

JAMES D. MACCONNELL AWARD

SUBMISSION



2014

Executive Summary

Trillium Creek Primary School, named for the headwaters of a creek that begins within its schoolyard, is a new school in the West Linn-Wilsonville School District. Built to serve 500 students, the school embraces multiple elements of sustainable design and presents unique features that support student learning that stem from a design process driven by students and teachers. Beginning with a community-wide "Imagineering" session, the District embarked on a journey to re-imagine what primary education would be in their district. Already having seven primary schools which were being remodeled and faced with designing two new primary schools, the District felt this was the perfect time to ensure that the built environments were supporting their pedagogical vision. A strong sense of community drove the use of interior glazing and the "see-through" design of the building. Visual connections between teachers and students reinforce the public nature of the work of teaching and learning and invite collaboration and teaming. Splashes of bright colors throughout the interior spaces originate from students voicing desires to have vibrant learning spaces. Similarly, the slide that connects students from the second to the first floor balances the students' request to have alternative and stimulating components of the building with opportunities to build skills around collaboration, mindfulness and respectful use of space. The school represents the successful culmination of an inclusive planning process with the students, district and community.

The heavily forested wetland site provided inspiration to the community to insist the building blend well into the site. Wood finishes in the library and throughout the school bring components of the surrounding forested environment into the building, while the natural colors of the exterior blend the built environment back into its natural setting. Direct access to the forest, wetland and creek ecosystems of the schoolyard support the work that teachers and student do with place-based education and providing meaningful field experiences, inquiry projects and service learning for students.

Ensuring that the students, teachers and community of Trillium Creek Primary School had an engaging example of environmental stewardship was another primary theme that developed in the early planning discussions. As a building that models environmental restoration, energy efficiencies, responsible and effective water conservation and management, Trillium Creek provides learning opportunities for students, teachers and visitors about sustainability and their impacts on the world around them to promote a better understanding of stewardship and being an agent of change.

"I want to be the captain of my own learning." -5th grade student during design charrette



Project Scope

The West Linn-Wilsonville School District passed a \$98M capital bond in November 2008 with strong voter support from the community. Enrollment figures during the 2005-2007 school years, the Long Range Planning Committee, comprised of multiple stakeholders within the community, revealed that there was overcrowding in several of the primary schools across the District. As such, the bond program featured the design, construction and opening of two new primary schools to meet the needs of two growing communities and balance enrollment at the primary level across the District.

Area: 68,000 SF
Students: 500
Floors: 2
Date Occupied: September 2012
Construction Budget: \$ 16.5 Million
Construction Cost: \$ 15.8 Million

Trillium Creek Primary School, one of these new schools, was constructed in the existing Hidden Springs neighborhood of West Linn. Trillium Creek is designed to serve 500 students with a gross square footage of 68,000 SF. The school sits on a 16-acre site that contains diverse natural elements including a wetland, forest and creek. Balancing the natural features of the site with the program requirements was an important piece of the planning and visioning stages.



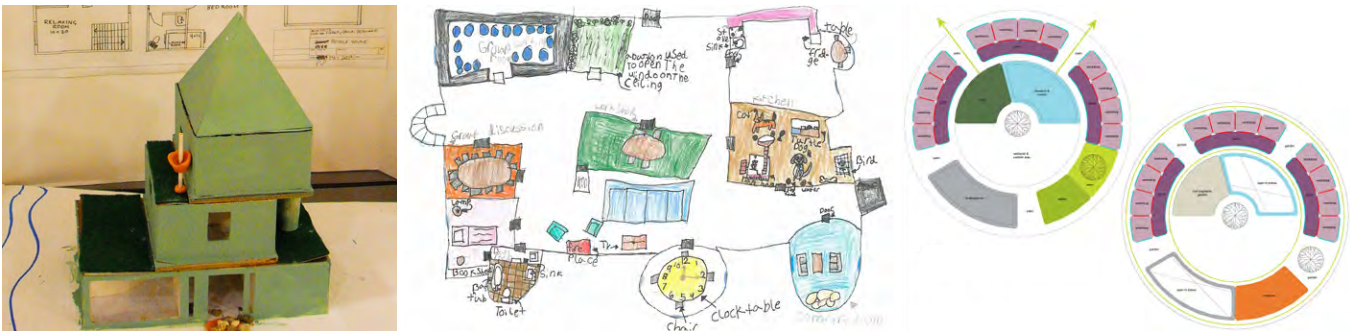
Planning and Visioning

Community Engagement Process

The West Linn-Wilsonville School District has an active and involved community who were passionate about being involved in the design process for Trillium Creek. The strong leadership of the District office was also a tremendous asset when beginning the process. The Long Range Planning Committee (LRPC) has long served to guide the growth of the school district and initially visualized the need for new primary schools as early as 2007. The LRPC, District administrators, teachers and staff shared a passion and high expectations for education and student learning in the District that shaped the design of Trillium Creek from the beginning with purpose and intentionality.

The design team took an integrative approach to the building and site design, allowing for significant collaboration and connection between all project stakeholders. Community members, parents, teachers, staff, administrators and students were able to work with the professional design team to identify project goals and guiding principles and lessons learned from existing primary schools and previous bond programs. This design committee was guided by the District's vision themes and mission statement to ensure that there were strong connections between the culture of the District and this new school.

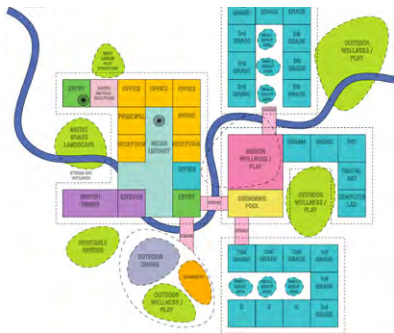
Starting in 2009, the design committee met regularly throughout the schematic design process. Meetings, workshops and site visits helped to identify opportunities and constraints for the built and natural environments and future learning opportunities for students. Virtual and local tours of innovative educational spaces throughout the region and world prompted discussions about possible building features that supported the District vision and approach to teaching and learning. The Design Committee examined many different pedagogical ideas and realized a paradigm shift was needed to help primary students adapt to the next generation learning models. The group studied a variety of learning neighborhood concepts, discussed and researched how food service and wellness could be combined and explored how the library could become more directly tied to students' learning. During these planning times, District leadership had the courage to listen to student voices to truly inform the design of the building to honor their visions and perspectives about what learning meant to them and how to best support it in a school and schoolyard. Valuing the student voice in the design for the learning spaces emerged through initial designs conversations and became a foundational principle throughout the process.



Students and the design committee completed design charrettes where primary themes materialized around nature play, open spaces, bright colors, energy conservation, personal space, connections to the outdoors and students wanting to be the captains of their own learning. This notion, introduced by a fifth grader involved in one of the charrettes, continued to inspire the designers throughout the design, construction and opening of Trillium Creek. Embracing the concept of student ownership of learning spaces pushed traditional thinking about instructional spaces and allowed the design team to incorporate small, private learning places throughout the building.

The following design themes emerged from these conversations, charrettes and the schematic design:

- Conservation and celebration of water
- Sustainability
- Student centered learning spaces
- Colorful and engaging environments
- Multidimensional library as the center for research and inquiry
- Collaboration and community
- Connections to nature



Planning and Visioning

Turning Site Challenges into Unique Student Learning Opportunities

There were numerous physical challenges presented by the natural features of the chosen school site. Purchased in the early 1990s from a family who historically used the property for orchards and small-scale agriculture, the District always intended to construct a new primary school on the site when the City's growth demanded. The site includes a significant Douglas Fir grove, forested wetland and the headwaters of Trillium Creek, a tributary of the Willamette River. Conversations during the design process reiterated the importance of preserving and protecting the natural environment and site's unique features. There was a consistent desire to restore the wetland, creek and existing Douglas Fir tree grove, which had been overrun with invasive vegetation over the years, as a model of environmental stewardship. Using the site as an outdoor learning environment to integrate nature play, place-based education around diverse ecosystems and effective stormwater management was critical for teachers and administrators considering the unique student learning opportunities the site presented.

The natural environment, wetland and creek became central to the design challenge. Given the amount of rain that falls in the Pacific Northwest, the design committee quickly identified the connection to water as a key theme. Wanting to ensure that students, staff and community were constantly aware of the presence of water on the site and its conservation drove major design decisions on roof form and features that celebrate the rainfall and collection. A rainwater catchment system located a 15,000 gallon cistern directly under the main entry courtyard and channeled water to it through vertical and horizontal runnels that demonstrated the flow of water all the way from the roof, to the runnels, to the cistern, to the bioswales and through to the creek. In addition, the design team conducted an in-depth site analysis to determine the most efficient and lowest impact approach to accommodate the unique site conditions. Crossing the creek and wetland at the narrowest portion reduced overall impact, while also allowing the design team to meet the site programming. Students are able to understand the process of wetland mitigation and restoration as a result of the construction and placement of the school as a unique learning opportunity and connection to real world planning efforts.



Planning and Visioning

A Culture of Excellence and Leadership

The District had strong assets at the onset of the planning and visioning stages given their culture of educational excellence and leadership. District support and vision around sustainability and the District mission question created strong expectations for the impact Trillium Creek could have on learning communities across the District. The value of this process and project was important to the community at large who viewed the design, construction and opening of this new school as a recommitment to the importance of schools and education, values embedded in the community's culture.

West Linn-Wilsonville School District's mission is intentionally a question that asks, "How do we create learning communities for the greatest thinkers and most thoughtful people . . . for the world"? It is through the exploration of this question that the design process was formed. District leadership has long believed that a capital improvement bond is a great opportunity to explore this question and hold community-wide conversations on the re-imagining of their schools. Beginning with a series of summits in advance of the bond, the District worked closely with their community to identify key needs and visions for the advancement of the educational delivery within the District. After passing the bond, there was a District-wide "Imagineering" session where over 160 teachers, administrators, students, city officials and community members were led through a series of exercises to dream about what key aspects they would like to see in their new schools.

The programming and planning phase focused equally on pedagogical paradigm shifts and the physical environments to support them. District leaders worked with school principals and instruction and curriculum folks to examine project based learning instruction and personalized learning models. Ensuring that every student received the tools they needed to learn and thrive became a guiding principle for the District.



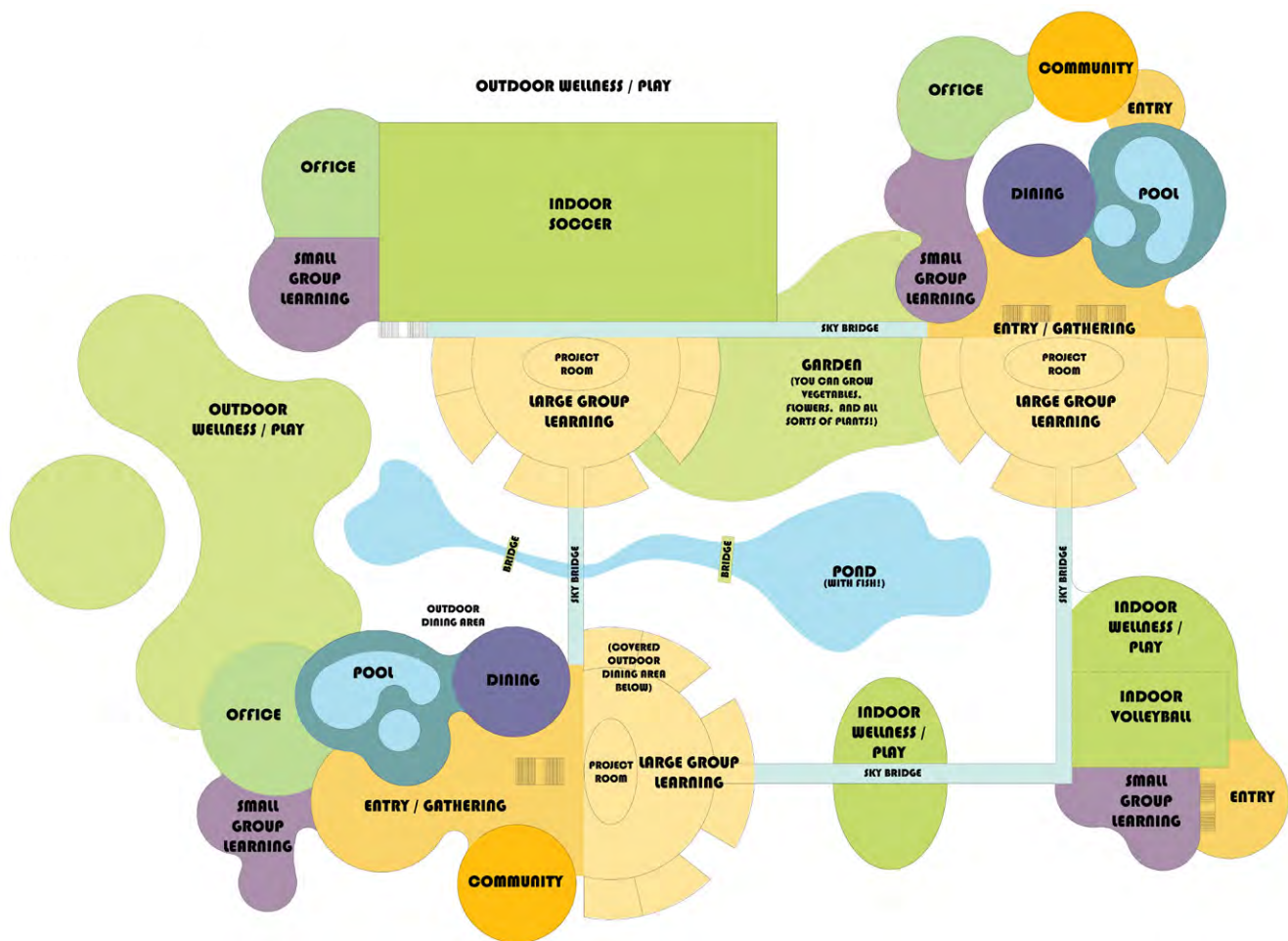
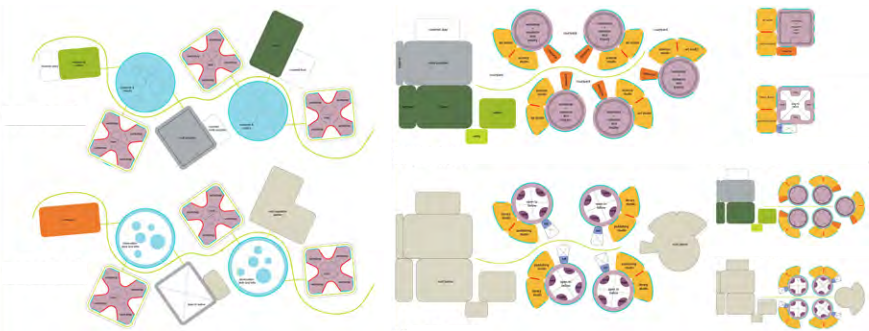
Education Environment

Learning Neighborhoods

The design committee valued the importance of the student voice in the design of the school. Considering students' desire for open spaces, bright colors and natural wood and materials informed the final design for the learning environments. Balancing these designs with the District's curriculum and instructional practices was important to meet the program needs described by teachers and administrators. Creating opportunities for collaboration, small group work and learning, and flexible learning spaces to accommodate a variety of activities and learning styles was critical to the success of the design.

The learning neighborhoods consist of porches that open to clusters of either four or five classroom spaces. These porches are flexible in nature, allowing students and teachers to utilize the colorful, carpeted environment for a variety of large or small group activities. Students and teachers can transform these spaces with mobile casework and furniture whether they are using them for eating lunch, conducting small group meetings, presenting student work or accommodating independent student learning.

Classrooms are also designed to give students and teachers the ability to shape their own learning environments with mobile furniture and limited built-in casework. The "Fat L-Shape" design of the classroom provides opportunity to separate the variety of classroom activities without permanent barriers. Each classroom in the school also features an "oriel" that extends from the building and presents an independent learning place for students, giving the feeling that they are suspended in the outdoor environment. Children can also easily identify their classroom from all around the site from the oriel's bright colored tiles that blends back into the classroom to further blur the lines between interior and exterior spaces.

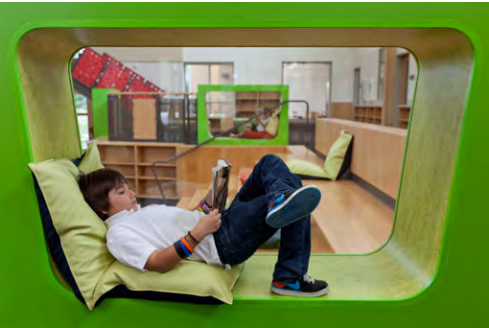


Education Environment

Multidimensional Library and Inquiry

A key theme that developed in the early visioning phase was the concept of creating a “multidimensional” library that was more than the typical destination primary students would visit a couple of days a week as part of their “specials” schedule. The intention rather was that the library would become part of the student’s every day journey as they traveled throughout the school. Its location, proximate to the learning neighborhoods, ensures that research and inquiry is able to be part of the student’s daily experience. Creating transparency and lines of sight were critical to ensure the seamless transition between the classroom, extended learning areas and the library to allow teachers to feel comfortable with sending their students beyond the walls of their traditional classroom to gain the knowledge they need. The multidimensional library is designed to be the living room of the school and the center for research and inquiry. The open floor plan provides inherent flexibility for student and teacher use and offers a variety of learning environments.

The “tree house” perched on the second floor allows students to meet in small groups or have a quiet space for independent learning. Its natural wood finish and bright colored features are beacons of the student-centered design of the building. Students can return from the second to the first floor of the library via an enclosed slide. While the chocolate rivers and zip lines included in the student design concepts appeared to be frivolous in nature at first pass, the design team engaged the students in deeper explorations about the desires behind these fun features. Students expressed that there wasn’t enough fun and wonder in their school experience and were looking for ways to introduce those concepts back into their day. The addition of the slide in this central and prominent space truly represents the great extent to which the design team went to create a place for kids to experience fun and excitement in their school day, which was based on early design charrettes that were part of the planning process.



Education Environment

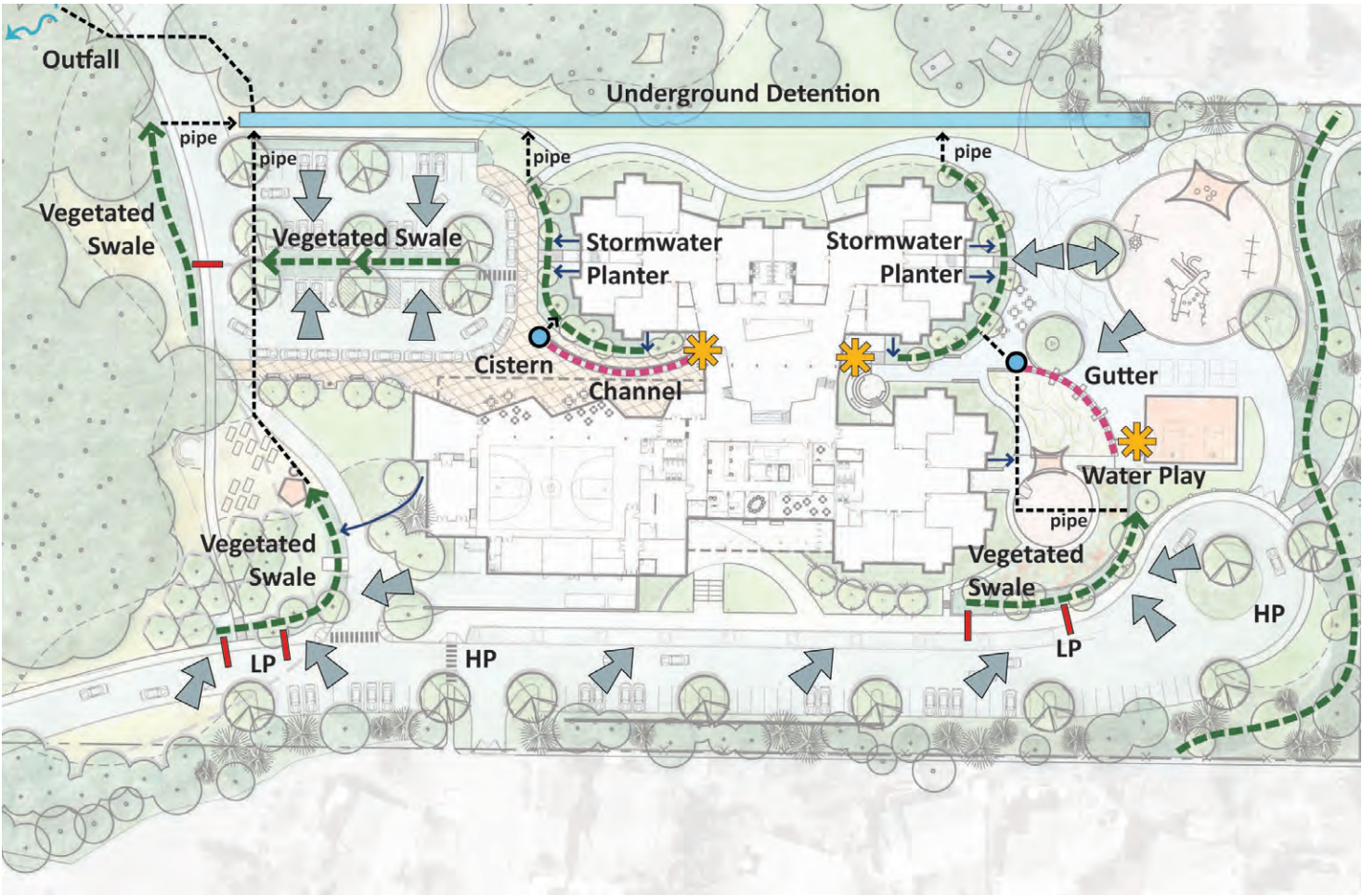
Sustainable Features

Another key theme that developed during the visioning phase was the desire to tie sustainability closely to instruction as a way to teach students, teachers and the larger school community about environment, economic and social sustainability. Students and teachers are invited to interact with the building and its sustainable features through three primary educational tools integrated into the design of the building:

-LED energy meters, installed at the entry of the four learning neighborhoods to the north of the building, provide information about the building's daily electricity, natural gas and water consumption and the production from an on-site PV array and wind turbine. By linking this with information from the weather bug station on the roof, students and teachers have the ability to develop various ways to collect, track and analyze the link between weather and the impact to the consumption and production of resources. The architects have continued to work closely with teachers to develop ways in which these meters can be used in science and math instruction.

-Green indicator lights in the classrooms are tied to the building's energy management system and turn on to inform students and teachers when opening or closing windows and shades in the classroom is more optimal for energy conservation. While there are locations in the building where windows open automatically in these conditions, the automatic function was intentionally not provided in the classrooms. Rather, these lights make the students have to consciously participate in changing their physical environment to respond to the changing climatic conditions. Students have taken this charge to heart and are so excited to open their windows and conserve energy.

-Plaques and signage within the building provide cues and draw attention to these features, connecting to the larger green building education curriculum integrated into grade level studies. The District and architect provided two full day orientation sessions to teachers prior to occupancy to review this signage and the systems to ensure that staff was using the building as intended and understood the design and sustainable aspects of their new home.

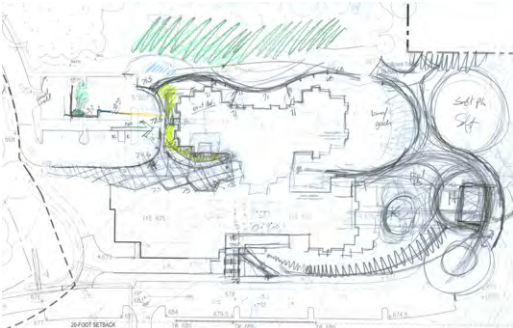
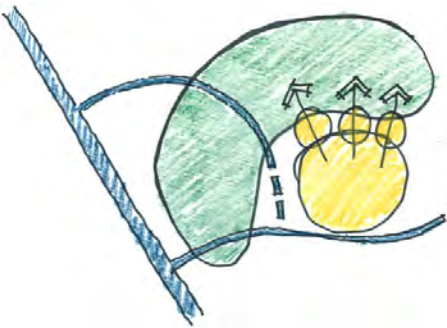


Education Environment

The Natural Environment and Collaboration

Another key desire expressed by the community was to connect the building to its rich site nestled in a heavily forested wetland, the location of the building was determined after a long master planning phase where multiple options were studied. The immediate neighbors and the larger community were invited to an open house on site in the early phases to review the options and comment on which ones worked better to blend into the neighborhood. The administration, wellness and kindergarten wings are elevated four feet to allow for a visual connection through the library to the natural settings outside. It was important to provide visual throughways to the outdoors from all locations inside the school. The transparency in the building intentionally supports teaming and collaboration between teachers, students and staff. Large interior and exterior windows promote the public nature of the work of teaching and learning, inviting the entire school community to actively participate. The natural wood finishes and direct connections to nature blur the lines between the built and natural environments and facilitate the learning opportunities for students within the unique schoolyard. Stairs from the second floor connect the upper learning neighborhoods directly to the forest and path to the creek and wetland. Exterior doors from the lower neighborhoods provide direct connections for first floor classrooms to the schoolyard as well. Two outdoor learning classrooms on the second floor provide examples of green roof succulent plantings, while also providing raised beds for student driven plantings and experiments that extend classroom learning outside.

Since the community held the preservation of the wetlands as a very high priority, the design team worked with the District to employ a shepherd to bring her flock of goats to remove the evasive species in the wetlands prior to the start of construction.



Education Environment

Learning and Teaching

Since the bond included plans to remodel all of the existing primary schools in the District, the work done in the design committee focused initially on how to transform the educational delivery at the primary level. The nature of teaching and learning was reevaluated and District instruction and curriculum staff walked the design committee through new rubrics that represented to move to the common core. It was essential that the educational environment supported a variety of learning and teaching styles with its flexible spaces and student owned learning places. Mobile furniture is placed throughout the building so students and teachers can shape the spaces to support a variety of activities and learning styles. In addition to the classroom oriels, small nooks and cubbies are dispersed throughout the school to support small, independent learning. Designated private study spaces accommodate the school's diverse student population and help individualize their learning by providing a variety of environments to meet their needs.

Part of the exploration that led to the design of the learning porches was a design initiative developed in conjunction with existing fifth grade students in two of the existing primary schools. These students worked with the architects and their teachers to learn Google SketchUp to design their ideal learning neighborhood. They identified their learning styles and researched what types of spaces would best suit these styles. The architects further developed the ideas and brought them back to the larger design committee for additional dialogue and analysis. Many different configurations of the learning neighborhood were explored as were the connections between the neighborhoods and the library.



Physical Environment

Forests, Water, Wetlands and Stewardship

Considering the primary design themes of sustainability, connections to nature and protecting the natural environment, the design team ensured that it maintained a strong connection between the students and the schoolyard. As such, the circulation and parking is located to the south and west of the school. Nestling the building to be directly adjacent to the forest allowed for direct connections between learning spaces and the dominant site features of the physical environment. In addition, learning gardens to the west of the school and roof top gardens on the building's second floor also provide spaces for students to connect their learning to the physical environments around them.

The site design embraces the celebration of water as it was a critical theme identified by both the adults in the design committee and the students. As an important regional priority, the stewardship and conservation of water were integral design themes. The integrated stormwater system is intended to provide a learning opportunity for students and an educational tool that helps to tell the story of how the water is drained on the site. Passive drainage through runnels, water channels, gutters, and trench drains allows students to follow the water that flows off of the school's roofs or impervious surfaces along its course back to the creek.

The design of this system is intentional and steers away from typical catch basin systems that conceal this educational process. Following its exposure through runnels and bioswales adjacent to the building, rainwater is harvested, stored in an underground cistern and used inside the building to flush toilets. Signs on the interior spaces of the building tell this story and connect these building systems to the educational learning opportunities the building facilitates. Students can make deeper connections between the building's water consumption by comparing the LED energy meters on the inside of the building with the exterior cistern rain gage that displays how full the cistern is following precipitation events. The responsible management of stormwater is an important piece of the place-based education curriculum that connects students to their schoolyard and the health of Trillium Creek that flows through the on-site wetland. This stewardship is important within the context of the educational programs, but also the larger context of the community which values restoration in the City's natural spaces and within the Trillium Creek watershed.

Built within an established neighborhood on a site historically used for open space prior to construction of the school, the site design highlights these natural features and provides walking paths and connections for the community to use the site for exploring the forest and wetland. The school welcomes walkers and bikers from the surrounding neighborhood with pathways that wind through the forest and wetland to immerse students, teachers and the community in the natural landscape.



Physical Environment

Conservation and On-Site Renewable Technologies

An all-day sustainability charrette was held in the programming phase to identify the sustainable vision and establish guiding principles related to environmental sustainability. Students and adults alike identified the conservation of resources as an important goal early in the design process. Intentional and subtle design features contribute to the building's operational efficiencies and sustainable features. The building's orientation, on an east-west axis, increases the potential for daylighting strategies and captures solar heat during the winter months, while reducing excess heat gain in the summer. The light color of the roof, constructed with a light, single ply membrane, minimizes the heat island effect, a condition that occurs when dark, non-reflective surfaces trap surface temperatures in urban areas. In addition, efficient heating, ventilation and cooling (HVAC) equipment installed on the roof and interior spaces exceed energy performance requirements as part of the school's quest to become LEED® certified gold.

Students, teachers and visitors to the site are presented with examples of energy conservation and on-site production that are integrated subtly into the building design. Ultra-efficient water fixtures and waterless urinals, coupled with the use of rainwater as the primary flushing source, minimize the amount of water used onsite.

Daylighting and natural ventilation in the classrooms and common areas enrich productive learning spaces. Native plants that complement the existing site conditions and help to enhance the wetland features that dominate the landscape are constant reminders of the importance of the site context.

A photovoltaic array on the covered walk that leads to the bus loading zone and student entry generates electricity. That, coupled with the vertical wind turbine adjacent to the learning garden, demonstrates renewable energy technologies.

The library's multi-level design and high windows in the building monitor captures daylight throughout the year and reduces the need for artificial light. Motorized windows in the library and wellness commons open and close automatically based on outside air temperatures and optimal energy efficiencies. Similarly, lighting fixtures throughout the building that are adjacent to exterior glazing have sensors that automatically dim the lights to capitalize on natural light while maintaining occupancy comfort and reduce overall energy consumption. The building's efficient HVAC system is tracked through a central direct digital control (DDC) system that allows for constant monitoring to maintain efficiencies.



Regional Baseline EUI 58
Trillium Creek actual EUI 33.9
42% Improvement



Physical Environment

Learning Communities for the World

The District mission question states: How do we create learning communities for the greatest thinkers and most thoughtful people. . . for the world? Designing a building that would continue to inspire its learners was critical to the success of the project. This notion pushed the designers to provide connections for students and ways to interact with the building and schoolyard to better understand their impact on the world around them. Modeling sustainability through intentional site design, native plantings and restoration, water conservation and management, and connections to the natural world inspires place-based education curricula that teaches students about the world around them and their role as environmental stewards.

A concept that emerged from the District and its educational programming informed the final stages of opening the school. As opposed to thinking of the school as finished on the first day of school, the District adopted the thinking that when the building opened it would be 98% complete, leaving the final 2% for the students to finish with the display of student work and learning that inspires and motivates peers and students to make learning visible. That design principle inspired the installation of boards and reusable frames along the staircases and in the learning neighborhoods to facilitate this dynamic display of student work.

Upon completion, Trillium Creek applied for LEED® certification and received Gold Certification. The community identified this as an important goal early in the design process as a way to recognize the work of the designers, contractors and educators to successfully build an energy efficient, environmentally conscious and unique learning space that continues to educate students about sustainability. The community saw that achieving this benchmark would motivate and inspire the District and the community at large to continue to embrace these green building strategies, technologies and education through the common language of the LEED rating system.



Results of Process and Project

Trillium Creek successfully achieves the educational goals and objectives described by the District during the planning and visioning stages. Students are presented with flexible spaces that allow students and teachers to cater the space to meet the needs of diverse learning styles and activities. Student voices are valued in the spaces that champion student work and the display of learning. Connections to the natural environment provide unique outdoor learning spaces that foster and supports curriculum around environmental stewardship, restoration and place-based learning. These opportunities allow students to continue to tell the story of their school and its natural features.

Trillium Creek also achieves larger District goals and themes. Connecting to the notions of learning communities for the world, students at Trillium Creek can connect to other students around the world through integrated technologies that support global communities and embracing world languages. The District saw a great opportunity when opening Trillium Creek to revitalizing the teaching and learning across the primary level.

The design and support of educational programming at Trillium Creek informed a rededication to supporting inquiry, science education, a sense of wonder and place-based education across the District. The themes and design principals that emerged and are reflected in Trillium Creek's finished building challenged District administrators, teachers and staff to think about learning, collaboration, sustainability and health and wellness across the District.

As a neighborhood school, the existing community that envelops Trillium Creek's site embraces the building and schoolyard that provide opportunities for community involvement and shared spaces, protected natural spaces and a culture that promotes exploration and wonder. The community's primary goal to balance enrollment at the primary level across the District was met by the building capacity of the school. More than that, however, their goals around sustainability and community partnerships are realized in the demonstration of sustainable building strategies and features and flexible spaces for shared community use in the building and schoolyard.



The design of Trillium Creek and the learning opportunities created by the school and schoolyard empower students to be agents of change. The global perspective and emphasis on collaboration and critical thinking of the District's mission was at the core of the design and successful opening of Trillium Creek Primary School. The intersection of green building design and Education for Sustainability was evident in this story and continues to be told through the work that teachers and specialists are doing to submerge students in this learning. As a K-12 educational community, the need to create an environment that promotes a global perspective and understanding of a student's place in the world is important in giving students the tools to understand the changing world around them. Sustainable development, societies and the complex global environment are critical notions that students need to understand as citizens of the world and this building and schoolyard helps to successfully facilitate that culture for its learning communities.



Results of Process and Project

Student Enrichment

Trillium Creek opened its doors for the 2012-2013 school year. At the end of the 2011-2012 school year, teachers and administrators were led through a two-day workshop that sought to familiarize them with the concepts central to the design and development of the school. Pedagogical principles were shared so that they could better understand the culture that was intended for the school. Prior to the start of fall term, teachers, administrators and staff worked with the building architects to better understand the intention of the design and important features. Trillium Creek teachers were given planning time before the summer to think about how the features of the school could inform and improve their teaching and classroom planning. The design team and District saw great benefit of giving teachers these opportunities to truly inform the culture of the school that would solidify in the first year of operation with these important design principles and themes. The architects conducted intensive building orientations and site tours to educate teachers and administrators on how to elements in the building could serve as learning tools. An "Amazing Race" type scavenger hunt about the building allowed new building staff self-discovery of all of the building features. Participants in the hunt were given clues at certain points in the building that asked probing questions about how that element in the building could be used to further their student's inquiry.

Seeing the value that these training sessions provided teachers, the District Sustainability Coordinator, a teacher by training, joined architects to work with students to continue to tell the story of the school in the first few months of the start of school. Every student toured the school with this team to learn about the unique and sustainable features and was engaged in various age appropriate activities to reinforce that learning. A leadership group, comprised primarily of third graders, emerged following these initial tours as a cohort interested in describing the building's unique and sustainable features from student perspectives. This group met with architects and the District Sustainability Coordinator in an after school enrichment class to better understand the intricacies of the design and be the docents of the building. The hope is that these docents will train the next year's class to ensure that the critical design and educational elements in the building and site remain in the forefront of the community's thinking.

