KATE FURBISH ELEMENTARY SCHOOL

Brunswick, ME

2024 A4LE MacConnell Award

KATE FURBISH ELEMENTARY SCHOOL

Project Name: Kate Furbish Elementary School
Location: 75 Jordan Ave, Brunswick, ME 04011
School District: Brunswick Public Schools

Consultant Team
CHA Architecture, P.C.: Architect

Bennett Engineering: Mechanical, Electrical, Plumbing Engineer

Becker Structural Engineers (now Thornton Tomasetti): Structural Engineer

Atlantic Resource Consultants: Civil Engineer

Josh Tompkins: Site Landscape Architecture

Sashie Misner: Playgrounds Designer

Cavanaugh Tocci Associates: Acoustics Designer

Tabbtech: IT/AV

Colburn Guyette: Food Service Designer

General Contractor
Ledgewood Construction

Owner: Brunswick School Department
Location: Brunswick, Maine
Project Type: New Construction
Project Size: 90,000 SF
Site Area: 11 Acres
Construction Cost: $20.3 Million
Student Capacity: 660
Occupancy Date: September 2020
Grades Housed: Pre-Kindergarten – Second Grade

EXECUTIVE SUMMARY

Kate Furbish Elementary School is the first public school that the youngest learners in Brunswick, Maine, will attend as they embark on their educational journey. While designed to support over 700 students, the building's parti is that of a "school within a school," creating smaller learning environments within the larger structure to keep learning environments intimate.

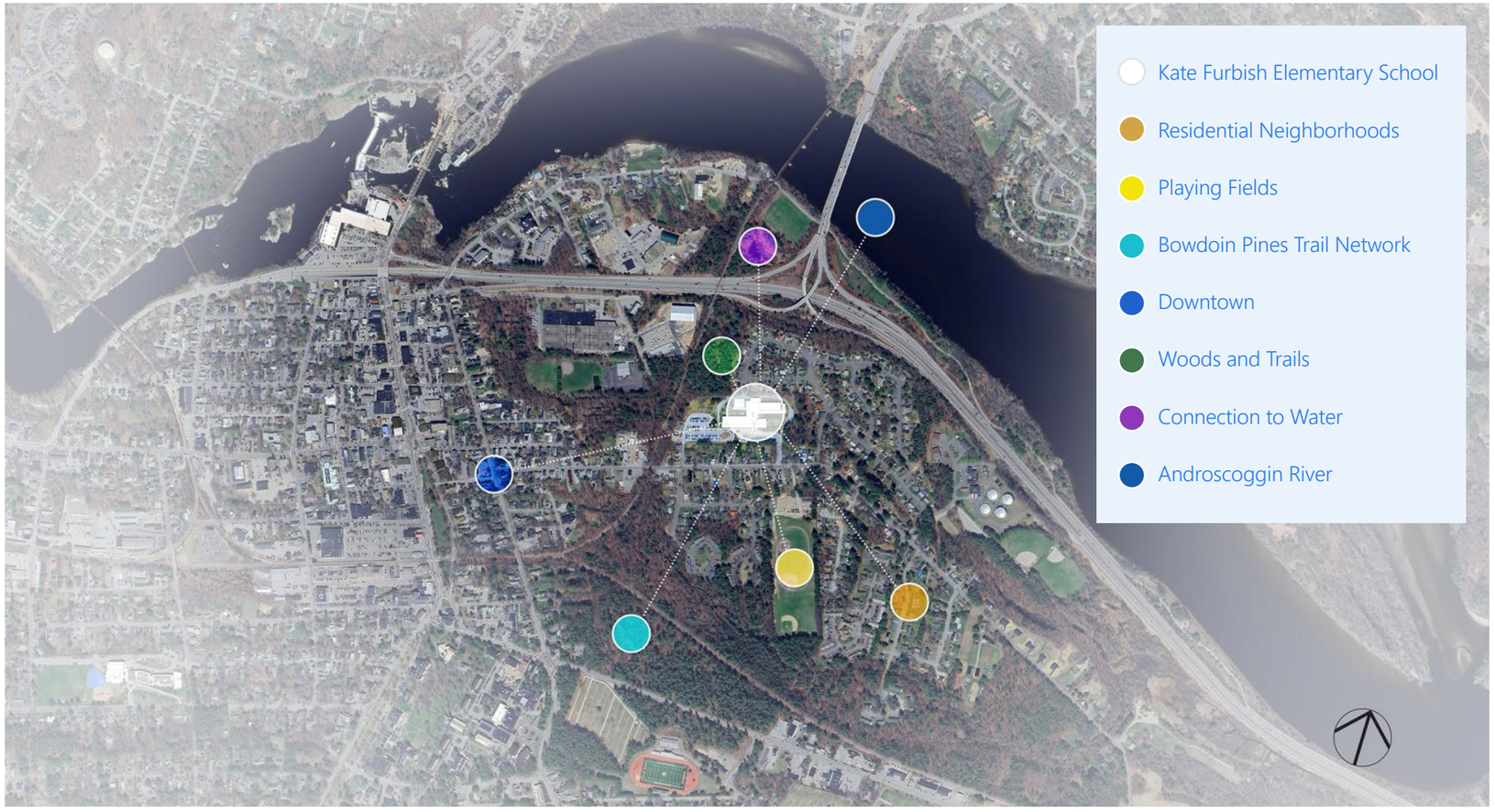
The architectural forms and colors of the design deliberately reduce the scale of the building to appeal to young students and to fit the building comfortably within the surrounding residential neighborhood. The partially wooded site situated near Maine's Androscoggin River, combined with a local naturalist namesake, provided inspiration for the building's biophilic interior design and wayfinding.

Elements from the wooded site identify each community within the building. Pre-kindergarteners are in the "Acorns and Pinecones" house. As those students advance grade levels, they move into either the "Pine & Spruce Forest" or "Maple & Oak Forest" for kindergarten, first and second grades. Connecting those classroom houses are the primary corridors known as the "Meadow's Edge" and the "River's Edge." Using imagery of nature as space identification and wayfinding allows a student body that may not yet read to navigate their way through the school.

Project Objectives

- Replacement school on site of earlier neighborhood school
- Location retains connectivity to essential community assets in Brunswick
- Relieves overcrowding at existing elementary schools, including elimination of portables
- Creates three schools within a school, sharing core facilities (300 + 300 + 60 = 660 student population)
- Provides space for pre-K program

Photography © Blind Dog Photography



THE BRUNSWICK COMMUNITY

Brunswick, Maine, is one of the oldest and largest towns in Maine's Midcoast region, approximately 25 miles north of Portland, Maine, and 120 miles north of Boston. Luminaries of American History such as Harriet Beecher Stowe, Henry Wadsworth Longfellow, and Joshua L. Chamberlain have called Brunswick home. The town's maritime heritage, shipbuilding legacy, and contributions to manufacturing have left an enduring imprint on its identity. Institutions like Bowdoin College are pivotal in shaping the community's cultural life alongside prominent biotechnical and manufacturing businesses.

The Brunswick Public Schools District enrolls approximately 2,300 students. The district maintains a minority enrollment of 20%, and 19% of students are classified as economically disadvantaged. In the mid-2010s, the pressing need for a new elementary school emerged due to a combination of unexpected shifts in demographics combined with an aging existing building stock. Ultimately, a long master planning process resulted in a clear path to a new elementary school, to be supported by the town, strategically timed to be funded and constructed between other municipal construction projects.

RESPONDING TO SHIFTING DEMOGRAPHICS

Shifting and unexpected changes in Brunswick demographics created challenges for the Brunswick School Department when settling on a long-term strategy for school disbursement. The 2010 closure of the Brunswick Naval Air Station, previously an employer of over 5,000 people enrolling numerous students in the public school system, was anticipated to seriously reduce overall enrollment in the district for both the short and mid-term future. One of the district's three existing elementary schools, Jordan Acres, was aging with less than 10 years of useful life remaining. With Jordan Acres soon to be obsolete and an anticipated smaller student body, the district decided to build one new elementary school for the town. That school, Harriet Beecher Stowe Elementary, was designed by the same firm that later designed the Kate Furbish school.

However, while the Town of Brunswick anticipated an enrollment decline due to the base's closure, the town and district were surprised by the unexpectedly fast and robust redevelopment of housing on the former naval base lands, which in turn reinvigorated the district with young students. Suddenly, all three elementary schools, including Jordan Acres and Harriet Beecher Stowe, faced a surplus of students. Combined with the pending closure (and demolition) of Jordan Acres, a crisis was brewing.

Reusing existing access points and preserving beloved features, such as pine trees located on-site, further supported the community's commitment to creating a new nature-based elementary school...

The community regathered, a master plan study was undertaken, and by 2017, the district concluded that a replacement elementary school for Jordan Acres was needed. This new facility would allow the redistribution of elementary students and would ease the strain on existing buildings. The decision to build a new school was further reinforced by the town's desire to provide public pre-K to their community. A small pilot pre-K program had been very successful, and a new building would allow for significant expansion of this program.

AVAILABLE ASSETS AND CHALLENGES

The Brunswick community embraced the reuse of the Jordan Acres site for a new school. While smaller than typical new elementary school sites, stakeholders valued the existing site's established location in the town, proximity to essential amenities, and existing integration within the community. The reuse of this site was also strategic and pragmatic. This land parcel was already zoned for an educational facility, had all necessary utilities on site, and had existing infrastructure to support car and school bus traffic through the surrounding neighborhood to the existing site. Reusing existing access points and preserving beloved features, such as pine trees located on-site, further cemented the community's commitment to creating a new nature-based elementary school where such a building had already stood for generations.

VISIONING PROCESS

A visioning process led by a highly motivated building committee engaged members of the school district, town council, teachers, staff, and parents from the district and the community at large. Collaboratively, this team prioritized creating a modern, inclusive learning environment reflective of the Brunswick community's values and aspirations. While the committee valued the existing site, they wanted a modern, state-of-the-art learning environment. Along with the design team, the committee toured eight recently constructed elementary schools throughout southern Maine to fully understand best practices in 21st-century learning for elementary students as they began to form their own priorities.

Concurrently, the design team shared multiple site-specific diagrams with the stakeholders that explored different ways to organize the school on the site. By looking at multiple organizational diagrams (grade level, schedules, etc.), the theme of a "school within a school" emerged as a method for creating the feeling of smaller schools for the community's youngest population.

COMMUNITY CONNECTIONS

By re-developing an existing site, the district could ensure that existing community connections to the site were maintained. Walking trails and pathways on and near the site were maintained and, when possible, integrated into the school's site design. Beloved pedestrian access to the site for neighborhood families remained, and a new site circulation diagram prioritized student safety by separating bus and parent drop-offs. Preservation efforts focused on retaining a stand of pine trees on the site as a nod to the area's natural beauty and as a buffer between the school and neighboring residences.

Inside the building, select areas, such as the cafeteria, are designated for public use after hours, allowing for community gatherings, meetings, and events. The entrance and vestibule in the northwest corner of the building provide direct access to the cafeteria from visitor parking, providing ease of use for community members attending public functions. Well-lit walkways and canopies enhance accessibility and safety for visitors accessing these spaces. With elementary, junior high, and high schools offering public access to multipurpose spaces, Kate Furbish Elementary School contributes to a network of community-centric educational institutions.

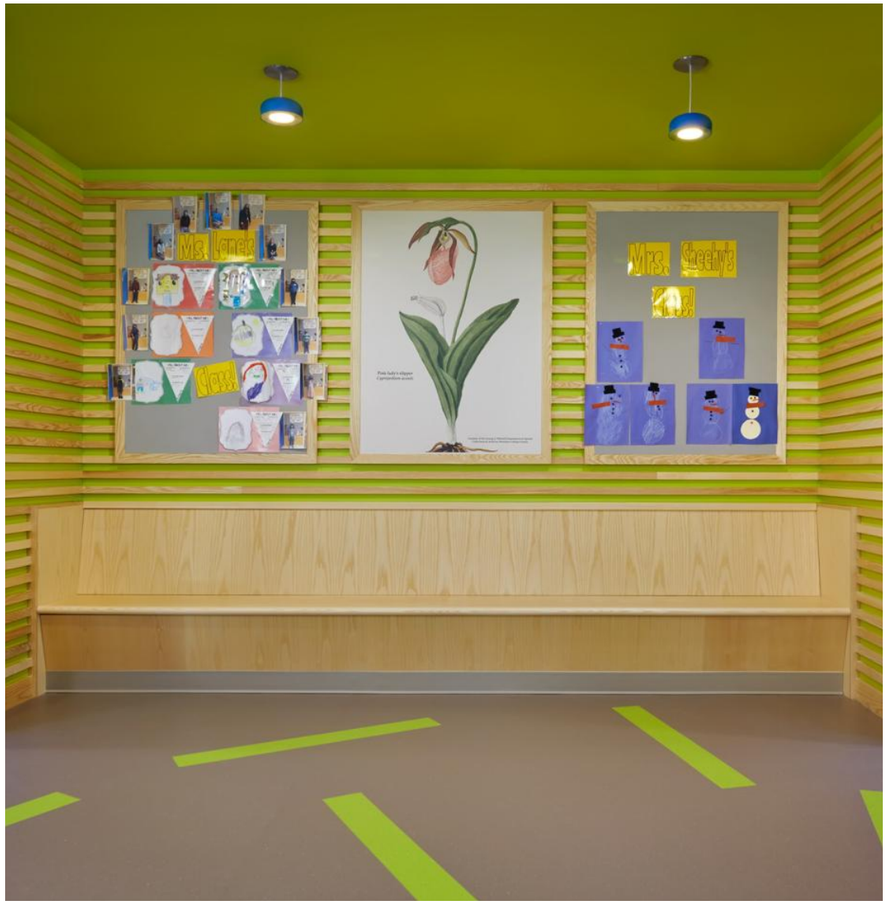
Acorn & Pinecone Trail (Pre-K)

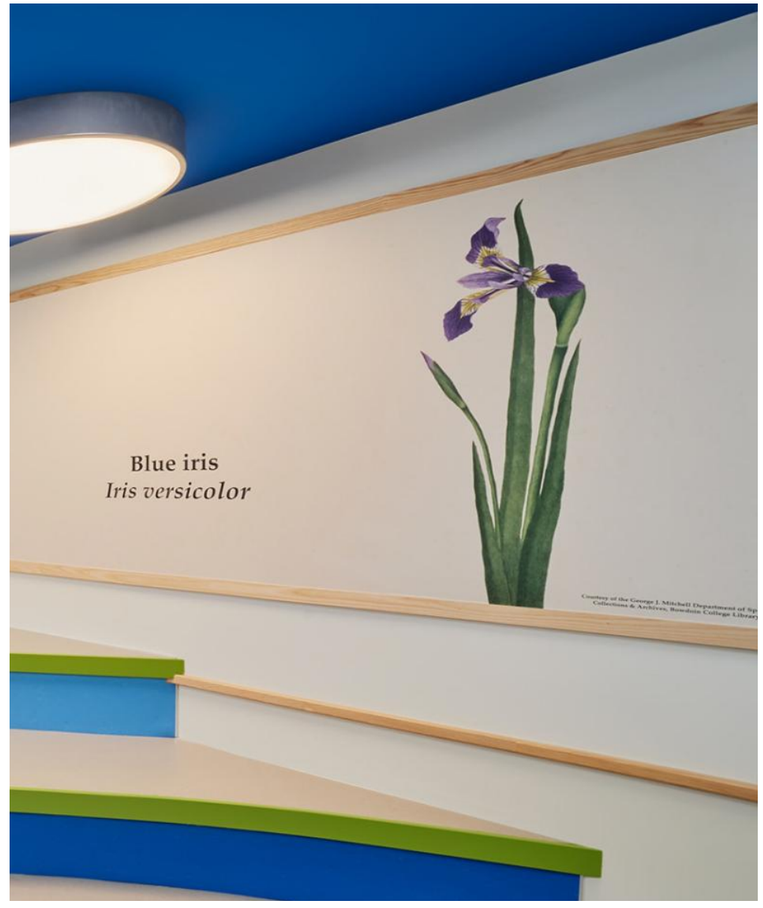
Pine & Spruce Trail (House A)

Maple & Oak Trail (House B)

Meadow & River Edge Trails (Common Spaces)

The iconography of trail markers is re-interpreted to create easily accessible wayfinding throughout the school...





INSPIRATION FROM A NAMESAKE

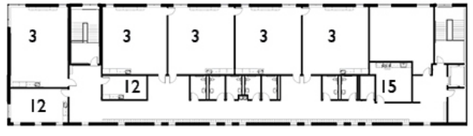
Named after Victorian-era botanist, painter, and Brunswick resident Catherine Furbish, Kate Furbish Elementary School draws inspiration from Maine's rich natural heritage. Integration of nature and nature-based education inform the school's interior design and natural playscapes, creating a captivating environment that fosters curiosity and wonder. Incorporating Furbish's artwork throughout the building is a teaching tool, connecting students to the natural world and inspiring a sense of appreciation for their surroundings. The school's biophilic design principles strengthen this connection by integrating natural light, direct connections to the outside, and organic shapes into the built environment.

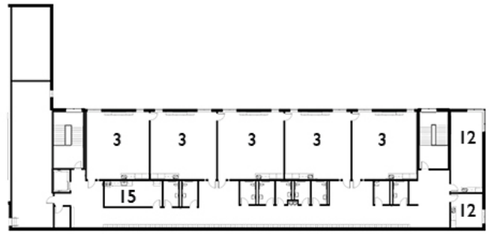
"The whole town, it seemed, was excited for the new Kate Furbish school to open but, then, COVID-19 changed everything. The new school opened but only the children could go inside. It would be two years before I would see where my children went to school. The first time I walked inside, I cried. It was so beautiful."

- Kate Furbish Elementary School Parent

SCHOOLS WITHIN A SCHOOL

The school was broken down into three smaller communities known as houses. Two houses accommodate kindergarten through second grade, with pre-kindergarten occupying a dedicated house. This intentional organization creates two smaller neighborhood schools within the larger facility, fostering a sense of belonging and community among students and teachers. Strategically, the design promotes a cohesive and supportive learning environment by minimizing the need for students and teachers to traverse between houses. Teachers and students enjoy the dual benefits of a more intimate teaching environment and access to a large-scale educational facility's shared resources and amenities.

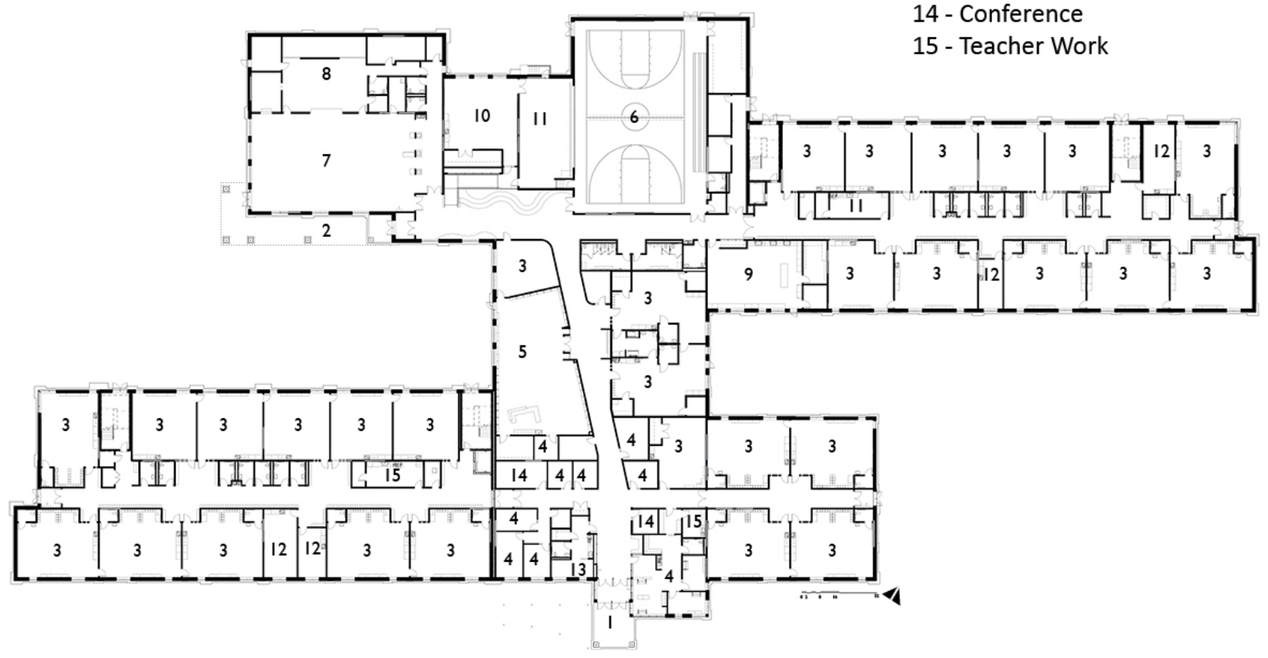


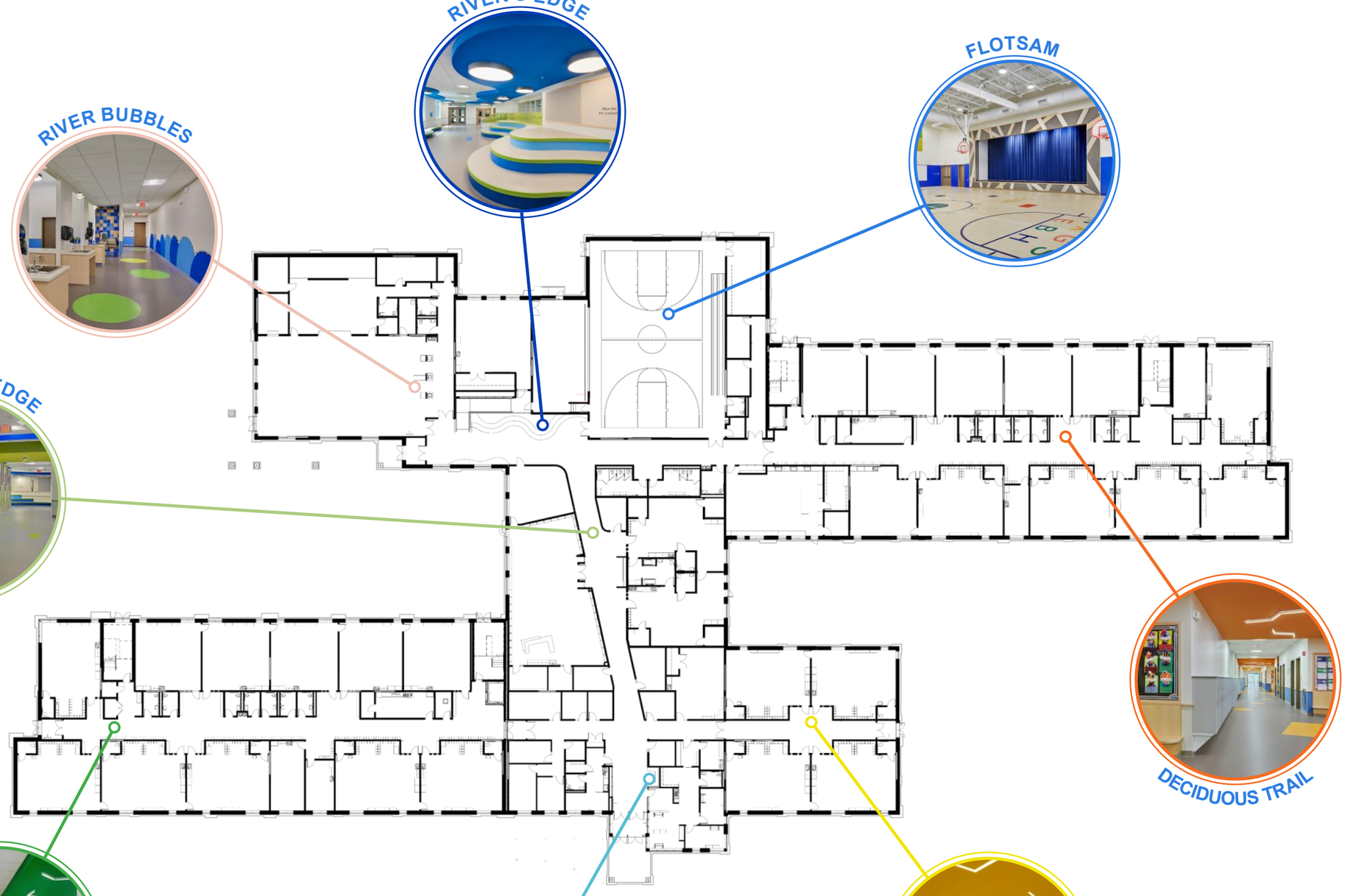


Space Key

1 - Entry
2 - Night Entry
3 - Classroom
4 - Office
5 - Library
6 - Gym
7 - Cafeteria
8 - Kitchen
9 - Art
10 - Music
11 - Stage
12 - Classroom Support
13 - Nurse
14 - Conference
15 - Teacher Work

Early Diagram of the Building Parti





NATURE AS IDENTITY AND WAYFINDING

Inspired by the natural features of the site within the Town of Brunswick and by the naturalist namesake of the building, the design team developed a nature-based parti to inform the building's interior. The identity of distinct spaces, the materials and color palettes, and the wayfinding for students moving through the building all harken back to the idea of moving along a trail to various destinations.

Each of the three classroom houses were conceptualized around existing flora on site:

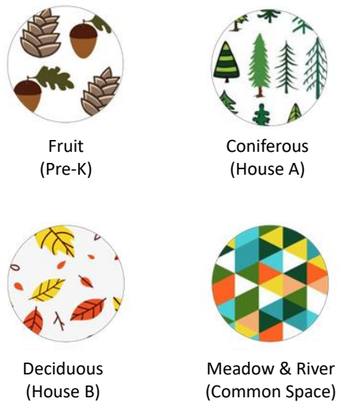
- The Pre-K house is Fruit
- House A (K-2) is Coniferous
- House B (K-2) is Deciduous

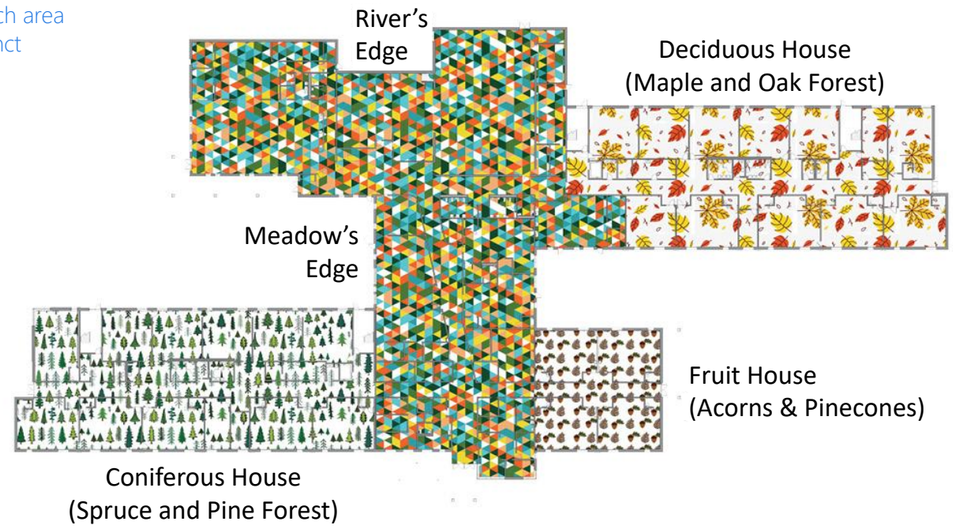
Linking these three houses to one another and the shared common areas are the "Meadow's Edge" and the "River's Edge" – each is both a pathway and contains points of repose along the way. The Meadow's Edge, identified with a primarily green, yellow, and brown material palette, meanders from the main entry to the library and beyond, depositing one at the River's Edge; the River's Edge, in vibrant greens and blues, leads to the cafeteria and gym.

The library, just off the Meadow's Edge, has a carpet pattern reminiscent of pine trees, evoking the serene beauty of nearby wooded settings. Similarly, paint colors used in the school are chosen to mimic the hues found in nature. The cafeteria, with its sweeping arches and vibrant blues, evokes the tranquility of a flowing river, while the library's mossy green tones and meadow-inspired palette evoke images of a lush, verdant landscape. The border of the stage within the gymnasium incorporates a blend of blues and browns, harkening to imagery of logs floating in a river.

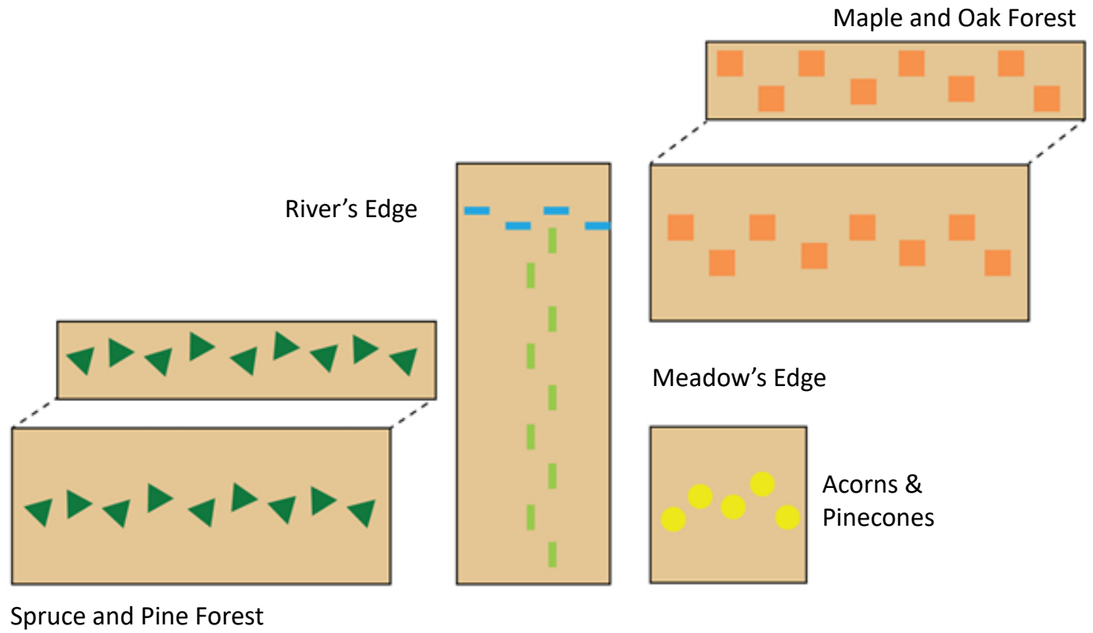
These visual and graphic clues are also incorporated into traditional school signage for easy navigation. The iconography of trail markers is re-interpreted to create easily accessible wayfinding throughout the school. Color, patterns, and imagery are used to identify houses and classrooms, appealing to emerging readers and English language learners.

Early in the design process, representative graphics for each area of the building were selected to reinforce each area's distinct nature based identity.





Interpretation of these graphics became the basis of floor patterns and wayfinding throughout the building.



LEARNING OUTSIDE

Learning at Kate Furbish Elementary extends beyond traditional classroom settings. Outdoor classrooms, an art patio adjacent to the art room, a structured courtyard, and an amphitheater space within the courtyard provide opportunities for both nature-based learning and play. Each building house has access to at least one of these outdoor spaces. The pre-K house outdoor space includes a mud kitchen and other tactile features to promote creativity and exploration.

CLASSROOMS

Classrooms are designed to support individualized learning experiences; interior design emphasizes flexibility and mobility to accommodate diverse learning styles and preferences. Neutral color palettes and movable furniture allow teachers to create personalized learning environments tailored to the needs of their students, while tunable lighting and daylight harvesting allow them to respond to the sensory needs of the students and rely on natural light whenever possible.

FURNISHINGS: DIVERSE AND FLEXIBLE

Kate Furbish Elementary School offers diverse spaces to accommodate multiple teaching opportunities and different learning styles.

Within classrooms, furnishings such as wiggle stools, floor cushions, rolling chairs, and moveable casework cater to the various physical needs of children while allowing teachers to create distinct zones within classrooms for teaching. In the pre-kindergarten and kindergarten rooms, cubbies are strategically placed inside classrooms to maximize storage and facilitate easy access to manipulatives and materials.

Practical features like benches outside classrooms for children to take off boots when coming in from recess, elevated lockers for boot storage beneath, and radiant flooring in high-traffic areas enhance comfort and functionality in otherwise busy spaces.

"Instead of low ceilings with water stains, there were high ceilings and sunlight coming through every window."

- Kate Furbish Elementary School Parent

PORTALS AND OPPORTUNITIES FOR REPOSE

In the corridor outside each set of classrooms is a gathering spot, known affectionately as a portal, designed with the understanding that younger children move in a group under teacher supervision. Gathering spots are never just a door of a corridor; instead, they serve as a point of repose, with borrowed-light windows above a bench so that students and teachers pause to have a one-on-one conversation.

Benches in the portals outside classrooms also provide opportunities for one-on-one instruction. Additional informal gathering spots are placed along the Meadow's Edge and the River's Edge to create multiple places for learning throughout the building.

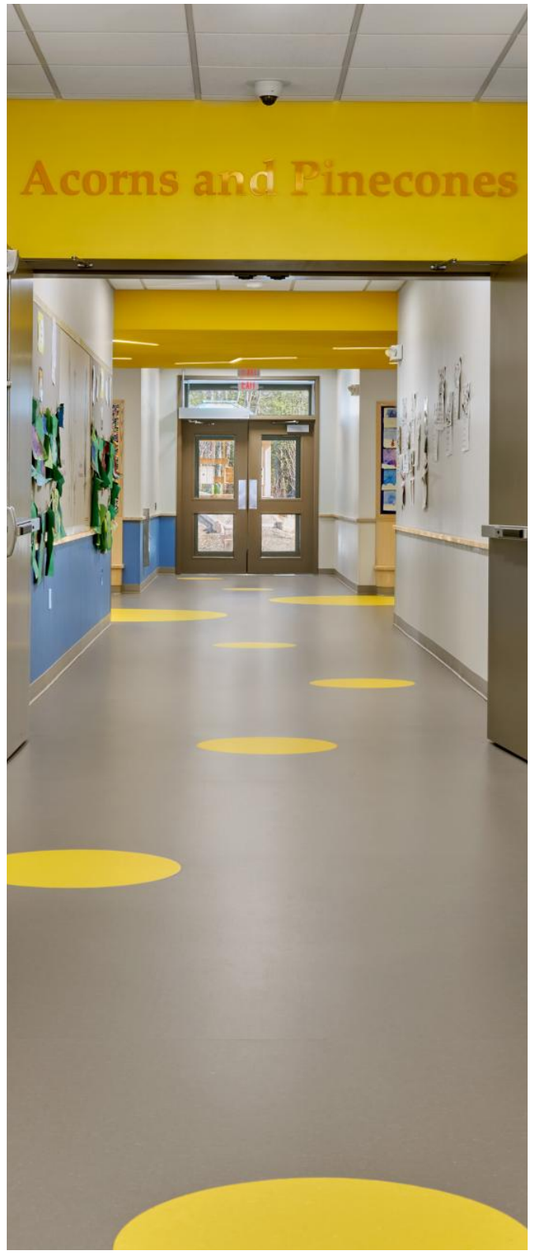
SCALE AND GRADUAL GROWTH

The school's design echoes how students will grow and move through the building. Ceiling heights in the portals are designed to "grow" with the kids.

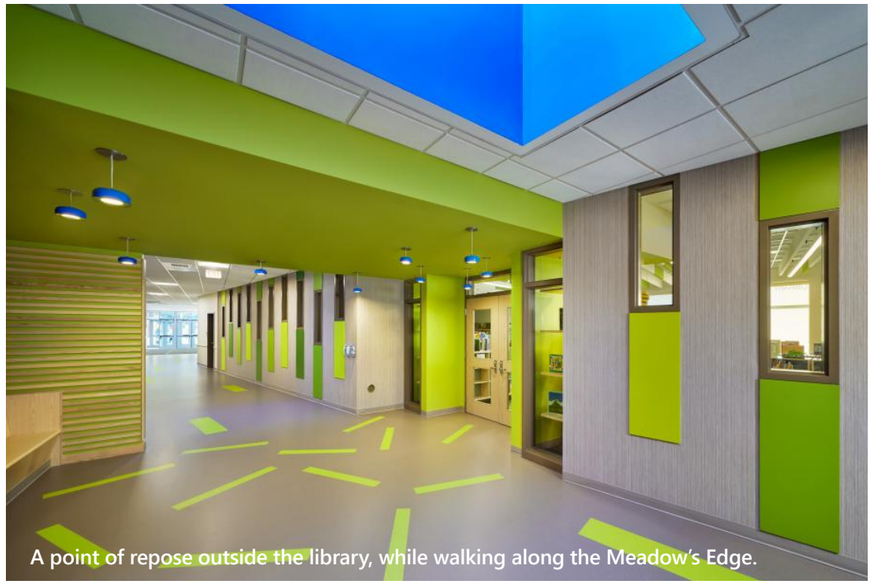
- Portals outside the pre-kindergarten classrooms are set at 8'-4" with recessed lighting in the ceiling.
- At the kindergarten and first-grade hallways, the portal ceilings are 8'-10" and light fixtures are surface mounted.
- On the second floor, which holds second-grade classrooms, portal ceilings at 9'9" with pendant fixtures reach their highest point, which is enabled by a roof truss system that allows for ample ceiling height.

Only the second graders attend classes on this 2nd floor – a treat and a sign that they are the oldest in the school.

Other design elements are tailored to the age group of the area's occupants. Radiant flooring is included in the pre-K house, where students are most likely to be on the floor, and in the cafeteria, which doubles as a discovery classroom. Pre-K rooms also have individual bathrooms within the classroom with small-scale plumbing fixtures. The cafeteria features handwashing stations and backpack hooks positioned at the right height for little kids, promoting independence and hygiene.




Photography © Blind Dog Photography



A point of repose outside the library, while walking along the Meadow's Edge.

"I love the community that the schools allow Brunswick residents to create. They might just look like a school from the outside but they really are the heart of our town."

- Kate Furbish Elementary School Parent

A gentle transition from the Meadow's Edge to the River's Edge.

FOSTERING DIVERSITY, EQUITY, AND INCLUSION

Access to outdoor learning spaces and integrated special education classrooms fosters inclusivity and community among students. By locating functional life skills and behavior classrooms within the heart of the building, students in those programs are fully integrated into the heart of the building and have smooth access to diversified spaces such as the gym, art room, and direct access to the outdoor courtyard and resources. Special education spaces are equipped with tunable lighting to accommodate sensory processing concerns, demonstrating a commitment to meeting the diverse needs of every learner.

Intentional design elements contribute to this inclusive atmosphere. For instance, a curved wall opposite the library softens the main corridor, creating a dynamic and inviting space. This architectural feature widens and narrows the corridor, providing relief and opportunities for interaction. The corridor opens up near the special education and library areas, allowing for additional seating and pull-off spaces. Additionally, special attention was given to amenities such as bathrooms and classrooms. Single-user bathrooms, size-appropriate fixtures, and accessibility features promote privacy, safety, and comfort throughout the school.

FOSTERING SUSTAINABILITY AND WELLNESS

Biophilic design elements and access to natural playscapes exist throughout the building. Daylighting and outdoor views are plentiful and are present in every learning space. Where direct access to the outdoors is not available, borrowed light, through interior glazing and skylights, ensures that daylight can penetrate corridors and interior spaces. High-efficiency building systems, such as air source heat pumps, high-efficiency windows, LED lighting, and a building automation system that responds to environmental conditions, help reduce energy demands and reliance on fossil fuels.

Additionally, photovoltaic panels installed on southern-facing sloped roofs both offset energy use and serve as a teaching moment for the students. Durable exterior materials – metal panels, masonry, and fiber cement siding – have lifespans up to and beyond 50 years. Interior finishes include linoleum flooring and carpet tile with recycled content and nonbiodegradable materials, allowing for easy replacement and low demand for maintenance.

EDUCATIONAL VISION AND GOALS

Kate Furbish Elementary School's educational vision and goals are rooted in providing a nurturing and supportive environment that caters to the needs of its young learners, many of whom are embarking on their first formal educational experience. The scale and organization of the building were designed with the social-emotional well-being of young children, as well as their academic growth, in mind.

Throughout the building, small design decisions reinforce the idea of supporting early learning and individualized support. The environment at Kate Furbish Elementary School is carefully crafted to support the curriculum and facilitate effective teaching and learning. One to two traditional intervention rooms per house creates a conducive learning atmosphere. The gymnasium, equipped with a platform, serves multiple purposes, including overflow for the adjacent music room. Custom gym floor graphics featuring clocks, letters, and numbers enhance the gymnasium's use as an interdisciplinary learning tool for teachers. Additionally, the presence of a computer lab enhances technological literacy among students.

Strategically, multiple design elements across the building are similar to elements at Harriet Beecher Stowe, the grade 3-5 elementary school that all Kate Furbish students will attend after leaving Kate Furbish. From the outside, a familiar brick palette and series of window placements aim to ease the students' transition to their next school building. Inside the building, the typical classroom parti includes windows uniformly positioned around casework, inspired by this successful parti at Stowe, and as a multi-height entry illuminated from above to create a welcoming atmosphere. While Harriet Beecher Stowe Elementary School was constructed first, efforts were made to incorporate its design elements into the lower-grade level school to reinforce consistency and familiarity across the district's campuses.

Maple & Oak Forest | Grades K & 1 Classroom Entries

Acorns & Pinecones | Grade Pre-K Classroom Entries

Educational Goals:

- Right-sizing spaces for early learners
- Aligning building elements to scale with students growth through the school
- Incorporate nature inspired material palettes throughout the interior to reinforce connections to the outdoors

Pine & Spruce Forest | Grade 2 Classroom Entries

Super graphics on the gymnasium floor promote interdisciplinary learning.

Photography © Blind Dog Photography

Tiered seating at the River's Edge provides opportunities for formal and informal gatherings.

Photography © Blind Dog Photography

Durable exterior materials will contribute to the building's longevity.

ADAPTABLE AND FLEXIBLE: LONG LIFE, LOOSE FIT, LOW ENERGY

With community and district support for a building that represented sustainable design and was responsible to the taxpayers of Brunswick, the building committee and design team were guided by a "Loose Fit, Long Life, Low Energy" mantra when making design decisions about the new building.

Loose Fit

- Minimizing fixed equipment and furniture
- Prioritizing moveable furnishings
- Accommodating diverse teaching modalities
- Providing customizable temperature controls and tunable lighting systems
- Identifying locations for and designing elements to accommodate future expansion

Long Life

- Building a steel, concrete, and masonry superstructure with light gauge interior metal partitions
- Selecting durable and long-lasting materials for the envelope
- Selecting durable and low maintenance interior materials, with carpet tiles at high-use areas for easy replacement

Low Energy

- Reusing an existing developed site and utility infrastructure
- Specifying energy-efficient air source heat pumps with variable refrigerant flow (VRF)
- Increasing the levels of the envelope from the town's code accepted minimum
- Including building automation systems to tailor HVAC and lighting to actual occupancy
- Providing photovoltaic panels on all suitable roofs to offset offsite energy consumption

Classroom palettes are deliberately left neutral, allowing personalization by teachers and students.

Photography © Blind Dog Photography

Backpack hooks on the river bubbles are right-sized for elementary school students.


Photography © Blind Dog Photography