



# Dr. Freda Miller School

Calgary Board of Education  
Calgary, AB







*The atrium features a glulam structure to create warmth in the learning commons and social gathering space of the school. This vaulted space also allows natural light to stream into the deepest areas of the floor plan.*

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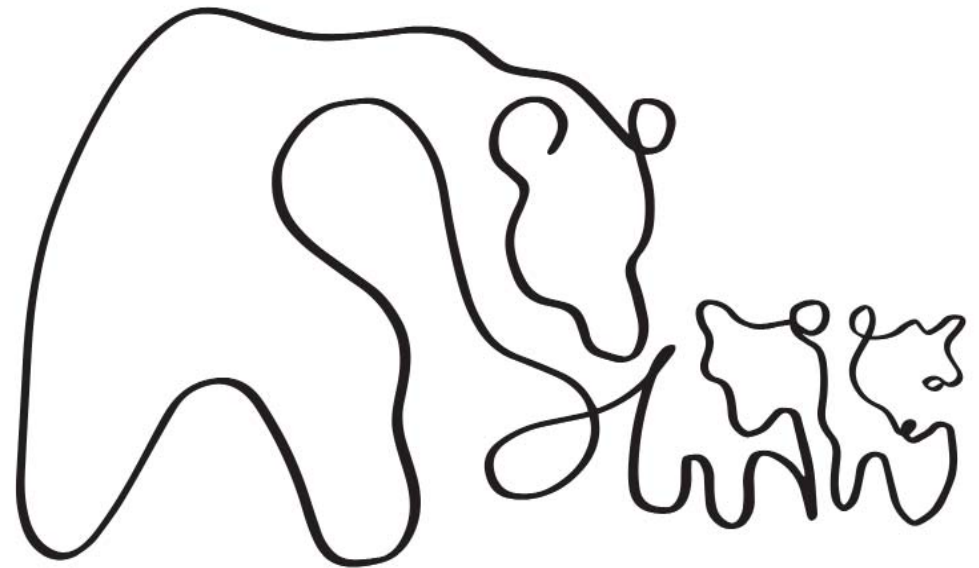
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# Executive Summary

## **LEARNERS FIRST**

The design team prioritized creating a welcoming and accessible space where students can feel a sense of belonging in an environment that fosters creativity and learning. We know that students learn the best when education is about their experience. The team created an environment that emphasizes comfort, scalability of space, noise control and the elements of building design that, for others, go somewhat unnoticed. These details are critical and are reflected in the learning commons which is at the heart of the school and is connected to both a flex space and the arts area. This flexibility enables learning activities to engage with one another and for programs or school projects to easily transition from one area to another depending on the activity—making it easier for teachers and learners to customize the environment for their specific needs.

## **DIVERSITY, EQUITY + INCLUSION**

Along with CBE, the project team presented leading research on neurodiversity in educational spaces and a compelling design that meets and exceeds a vision for a welcoming educational environment for Alberta Education and Alberta Infrastructure. In addition, the design team worked with Indigenous Elders to incorporate culturally significant elements into the interior design. Playful line drawings of a bear and their cubs line the corridor of the learning commons and locally sourced materials, like heavy timber, are featured throughout the space.

## **INNOVATION**

As part of the province's mandate to provide more sustainable and energy-efficient buildings, the school achieved LEED Silver certification and includes a Solar Technology System which provides **21.5% of the electricity needed**. The design team also used locally sourced heavy timber elements to frame the atrium space as well as certified wood products throughout the school. This has the effect of being both sustainable and providing warmth through the use of natural materials.

## **COLLABORATION + CONNECTION**

The architecture team utilized BIM and other collaborative tools early in the design process to create models that could be shared with engineers, trades and other consultants for collaborative input and continuous improvement. This integrated process fostered a positive and efficient working environment through seamless information sharing, participation from all disciplines to solve problems and waste reduction by sharing modelling duties between technologists, engineers and trades. In addition, landscape and civil consultants had a significant influence on the site development.



## RESPECT

CBE and the project team worked with Elders to incorporate elements of their culture and teachings into the design, such as materiality and artwork. The educators at Dr. Freda Miller School have incorporated an Indigenous Holistic Life-Long Learning framework into the wellness program. Students learn emotional regulation and well-being by using the Connecting to Spirit model with a focus on the “Grounding Stone.” These exercises are supported by architecture that connects to the surrounding environment (e.g., Fish Creek Provincial Park, natural materials, daylight) and offers flexibility (e.g., learning commons, smaller breakout areas, adjoining classrooms).

## PLACE MATTERS

The school is situated only one block from Fish Creek Provincial Park and is positioned to have the main entrance and science wing closest to the park to align with the school’s programming. The team worked with the school district to detail the entrance and materials used throughout the school to reflect the neighbourhood context. For example, the pitched roofs and natural wood throughout the atrium allude to the local surroundings in Calgary and the foothills of the Rockies. Blue is the dominant colour throughout the school and is a nod to the endless prairie skies and natural sunlight Calgary is known for as the “Blue Sky City.”

The site was quite small so the team stacked the academic space in a two-storey section of the school while keeping shared programming on the main level (i.e., arts, sciences, library, learning commons). Stacking the academic space allowed an open, large south-facing playfield that was buffered from traffic by the school. In addition, the bus zone is located on the bustling Fish Creek Boulevard while parent drop-off and pick-up is situated on the quieter Everbrook Drive. This setup creates less traffic for the surrounding residential neighbourhood while increasing the efficiency of drop-off and pick-up during peak periods before and after school.



*Above: The gymnasium has exterior access to enable community members and local organizations to utilize the space after hours.*



*Above: The music room’s unique shape is modelled after the ruggedness of the nearby Rocky Mountains—this is further highlighted through the acoustical ceiling panels and carpet design. The room is also positioned with views of the surrounding natural environment and is separated from the classrooms to help with noise disruptions during practice.*



## Scope of Work + Budget

### OWNER

Calgary Board of Education (CBE)

### SITE AREA

174,286 sq. ft.

### BUILDING AREA

37,652 sq. ft.

### GRADES

K-5

### STUDENT CAPACITY

600 students

### OCCUPANCY DATE

August 2020

### CONSTRUCTION COST

\$13.8M

*The library is strategically located beside the learning commons and has movable glass walls that can be expanded or collapsed to accommodate different programming, learning and education needs across the two spaces.*

# School Community Research + Engagement

## CONTEXT

### *The Community*

Dr. Freda Miller School is located in the community of Evergreen, which is nestled in the southwest corner of Calgary, with access to Fish Creek Provincial Park, shopping centres, transit, recreation centres, schools and other amenities. This vibrant and diverse neighbourhood has approximately 23,000 residents, including a significant immigrant population (i.e., 46%) contributing to its cultural tapestry and is expected to grow by 60% over the next 20 years.

### *Interested Parties (i.e., stakeholders)*

Interested parties (i.e., stakeholders) for this project include the Calgary Board of Education Project Team, Elders, Alberta Infrastructure, the City of Calgary, teachers, staff members and administration, students and local community members.

### *Project Challenges*

Since the brownfield site was located within the established residential community of Evergreen and had a lot of constraints it required careful planning to create a safe and effective play space, student drop-off/pick-up and circulation. To reduce the footprint of the building, the design stacks the more traditional classroom in a two-storey block with the creative education spaces (i.e., arts, science) deflecting off of the vaulted learning commons.

A challenge that stemmed from this was constructing a two-storey elementary school without creating barriers for younger kids and issues with movement between the floors. To address this, a separate kinder entrance was provided at grade and then common elements of the program were centralized to move spaces more efficiently. Wider corridors with closer access to washrooms resulted in a safe and compact plan.

### *Available Assets*

As part of the Calgary Board of Education's engagement initiative called "Dialogue," the project team had access to community engagement with students, educators, parents and other interested parties prior to the beginning of the project. This initiative helped actively involve diverse members of the community in the decisions that impact them. The results of this engagement and the related information gathered were made available to the project team during the initial phases to help develop design concepts, programming and spatial needs.

Even though the site is limited in its size for outdoor activities, its proximity to Fish Creek Provincial Park opens up unique outdoor education opportunities for students and educators. This was realized through a design that positions related programming closer to the park for quicker access.

To create a stronger connection with the local context and utilize the material assets in the region, locally sourced materials (e.g., glulam) were sourced and incorporated into the building.

## PROCESS

### *Visioning Process*

We completed a “Discovery Phase” which helped the project team generate a comprehensive understanding of the site and establish the core parameters to guide the design process. This helped our team move beyond mere buzzwords like “21st Century Learning” and gain insights into how the school board envisions the evolution of educational facilities over the next 25 years. With the input gathered, we crafted a Vision Statement that encapsulates the unique and essential aspects of the school. This statement served as a crucial project management tool, ensuring a shared understanding of objectives, approaches and participants. Additionally, as part of this phase, we conducted an environmental scan, considering relevant geographical and topological features as well as factors like sun patterns and wind influences on the site. Preliminary reviews of access routes and infrastructure were also undertaken to inform our planning process.

### *Value to the Community*

The Calgary Board of Education has partnered with the City of Calgary to offer a program called “School Connections YYC” which gives access to available spaces in local schools for community-based organizations that offer programs and services supporting students and families. Dr. Freda Miller School is part of this roster and has become a hub in the community for before- and after-school programming, intramural and recreation opportunities, performing arts, Indigenous cultural education and adult learning. Some of these programs include Seeds of S.P.I.C.E. Early Learning Centre, Evergreen Theatre performances, Calgary Sports Club, Southern Alberta Heritage Language Association and Tipi Teachings from Tsuut’ina Knowledge Keepers.

A key tenet of the design was to have accessible after-hours access to the facility, which is provided through the gymnasium. In addition, the setback and site area has been maximized to enable as many opportunities as possible for outdoor education. Tipi Teachings is one of the more recent examples of utilizing the natural landscape on school grounds. A Tipi was built at the front of the school and students were engaged in meaningful discussions with Tsuut’ina Knowledge Keepers Bruce Starlight Jr. and Joe Starlight to advance the Indigenization of education through a partnership with CBE, Mount Royal University and the Brown Bear Woman Cultural Centre.

The school’s flexible design for different delivery methods has also benefitted post-secondary educational programs at Mount Royal University and the University of Calgary, where future educators have been able to have hands-on experience customizing their teaching environment to match their preferences and those of the students (e.g., common space, smaller breakout areas, team teaching spaces).

### *Engagement that Fostered Diversity, Equity and Inclusion*

Before the start of the project, CBE conducted community engagement with interested parties through their Dialogue initiative which prioritizes inclusivity, transparency, accountability, respect and communication. An ethos of their program is to consider all perspectives, not only the views of the most proponent group or loudest voice. Throughout the phases, the design and consultant team engaged with educators, the CBE project team, Indigenous Elders and other interested parties to gather as many perspectives as possible. In addition, the project team hosted open houses with the broader community to present diagrams, engagement results, material selections and related information to demonstrate how their feedback was incorporated into the final design. The number of community programs based out of Dr. Freda Miller School, the development of Indigenous educational programming with local Knowledge Keepers and Elders and the connections built with local post-secondary institutions demonstrates the transparent, inclusive and equitable community engagement process that happened to bring this school to fruition.





Clockwise from top left:

1. Education students from Mount Royal University are being welcomed to Dr. Freda Miller School in the library for their final teaching practicums (credit: @drfredamillerschoolcbe - Instagram).
2. Material board presented at an open house attended by community members, prospective students/parents and educators from the Calgary Board of Education.
3. Students, teachers and parents from Dr. Freda Miller School, teaching candidates from Mount Royal University as well as CBE teachers and administrators learned Tipi Teachings (credit: Mount Royal University - mtroual.ca).



*The school features an inviting front entrance with accessible ramps, warm glulam and a unique tree sculpture that supports the peak in the design. This "learning tree" is based on local tree species in Fish Creek Provincial Park.*

## Physical Environment

### CONTEXT

#### *Physical Attributes of the Environment*

Dr. Freda Miller School is located near Fish Creek Provincial Park, community amenities as well as public transportation options and an existing bike network (over 800 kilometres of pathways). Before the school was built, it was a brownfield site surrounded by low-density housing and the busy Fish Creek Boulevard that serves as a main thoroughfare for Evergreen residents.

#### *Fits Within the Community*

Since Dr. Freda Miller School is located within a low-density residential suburb, the design is intentionally scaled to the single-family housing context to the west. The larger two-storey section of the school faces north towards Fish Creek Boulevard, which is an arterial road in the community. This helps screen the play space and southern activity zone from the north winds and high traffic that abuts the site. The interior and exterior materiality of the school also matches the natural environment surrounding the school with nods to Fish Creek Provincial Park, the prairies, rolling foothills and the Rocky Mountains.

### RESPONSE

#### *Inspires and Motivates*

Dr. Freda Miller School promotes community gathering, celebrating cultural diversity and respecting unique learning differences. The connection of the building to the land through its shape, materiality and art is a motivating backdrop for the land-based learning approach adopted at the school. The image of the bear seen throughout the learning commons has emerged to symbolize courage, strength, perseverance and empathy towards others as a school ethos.



### *Innovative Aspects*

Even though educational environments are inherently designed with the learner in mind, it's essential to consider these spaces as workplaces. Recent research has shown that the built environment poses risks to educators' wellness if there are poor acoustics, HVAC systems, ergonomics and daylighting, among many other factors. When designing Dr. Freda Miller School, the team ensured that classrooms and teaching spaces had materiality supporting the acoustics so that educators wouldn't strain their voices (for teachers, voice problems are a common occupational hazard). In addition, access to natural daylight and views of the surrounding landscape as well as thermal comfort from triple-glazed windows and an efficient HVAC system creates positive wellness benefits in the workplace.

### *Diversity, Equity and Inclusion*

Since the academic section of this school is two-storey, which is less common for primary education, the site lines throughout the school are intuitive and make it simple to navigate. The school is structured into specific learning blocks (e.g., academic, arts, science, gathering) to also aid in navigation.

The flexible classroom and teaching spaces provide an environment that holistically prioritizes students' experiences so that each pupil can feel a sense of belonging with access to inclusive and engaging spaces that support their unique learning journey and goals (e.g., traditional classrooms, smaller breakout areas, learning commons).

### *Sustainability and Wellness*

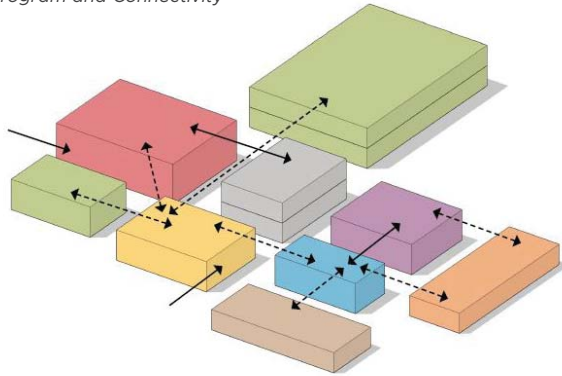
The school has achieved LEED Silver designation through features that support the use of renewable natural resources and create a safe environment for educators and students alike. To conserve water usage, low-flow non-process plumbing fixtures were installed to minimize consumption of potable water during regular building use. In addition, the landscaping was designed to minimize or eliminate the need for potable water irrigation. A PV array was installed on the rooftop, which contributes 21.5% of the energy needed for the building's operations. Lastly, the HVAC system uses low-impact refrigerants, benefitting the air quality in both the built and natural environment.



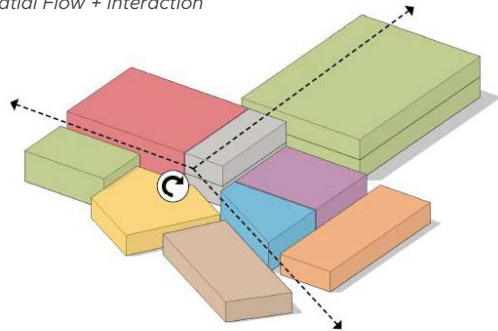
*Above: The top image faces the corner of the brownfield site (looking southeast) from the perspective of Fish Creek Boulevard. The middle image demonstrates how the school fits within the sloping of the site as well as how the one- and two-storey sections of the school connect. The bottom image shows how the two-storey section of the school offers privacy and protection from the elements in the outdoor play spaces (e.g., playground and field).*



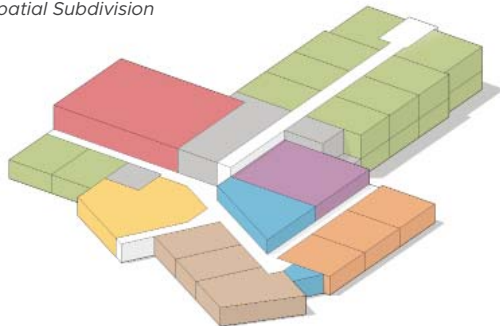
*Program and Connectivity*



*Spatial Flow + Interaction*



*Spatial Subdivision*



## EXHIBITS

### *Design Concepts*

The school programme requirements outlined in the RFP were carefully reviewed and divided into large programmatic groupings and positioned based on site layout and accessibility, desired physical and visual connections, spatial flow and interaction, servicing efficiencies, security requirements as well as construction considerations.

The front portion of the school was partially rotated to better engage the surrounding streets, provide increased visibility of the corridors from the main administration block and provide visual interest from both the building's exterior and interior.

The main administration block is centrally located with direct access to the main entrance vestibule for supervision and security purposes. The gymnasium and ECS classrooms are located adjacent to the administration block and have access to a secondary entrance for parent drop-off and pick-up as well as after-school access. A control point is established along the gymnasium corridor to prevent full after-hour access to the facility.

A central flex space engages the learning commons directly and provides an indirect connection to the administration block, science rooms and ancillary rooms—providing support space for these programme elements in addition to structured and unstructured learning opportunities.

Classrooms are stacked on two levels with the intent of reducing the overall school footprint and corridor lengths in addition to providing construction efficiencies. Classrooms are grouped in pairs with central break-out spaces and team teaching opportunities.

Service spaces, like washrooms and storage areas, are centrally located for easy access from all locations within the school. The main mechanical room and data room are also centrally located for distribution efficiencies. Additional service rooms are located throughout the school based on spatial requirements and the utility servicing connections from the street.

- Flex Space
- Classrooms / ECS
- Learning Commons
- Science
- Ancillary
- Gymnasium
- Administrative
- Service / Mechanical

### *Massing Concept*

The school's massing is inspired by Southern Alberta's geography and the interaction between the prairie landscape, the foothills and the Rocky Mountains.

Core learning spaces are represented by long, unbroken horizontal bands while important programme spaces, including the building's primary entrance locations, the central flex space, the learning commons and the music room are characterized by distinctive "peaks" that emphasize their significance. The gymnasium and mechanical room roof have a gentle slope that is both practical in terms of meeting the height requirements of these spaces as well as consistent with the architectural language of the building.

### *Light + Exterior Connection*

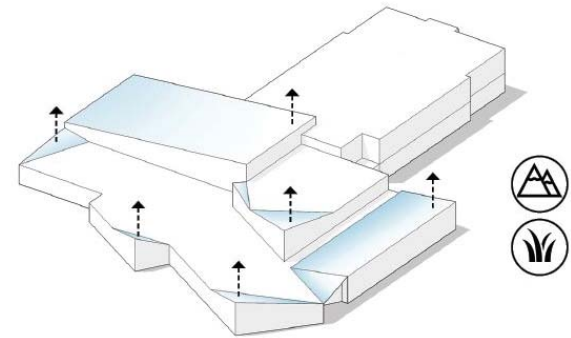
Visible connection to the building's exterior and natural daylighting is achieved through the use of traditional "punched" classroom windows, larger segments of curtain wall glazing in key areas and clerestory glazing that brings light into all of the learning spaces including the centrally located flex space and learning commons.

Classroom windows are arranged in a playful configuration to minimize the institutional feel of the school while still providing natural light and ventilation into these spaces.

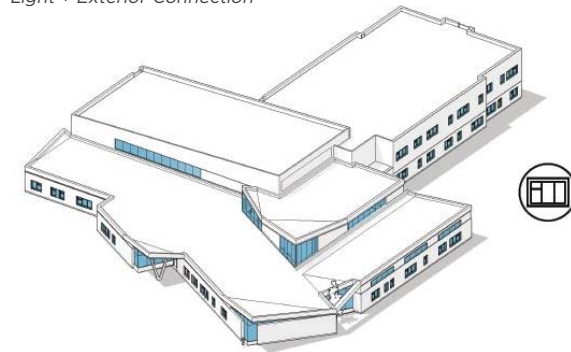
### *Materiality*

The materiality of the school consists of a solid masonry base throughout complimented by metal siding on the upper levels of the school. Walls and soffits clad in a wood-like material provide a separation between the solid walls and the dynamic roof line on the lower and mid-levels of the building. The roof line of these levels are clad in a light metal panel.

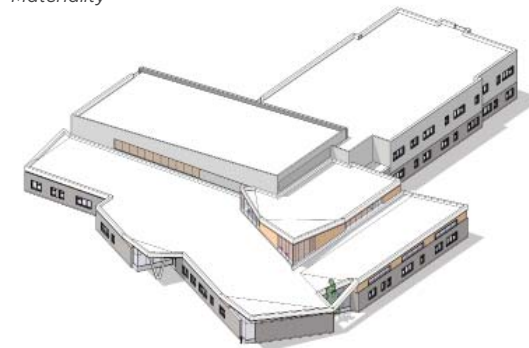
*Massing Concept*



*Light + Exterior Connection*



*Materiality*





*This is a smaller breakout area in the school that can be used for group work, smaller lessons or touchdown meetings between staff and educators.*

## Educational Environment

### CONTEXT

#### *Education Vision for the School*

The vision for Dr. Freda Miller School was to create an environment that fosters creativity and learning through a welcoming atmosphere where everyone can feel a sense of belonging. The building can support this vision by having a multitude of different teaching and learning spaces that can adapt to the changing needs of learners and educators, whether it's a smaller class size, group work, team teaching or neurodiverse learning needs. Another important aspect of the vision for this school was the ability to connect with the land to promote environmental stewardship, health and wellness, outdoor learning/skill building as well as Indigenization of education (i.e., Indigenous land-based learning). This was achieved by incorporating natural elements in the materiality, artwork celebrating local flora and fauna, positioning the school on the site corner closest to Fish Creek Provincial Park and increasing the amount of outdoor play space.



## RESPONSE

### *Environment Supports Curriculum*

A unique aspect of the curriculum at Dr. Freda Miller School is the Connecting to the Spirit Framework (developed by Niitsitapi Learning Centre) that educators use to teach children how to holistically regulate their spiritual, emotional, physical and mental state. This is strengthened through the plethora of unique learning and common spaces that feature natural materials and daylight as well as the proximity to outdoor spaces to learn from and on the land.

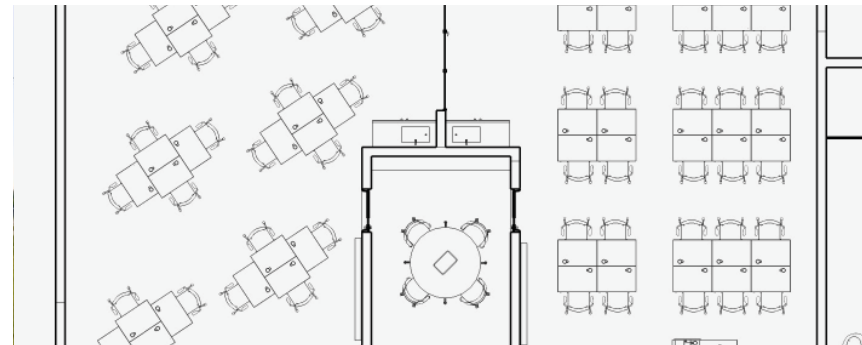
### *Environment Supports Various Learning and Teaching Styles Through Adaptability*

Dr. Freda Miller School's design balances dynamic open learning spaces as well as strong visual connectivity with the more functional and traditional teaching space configuration. This strategic balance helps create a multi-use, flexible and ultimately adaptable architecture that will influence the evolution of learning over the coming decades.

Having an adaptable educational environment has allowed educators at Dr. Freda Miller School to customize how they use the space to suit their needs and their students. With the option of smaller breakout spaces, team teaching classrooms, flexible common areas and dedicated STEAM labs, educators can easily tailor the physical environment to their lessons. A flexible space also helps learners develop their independence by personalizing their education to support their unique needs.

### *Innovative Aspects of Educational Environment*

The design team treated every square foot of the school as having the potential for learning spaces and designed the corridors as third spaces to accommodate group work, independent work time, socializing and other essential aspects of a learner's experience in primary school. The building is also future-proofed to adapt to changing technologies in the classroom.



Above: The top and middle images illustrate a team teaching space model and floor plan developed during the design phases. The bottom photo showcases a team teaching space at Dr. Freda Miller School with the middle divider opened.

# Results

## **EDUCATIONAL GOALS + OBJECTIVES**

By creating an open, warm and welcoming environment for students, educators and visitors, Dr. Freda Miller School has become a hub for the community and a safe space for students to access the tools they need to learn. Educators have utilized the school's flexible environment and its proximity to Fish Creek Provincial Park to incorporate a stronger connection to the surrounding land in their lessons.

## **SCHOOL DISTRICT GOALS**

As mentioned previously, CBE identified having an adaptable school that could respond to future technological, curriculum, environmental and learner needs. Between the flexible teaching spaces to accommodate different delivery models, sustainable building features and easy access to mechanical and electrical systems, this school will be able to adapt to the changing educational and physical environment. In addition, the design team was able to incorporate artwork and materials that reflect the local environment and wildlife which was a goal identified during Indigenous engagement.

## **COMMUNITY GOALS**

The school fulfills a need in the community to provide a facility for after-hours programming (e.g., recreation, arts, learning) and provides families with young children in Evergreen a school within walkable or transit-accessible distance from their homes. As of 2023, the school is at 80% capacity, demonstrating the demand in this community for K-4 educational programs and the ability of the school to accommodate more students as families move into Evergreen.

## **UNITENDED RESULTS + ACHEIVEMENTS OF THE PROCESS / PROJECT**

The school opened during COVID-19 and the flexible environment enabled teachers to adapt to the changing rules to create a safe and accessible space for everyone.

## **VALUE + GOOD STEWARDSHIP OF FINANCIAL RESOURCES**

Having transparent and open communication between the design team, consultants and trades fostered a collaborative working environment. This was valuable for the project as issues were resolved in a quick time frame during working drawings, resulting in very few change orders. In addition, the school design was repeated on two separate schools enabling the budget to stretch further.

## **SUSTAINABILITY + WELLNESS OUTCOMES**

The building achieved LEED Silver designation by having an energy-efficient design that can respond to the changing climate conditions in the years to come. Some of the sustainable features include water conservation technologies, PV arrays and an energy-efficient HVAC system with low-impact refrigerants to offset any impacts on the natural environment. The school's design also supports the Indigenous Holistic Life-Long Learning framework that teaches students strategies for emotional regulation.





*The library is next to the learning commons and has flexible glass walls so that educators can combine the two spaces to adapt to their lessons. The playful bear motif is etched on the glass walls surrounding the library.*