



2022 Canadian Green Building Awards  
**Clayton Community Centre**

# PART 1 PROJECT DESCRIPTION

Use for all categories. Projects are judged based on criteria of sustainable design, architectural merit and innovation.

2022

CANADIAN  
GREEN  
BUILDING  
AWARDS

THE NATIONAL PROGRAM OF  
SUSTAINABLE ARCHITECTURE  
& BUILDING MAGAZINE

SABMag

## Project categories

Identify which Award category you are entering

☐

### 1. Residential [small]

Open to new or renovated buildings less than 600m<sup>2</sup> in area, of which a minimum of 75% is dedicated to single-family or multi-family residential uses.

☐

### 2. Residential [large]

Open to new or renovated buildings [typically multi-unit buildings or groups of related buildings] greater than 600m<sup>2</sup> in area, of which at least 75% is dedicated to residential uses.

☐

### 3. Commercial/Industrial [small]

Open to new or renovated buildings up to 2,000m<sup>2</sup> in area, of which more than 75% is dedicated to commercial or industrial uses.

☐

### 4. Commercial/Industrial [large]

Open to new or renovated buildings [or groups of related buildings] greater than 2,000m<sup>2</sup> in area, of which at least 75% of the floor area is dedicated to commercial or industrial uses.

☐

### 5. Institutional [small]

Open to new or renovated buildings up to 2,000m<sup>2</sup> in area, of which more than 75% is dedicated to institutional uses.

☒

### 6. Institutional [large]

Open to new or renovated buildings [or groups of buildings] greater than 2,000m<sup>2</sup> in area, of which at least 75% of the floor area is dedicated to institutional uses.

☐

### 7. Mixed Use

Open to new or renovated buildings [or groups of related buildings] of any size, in which no individual use exceeds 75% of the overall floor area.

☐

### 8. Existing Building Upgrade

Open to buildings of any size or type in which the primary focus of the work has been to enhance the performance or extend the life of an existing structure. Entries in this category are required to respond only to the submission criteria appropriate to the project.

☐

### 9. Interior Design

Open to interior design projects of any size or type. Entries in this category are required to respond only to the submission criteria appropriate to the project.

**An award will be given in each category at the discretion of the jury.**

## PROJECT DETAILS

Project name: Clayton Community Centre

Address: 7155 187A St, Surrey, BC V4N 6L9

Year completed: June 2020

## PROGRAM AND CONTEXT

**Project type:** [Identify all uses occupying 10% or more of gross floor area]

Multipurpose spaces, Community kitchen , Woodworking shop, Preschool and childcare, Gymnasium and change rooms, Fitness and spin studios

Shared social space, Library, Computer learning classroom, Silent study room, Visual arts studios, Rehearsal hall and music studios

**Project site:** [Check all that apply]

☒

Previously undeveloped land

☐

Urban

☐

Rural

☐

Previously developed land

☒

Suburban

**Other Building description:** [Check only one]

☒

New

☐

Renovation

☐

Both [If both, list \_\_\_% new and \_\_\_% renovation]

**STATISTICS\*** Provide the following metrics as applicable to your project.

• Site Area: 25,095 m<sup>2</sup>

• Building gross floor area: 7,060 m<sup>2</sup>

• Energy Intensity: 73 KWhr/m<sup>2</sup>/year [Include both base building and process energy]

[optional: report energy intensity separately as follows:

• Energy Intensity, base building: \_\_\_\_\_ KWhr/m<sup>2</sup>/year

• Energy Intensity, process energy: \_\_\_\_\_ KWhr/m<sup>2</sup>/year

• Reduction in energy intensity: 72 %.

• State the reference standard on which the % reduction is based: MNECB, NECB or ASHRAE 90.1

[include version]: ASHRAE 90.1-2010

• Recycled materials content: n/a % by value

• Water consumption from municipal source: n/a litres/occupant/year

[Include both base building and process consumption]

• Reduction in water consumption: 20 %

• State the reference on which the % reduction is based: LEED ☒ or other ☐

• Construction materials diverted from landfill: n/a %

• Regional materials by value: n/a %

**\*NOTE FOR PART 9 RESIDENTIAL PROJECTS: PROVIDE THE STATISTICS ABOVE IF AVAILABLE.** Include in the Executive Summary [see next page] the EnerGuide or the Home Energy Rating System [HERS] ratings if available, and the WalkScore rating [see www.walkscore.com]. Also, a qualitative assessment of project performance should be included in the appropriate sections of the narrative.





SOUTH ELEVATION





FEATURE STAIR



MAIN ENTRANCE

## Project summary Clayton Community Centre

Clayton Community Centre represents the next evolution of community building design. The facility combines four aspects of the City of Surrey's services — recreation, library, arts and parks — within a single integrated facility to become the social heart of the growing Clayton Heights neighbourhood.

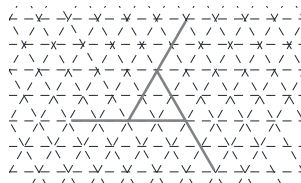
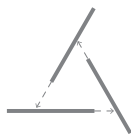
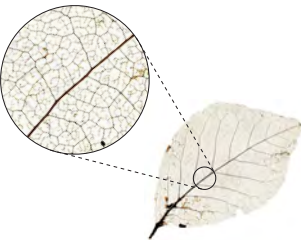
The project's compact form benefits both the building program and performance target by minimizing the surface area of the floor, walls, and roof relative to the volume of the building to be heated and cooled.

Major siting and programmatic decisions were also driven by performance. Building orientation optimizes passive heating and cooling strategies, and program elements are arranged within the building to best benefit from the solar path and exposure throughout the year. The building's leaf-like heavy timber structure is a series of large-scale modular interlocking pinwheel units that create a two-way structure enveloping the building under one singular system, metaphorically and physically drawing strength from the interconnected components.

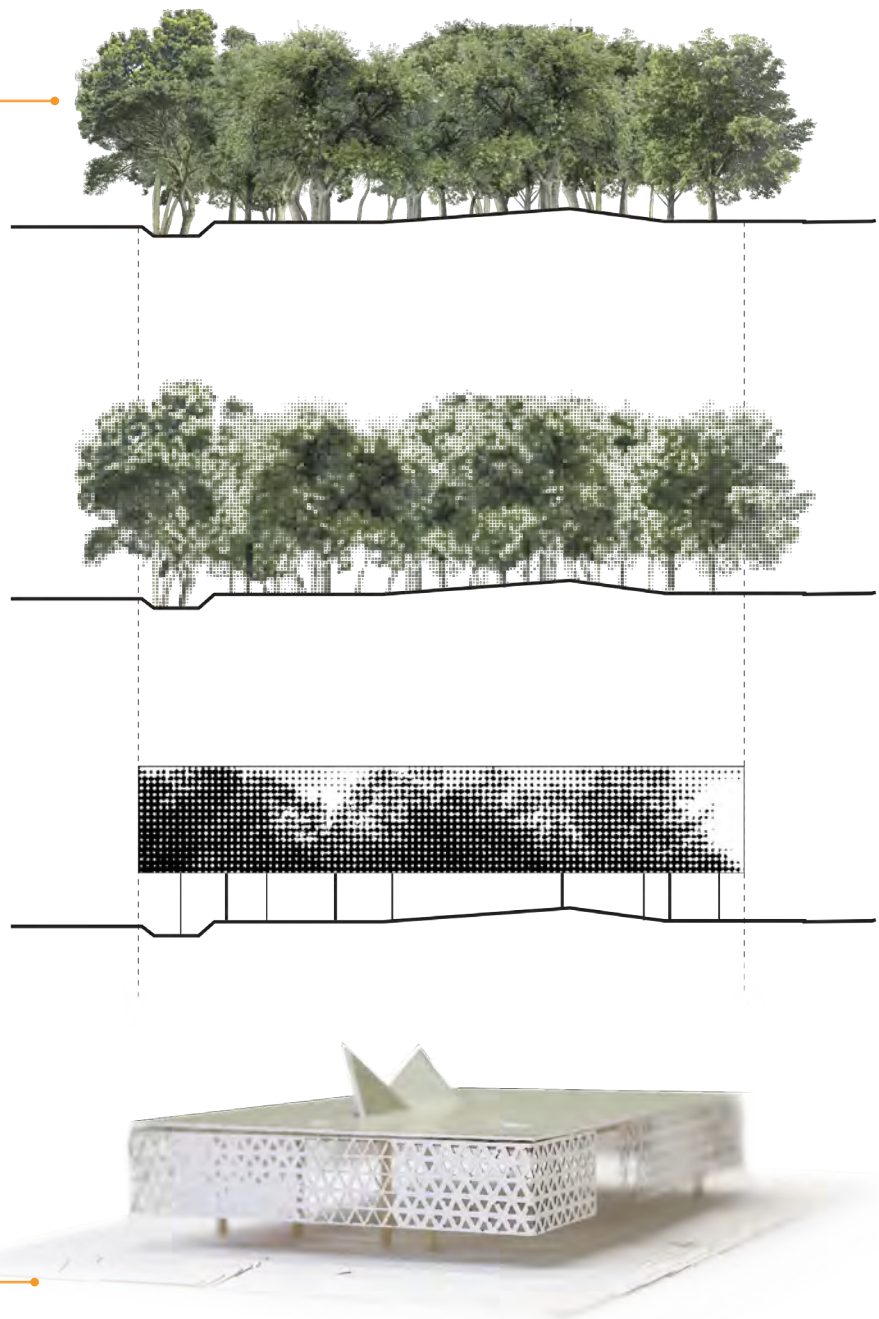
Clayton Community Centre is the first community centre to earn Passive House certification in North America and is currently Canada's largest Passive House facility.



A forest's canopy is made up of branches and leaves that create intrigue and clearings through dappling of light.



The interlocking members of its pinwheel components metaphorically and structurally gain its strength by all components being interconnected.

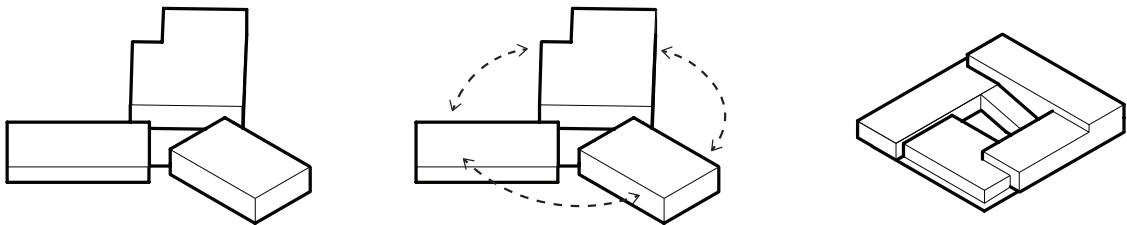


## Clayton Community Centre

### 1. Strategic decisions

The building is situated as an extension of the treasured forest on the site and the parti draws on the qualities of this natural setting. Like a forest ecosystem is defined by the inhabitants that coexist in symbiosis to create a unique ecology, the roof and building envelope of this new civic hub, mimics the tree canopy to unify the four traditionally separate civic services of arts, library, recreation, and outdoor park underneath one canopy.

The orientation and location of program elements are arranged to benefit from the solar path and natural ventilation through the site. The compact building reduces the length of thermal bridges, a critical element for an energy efficient envelope. Large pop-up clerestory windows allow natural light in to offset the need for electrical lighting. Automated triple-glazed windows and façade clerestories naturally ventilate the building and eliminate the need for cooling except in extreme conditions. Low speed, high volume ceiling fans maintain a comfortable breeze in highest occupancy spaces. Custom radiant ceiling panels integrated into the structure provide heating and cooling as required. Underfloor air distribution provides premium displacement ventilation in the library space.



### 2. Community

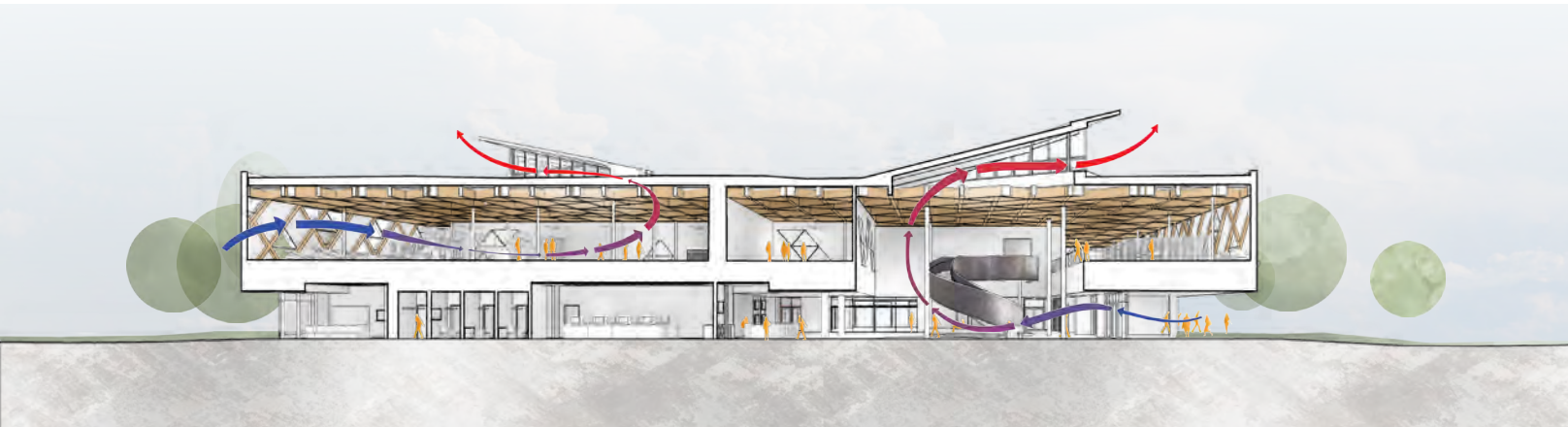
Clayton Community Centre is situated to better meet the needs of a growing community. Designed to be welcoming of youth from the two adjacent secondary schools, and to provide key public gathering spaces that encourage community connections among culturally diverse residents, essential community services now serve a neighbourhood where there were none before, eliminating longer trips by car to access libraries, arts and fitness opportunities. In addition, the restoration of riparian areas and landscape plan improved and enlarged the multi-use pathway along 72nd Ave, further encouraging access by walking and cycling, and connecting to the regional network.

### 3. Site ecology

The building is located to preserve the existing forest and improve the function of the riparian zone adjacent to the site. An existing asphalt parking lot was removed and replaced with a naturalized detention pond, rain gardens were installed to manage and treat run off, protecting and improving water quality on and off site. In addition, the existing turf grass and invasive species within 15m of the riparian area, were removed and restored with native plant communities, greatly improving the condition of the riparian habitat.



## Clayton Community Centre



NATURAL VENTILATION DIAGRAM

### 4. Light and air

Natural ventilation via automated windows in the façade and clerestories allows heat generated by people, lighting, and appliances to escape, and delivers fresh and cool air. This strategy reduces the cooling loads by 62%.

Several strategies were implemented to reduce lighting loads, including daylighting through large openings and clerestories, and daylight and occupancy sensors to prioritize daylight, and control electric lighting.

### 5. Wellness

Conceived to support a broad definition and range of wellness needs for a young and growing community, Clayton's unique mix of spaces combines arts and culture programming, recreational activities and a branch library. These services are supported by many shared social spaces: a community kitchen and garden, a tool sharing centre, community workshop, a café, and child-minding, preschool, and childcare spaces.

A key design driver was universal access and inclusive design to better meet the wellness needs of all. Research for this project led to the publication of Designing for Inclusivity, our guide to universal washroom and change rooms. Shared over 20,000 times, the document has been used locally and nationally by designers, institutions, and governments. The building is currently being added to [accessibuild.ca](https://accessibuild.ca), an indoor navigation app for buildings, to empower all visitors, including the visually impaired, to navigate the indoor environment.



FITNESS ROOM AT NORTH FACADE



LIBRARY AT SOUTH FACADE



Clayton Community Centre

6. Water conservation

Indoor water use is reduced by 20% through specification of low flow fixtures. Outdoor water use savings is 50% achieved through native and adaptive species and efficient irrigation systems (LEED calculation).

7. Operating energy present and future

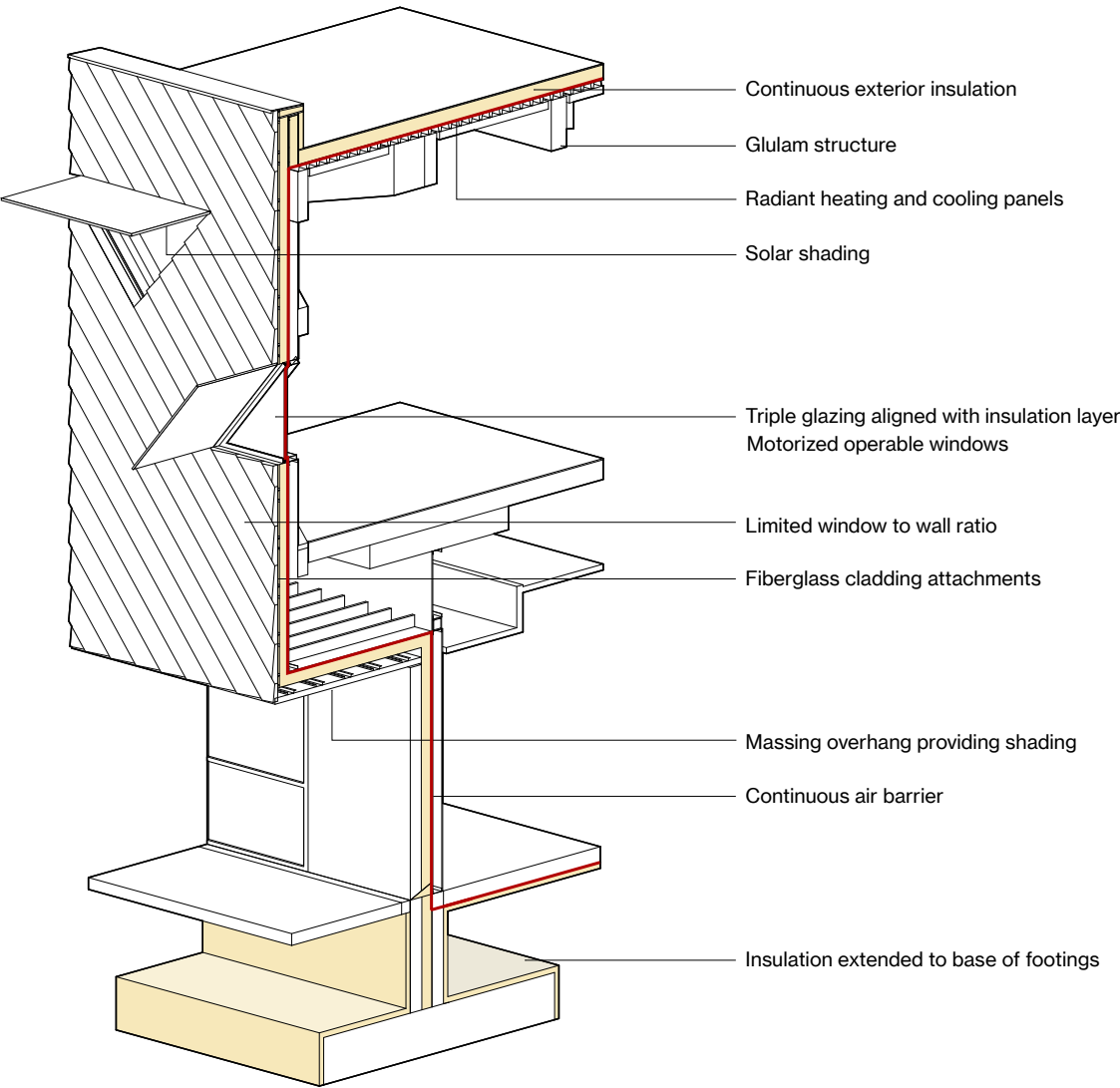
Active systems are designed in service of strong passive strategies including an efficient, airtight, and thermal bridge-free envelope. In addition, orientation and location of program elements within the building were arranged to benefit from the solar path and natural ventilation through the site. Cooling load in the fitness room was reduced 64% compared to typical practice by strategically locating it on the north façade to limit the solar heat gain and provide natural ventilation. Low speed, high volume fans also help to maintain comfort.

Natural ventilation via automated windows in the façade and clerestoreys contributed most significantly to the reduced demand for cooling allowing heat generated by people, lighting, and appliances to escape while delivering fresh and cool air. This strategy reduced the cooling loads by 62% throughout the building. In the summer, the building is flushed at night with cool outside air to manage the thermal mass. Radiant ceiling panels provide heating and cooling as needed and six Passive House certified heat recovery ventilators were installed throughout at strategic locations to minimize ducting and maximize efficiency. The electrical system and roof have been designed to accommodate a future PV system with capacity to generate all required energy on-site.

The building energy intensity is 73 KWhr/m2/yr, a reduction of 72% compared to the ASHRAE 90.2010 baseline, and has a GHGI of 0.73 kg/m2/yr, a 98% operational carbon savings compared to the baseline building with gas heating.



SHADING ON FACADE



WALL SECTION



SOUTHWEST





MASS TIMBER STRUCTURE AT THE CEILING

## Clayton Community Centre

### 8. Materials and resources

Materials were selected according to best practice for transparency and health. The palette was limited to reduce the impact of materials overall. The mass timber structure exposed at the ceiling balances the space with a biophilic quality that contributes several co-benefits including regionally sourced wood and reduced embodied carbon.

### 9. Building life cycle considerations

Clayton is designed to evolve with the community for generations to come. Spaces can expand and occupy adjacent areas; indoors, outdoors, and into the central social space. This, combined with no hard barriers between art, recreation, and library areas, creates the diversity of spaces required for successful mixed-use programming over the long term. Collection shelving in the library can be formed into different configurations to allow for community gatherings, special events, and adaptation for future use.

A whole building LCA has not been conducted, however the structural system is estimated to reduce embodied carbon emissions by at least 10% compared to an all-steel structure.

### 10. Education and information sharing

- Lessons and project case studies have been widely shared with the design industry in many speaking engagements and publications.
- Building tours conducted regularly
- QR codes throughout the space to learn more about the design
- Fact sheets and FAQs provided to staff
- Two videos produced by Passive House Canada, BC Hydro and the Province of BC to document design strategies and outcomes of this first of its kind project; View them here:  
<https://www.youtube.com/watch?v=grIGlhcDO1c>  
<https://www.youtube.com/watch?v=awUGCPreA58>
- Post-occupancy evaluation planning is currently in progress to capture both qualitative and quantitative performance feedback from the building in operation.



- library
- arts
- recreation

UPPER LEVEL LEGEND

- Library
- Silent Study
- Meeting Room
- Workroom
- Computer Learning Classroom
- Fitness Studio
- Fitness Centre
- Spin Studio

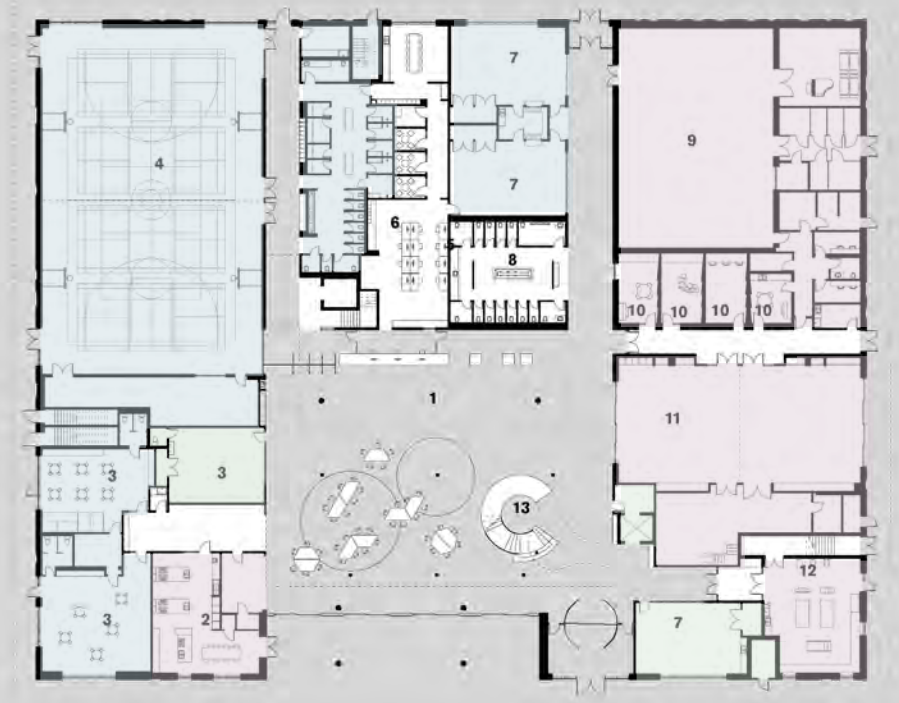


UPPER LEVEL PLAN



GROUND LEVEL LEGEND

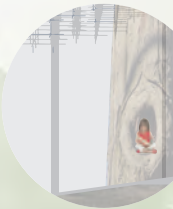
- Lobby/Shared Social Space
- Community Kitchen
- Pre-School Spaces
- Gymnasium
- Universal Change Rooms
- Administration Offices
- Multipurpose Rooms
- Universal Washrooms
- Performance Hall
- Music Studios
- Visual Arts
- Workshop
- Feature Stair "Fort & Bonfire"



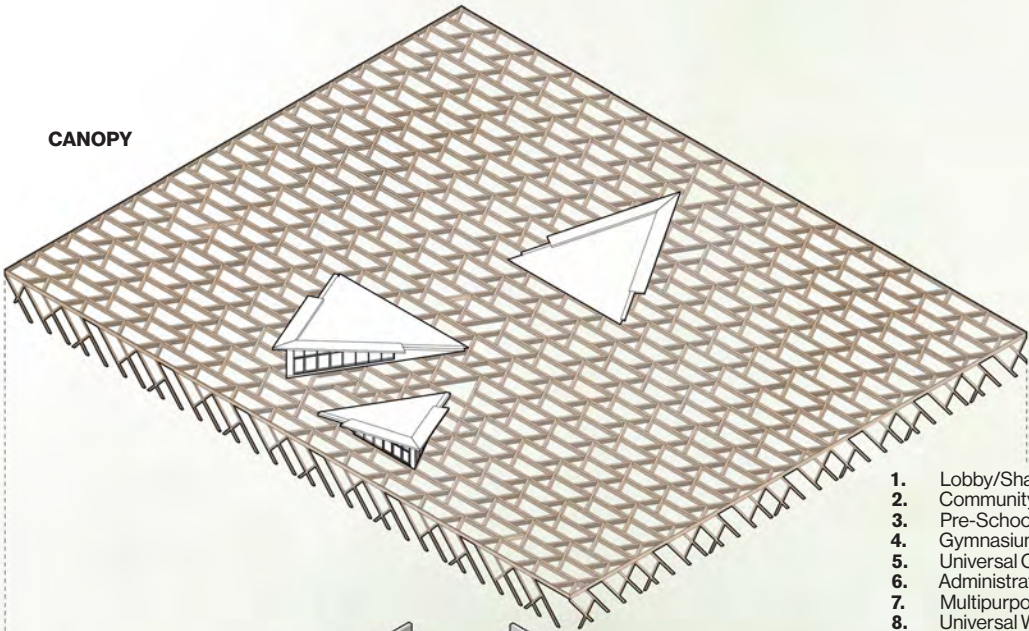
GROUND LEVEL PLAN



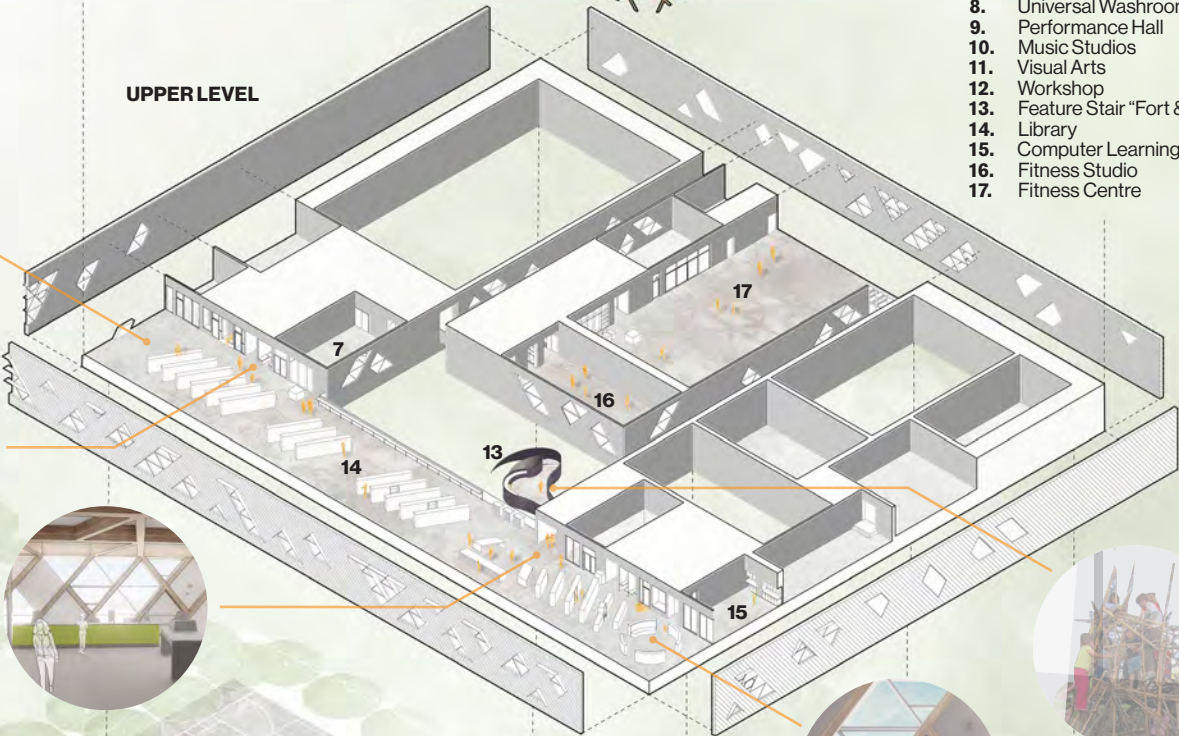
Beneath the canopy is a space that strives to be responsive and evolving both physically and with its activities—a space for unexpected discovery and learning, and a leader in social inclusivity and environmental sustainability. The project offers fully universal washrooms and change rooms, and is targeting Passive House Certification to create a space that redefines a civic centre to serve its diverse and rapidly changing demographic context.



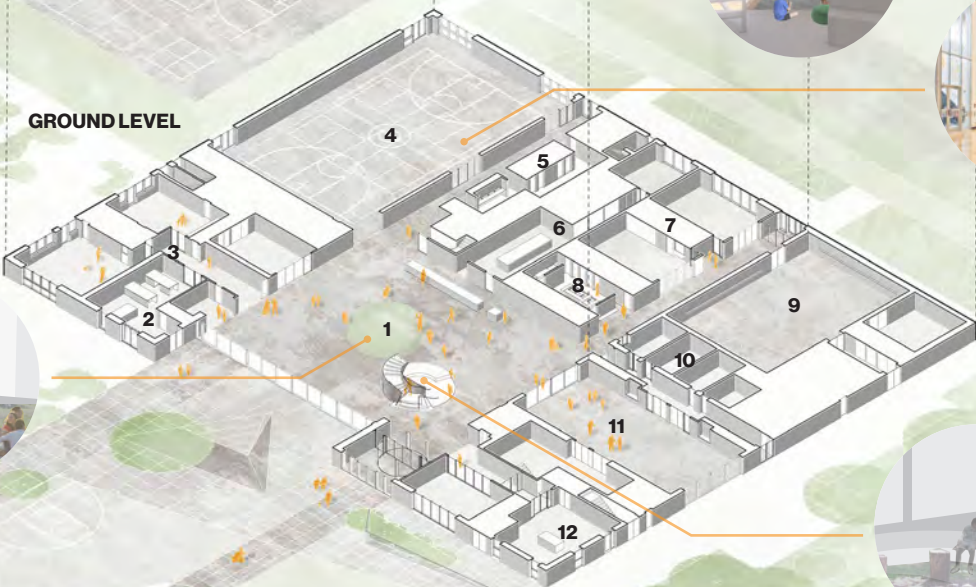
CANOPY



UPPER LEVEL



GROUND LEVEL



- Lobby/Shared Social Space
- Community Kitchen
- Pre-School Spaces
- Gymnasium
- Universal Change Rooms
- Administration Offices
- Multipurpose Rooms
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- Feature Stair "Fort & Bonfire"
- Library
- Computer Learning Classroom
- Fitness Studio
- Fitness Centre







VIEW FROM ABOVE FEATURE STAIR 'FORT AND BONFIRE'



SKYLIT CORRIDOR TO UNIVERSAL CHANGE ROOMS



MAIN ENTRANCE









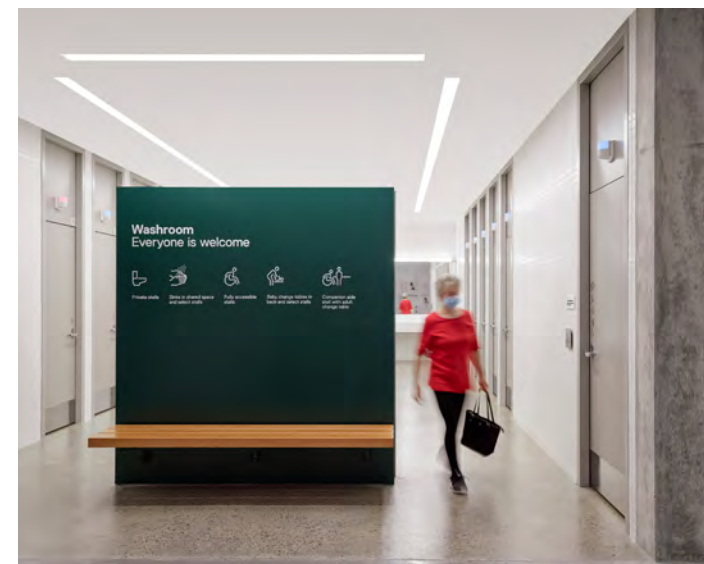
SOUTHWEST



GYMNASIUM



CHILD CARE SPACE



UNIVERSAL WASHROOMS



COMMUNITY KITCHEN



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Cover Page



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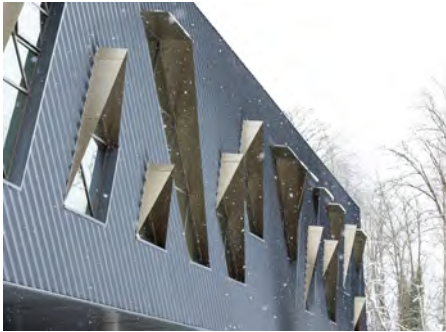
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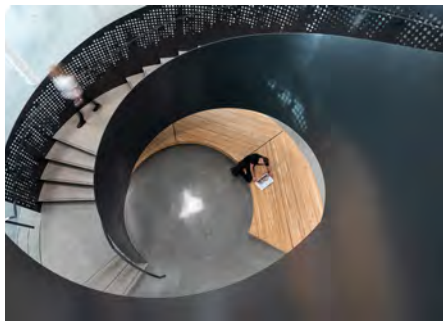
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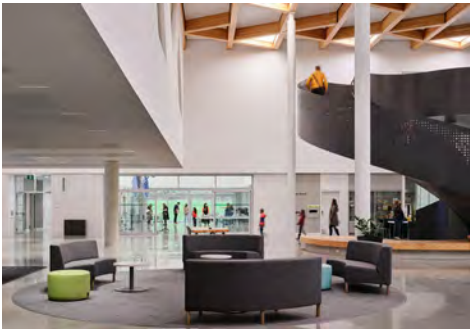
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