant façade material and was selected for mix of economy, low embodied carbon and long-term durability. The long wall at the covered play area is a **locally sourced brick**, selected for durability and long life as a bouncing ball surface.
- The durable 60 mil membrane **roofing system** features a light gray tone for accelerated drying in the Pacific Northwest climate.

### Resource Efficiency

- **Structural decking** with integrated acoustical absorption was selected to provide proper room acoustics, maximize ceiling heights, reduce need for an additional, applied ceiling finish, and to expose the building structure as a learning opportunity.

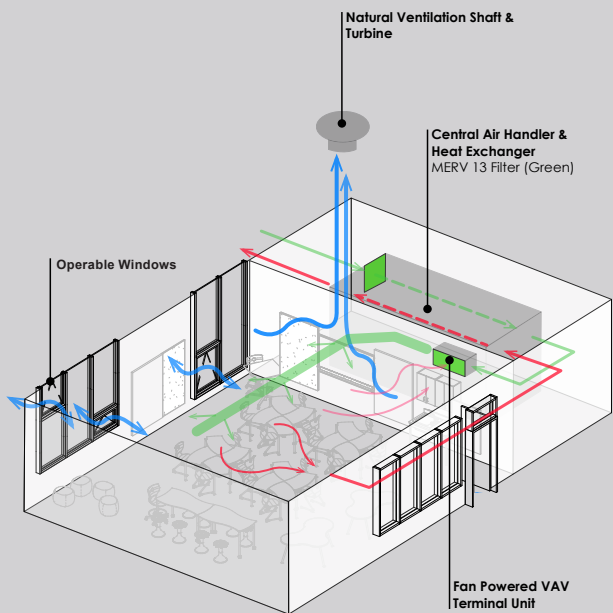
### Paint

- All paints are low- or no-VOC products.

### Flooring

- Classrooms and corridors use **nora rubber flooring** for ease of maintenance, durability/longevity, and good ergonomics in support of feet and legs. Eco-Labels: Greenguard gold, Cradle to Cradle Silver, Indoor Air Comfort Certified Product Gold.
- **Carpet** was reduced in classrooms and corridors in order to optimize indoor air quality and for ease of maintenance. Mohawk Lichen Collection Carpet Tile is used in the library and was designed nearby on Bainbridge Island, and meets the following sustainability certifications: PVC-free and Declare Red-List free.





## Health + Wellness

The COVID-19 pandemic has underscored the importance of HVAC and air quality to occupant health and community resilience. At Blakely, each classroom contains multiple operable windows, both high and low, to bring **outdoor air** directly into the classroom. Wind-assisted turbines at the roof draw outdoor air through and exhaust hotter air.

**Fresh air** from outside passes through MERV 13 filters at the central unit and is tempered with heat from expelled return air. Once the fresh air has made its way to the classroom, it is tempered based on the local thermostat using the buildings geothermal loop before being distributed to the space.

**Return air** is expelled from the building, further helping to heat incoming air through transfer plates on its way out. In response to COVID, the portion of air that is re-circulated for energy efficiency is being investigated for upgrading the VAV MERV 8 filters to MERV 13 along with the addition of a portable HEPA air purifier unit in each room.



## Biophilic Design

The school also utilizes principles of biophilia to boost occupant health, focus and well-being. Biophilic design at Blakely Elementary starts with the ecology of meadow and forest, and the celebration of trees. Window locations are designed for views to nature and optimizing daylighting, while spatial variability is woven throughout the campus—ranging from very small, low children's spaces to 30-foot-high spaces as they ascend the hill. The progression through the site from meadow to forest, while flanked by the 'whole tree' columns, is designed to heighten perception of that transition.

Daylight comes from multiple directions in all spaces to balance light levels and support variable luminance at each surface.

The design of materials for organic tactility, opportunity for sitting, and variable textures support sensory variability throughout. The geometry of nature is abstracted and interpreted throughout the building, especially in the design of the guardrails flanking the central spine, where tree slice photographs have been digitally and artisanally transferred to shadow casting patterns in the rails.



## POSITIVE IMPACTS—

### Next Generation Learning

Teaching staff report that they are actively use the shared learning spaces, which have changed their teaching methodologies and their ability to do more 'break out' learning and multiple small group activities adjacent to the primary classrooms. The connectivity between classrooms and the courtyards have enabled environmental education and outdoor learning. In addition, the library design has enabled a new set of uses and transformed how the Library Media Specialist works and connects children with reading.

### Connectivity and Flow

The building reinforces connectivity and flow through the central spine, and users feel it supports chance meetings and the openness has improved their ability to engage alternative learning spaces more than they did in the old school building. The deliberate entry sequence with visual supervision and off-hours entry/exit flow through the office reception area has improved the users sense of safety.

### Community Catalyst

The new facility's opening has been a catalyst for the school, marked by a 'tree inspired' song written by the music teacher to celebrate the opening. The chorus of "The New Blakely" highlights connections between the school and surrounding forest.

The highly visible and connected playground has been a dramatic improvement for children and families with active play and family-to-family socialization after school hours and on weekends. Parents have noted that having the playground near the entry encourages informal 'face to face' connections; it has been an active mixing area, with new relationships emerging between families that now linger rather than leave the site.

### Healthy Environment for Learning

All visitors have remarked on the daylighting and open feeling of the school and how clean the air smells. The low-emitting materials allowed instant occupancy after flush-out with improved air quality, and the operable windows work in concert with the HVAC system in times of higher air flow demand.

Dear WORKERS! Thank  
you SO much for  
Building this fabulous  
School and our  
fabulous playground!  
and doing all the  
hard work and  
planting all the  
plants for this  
fabulous school  
from LAYNEE



"Every square foot of our beautiful new library speaks volumes to those in it about how we as a community value books, reading and learning. It is as if the room says "come and read...." And the children do, in places I am not even sure the architects imagined.

When we think of our school as inspired by the forest, the library is certainly at the top with a full view of learning going on all around us while we curl up in "The Nest" to share a story. It is a very natural place to listen, to use the imagination and to wonder."

-Kathleen Pool,  
Library Media Specialist, BISD



