The historic Milner House at the heart of the new childcare facility Building Blocks on Balmoral at Great-West Life is an exemplary case-study highlighting the success of adaptive re-use of heritage buildings. Once vacant and derelict, the Milner House now sits at the heart of a much-needed facility which provides 100 licensed childcare spots to Great-West Life employees and the West Broadway community.

In addition to the extraordinary measures that Great-West Life undertook to rehabilitate the grade III heritage building, there is another equally impressive story. Not only has this endeavour restored the Milner House to again have a useful life, it has transformed the building to be among the leaders of sustainable, energy conserving and healthy buildings in Canada. The new facility has achieved LEED Platinum certification with an array of sustainable features that include: geothermal ground source heat-pump with in-floor radiant heating and chilled beams for cooling; displacement ventilation translating to lower fan power; significant use of salvaged, refurbished and re-used materials; substantial water use reduction; an abundance of daylight and views; and use of low-emitting materials.

By transforming a century-old building into a leading contemporary example of sustainability, the Building Blocks on Balmoral at Great-West Life will stand as a testament to adaptive re-use well into the next century.

Building Blocks on Balmoral at Great-West Life

Quick Facts

LOCATION: 51 Balmoral Street, Winnipeg
AREA: 1,155 sqm (12,432 sf)
STATUS: Completed May 2017
Strategic Decisions

The childcare facility has a strategic focus on creating an inclusive environment. In order to create a sense of “home” for children, the 100-capacity facility was deliberately divided into two smaller additions on either side of the existing Milner House: one for toddlers and infants and one for preschool aged children. Each addition has direct connection to accessible exterior play yards, designed with naturalized landscapes and an age-appropriate focus.

Additionally, the existing heritage structure required a new foundation. In order to do this, the house had to be stabilized and stripped of its interior finishes and exterior masonry veneer, which was entirely supported by the failing foundation. Once this was complete, the house was cut from its existing foundation, lifted and moved along steel beams to allow for a new foundation to be constructed before it was put back onto its new foundation. In order to keep the entire main floor on one level without introducing ramps and stairs, the original structure was strategically lowered approximately 610mm (2') onto a new foundation, and the north end of the site was built up over 1220mm (4') to provide an accessible play yard for the children.
Strategic Decisions

The historic Milner House, stripped of its masonry cladding, being moved along steel beams to allow for the new foundation to be constructed.
The surrounding character of the West Broadway Community: houses across the street from the childcare facility.
Community

The adaptive re-use of the Milner House has had significant impact within its community, breathing new life into a structure that was previously vacant for 20 years, but now contributes significantly to the economic and social vitality of Winnipeg’s West Broadway Neighbourhood. Through this project, Great-West Life has fostered and maintained a positive relationship with its neighbours; creating a much-needed childcare facility that is accessible to the local community; and respecting the existing heritage context of the building and the neighbourhood through a design that draws from the scale, rhythm and proportion of its residential context.
Aerial overview of the site prior to remediation of the heritage foundation, with the former laneway visible to the north of the Milner House.

Landscape / planting plan.

Site Ecology & Water Conservation
As a significant source of sediment and contaminants, any increased stormwater runoff related to the development would have a detrimental effect on the nearby Assiniboine River. As a result, the management of stormwater was a critical consideration early in the design process. The strategic decision to create a universally accessible main level and lower the building on the site, created the opportunity for two key site planning moves that served to facilitate on-site stormwater management: the elimination of an impervious lane connecting Balmoral Street to the Great-West Life parking lot; and the creation of a built-up play yard at the north end of the site, which created a retention area for stormwater run-off. The site was enhanced from a pre-development discharge quantity of 115.1 m³ to a post-development discharge quantity of 105.3 m³ per a 2-year, 24-hour design storm.

As a regional priority for the prairies, water conservation was of paramount concern and the project maximizes water efficiency with the use of low flow fixtures and aerated faucets, with over a 50% reduction in potable water use. The fixtures alone contribute to exemplary water savings.

There is no permanent irrigation equipment needed for the facility’s green spaces, as landscape design includes native, drought-tolerant species that will not require irrigation once established.

Site Ecology & Water Conservation

Water Use Reduction

Design Baseline 642, 339 L / Yr
Facility (Projected) 320,537 L / Yr
East facing childcare space filled with daylight from the large and high windows and corner feature window.
As a sustainable facility, which is first and foremost focused on health, indoor environmental quality is a priority. The facility has been designed with 100% fresh air ventilation and each childcare room has displacement ventilation, which introduces fresh air at a lower temperature than the ambient room air, at a low velocity. By supplying the fresh air closer to the breathing zone, a stratified flow is created based on natural air movement where air is driven by a difference in density and natural convective flows. The system was selected not only because of the significant energy savings it offered, but also because it was the healthiest and most effective way to deliver fresh air to a lower breathing zone that small children and crawling infants would occupy.

Additionally, the facility was designed so that 97% of regularly occupied spaces have views to the outdoors and that all regularly occupied spaces receive natural light, including the existing 100-year-old home. The design of the additions maximize daylight penetration into the childcare rooms with large clerestory windows within each gable of the ‘houses’ roof. Window placement was not only strategic to address daylighting, but also to provide appropriate views for both adults and children. Reading and play space corner nooks were designed within each room with lowered sill heights to facilitate a child’s view outside: to witness the ever-popular garbage and recycling pick-up; to be at eye level with the butterflies and insects attracted to the native plantings; or simply to watch the goings on of the local community.
Wellness

Throughout the design process, it was recognized that wellness does not just apply to physical health, it also incorporates the social, emotional, environmental, occupational and intellectual well-being of occupants, which in this case, largely comprises young children. A priority was placed on creating both direct and indirect connection to the outdoors: through daylit social spaces for staff with a view to the elm tree canopy; the creation of corner window nooks in each child care room that feature learning opportunities in viewing daily activities ranging from garbage and recycling pick-up to mail delivery; the re-use of salvaged wood as furniture from a mature tree that was required to be cut down for the construction; and the provision of a variety of outdoor spaces.

Recognizing that a child’s wellness is dependant upon being able to spend time outside, the project offers a variety of outdoor spaces ranging from the naturalized exterior play yards to the porch of the heritage house, which provides a weather-protected outdoor learning environment.
Daylit staff lounge space for staff with view to the elm tree canopy on Balmoral Street
Annual Energy Savings
kWh/m²

56%

Annual Energy Use kWh/m²

Design Baseline
334

MB Daycare Averages (Based on 6 2017/2018 Projects)
287.5

Cdn National Median for Child Care
230.6

Building Blocks on Balmoral (Projected)
145.5

Typical Childcare Room HVAC Systems

- Supply Air
- Glycol Supply
- Main Supply
- Glycol Supply and Return
- Return Air
- Corridor Plenum
- Corridor
- Floor Heating Manifold
- Child Care Room
- Infloor Geothermal Heat
Elements of the building design were selected to maximize occupant comfort and minimize energy consumption. The HVAC system contributes a total energy savings of 56% compared to the baseline building designed with the Model National Energy Code for Building's standards, with most of the savings found in space heating and interior lighting. The energy conservation design features include:

- Ground Source Heat Pump System
- Passive chilled beam and radiant floor system
- Exhaust air heat recovery (air to air)
- Triple glazed fibreglass windows
- Reduced lighting power densities
- Interior lighting controls
- Low flow service hot water fixtures
- High efficiency service water heating system

### Energy Use Breakdown (MJ / Year)

|Category         | Design Baseline | Building Blocks on Balmoral (Projected) | Savings
|------------------|-----------------|----------------------------------------|--------
|Lighting          | 151,873         | 66,650                                 | 44%    |
|Heating           | 897,426         | 255,118                                | 72%    |
|Fans              | 96,293          | 44,554                                 | 54%    |
|Exterior Lighting | 13,360          | 2,239                                  | 83%    |
|Water Heating     | 42,066          | 10,480                                 | 75%    |
This project diverted nearly 90% of construction waste from the landfill for reuse, recycle, or repurposing. Over 14% of new materials, including rebar, concrete, and millwork, contain recycled content and over 36% of new building materials used were regionally sourced. Of this material, 19% was comprised of re-used brick, tyndall stone, harwood floors, windows, fencing and architectural woodwork.

Additionally, over 75% of the original structural walls, floors and roof of the existing house have been maintained, including reuse of several materials within. Retaining the original building materials reduced the environmental impacts of extracting, manufacturing, transporting, and incorporating new materials into the project.
Main level Living Room, where efforts were made to salvage and restore original woodwork, hardwood flooring and original windows.
Building Life-Cycle Considerations
Building Life-Cycle Considerations

Building Blocks on Balmoral at Great-West Life has breathed new life into a 110-year old heritage structure and through adaptive re-use, created a new facility with an additional minimum 50-year lifespan. Not only was the facility designed as a durable building, it was also designed to be resilient with future-proofing energy-saving measures. All of the south facing roofs of the new additions are structured to accommodate the future addition of solar photo voltaic panels. The capacity of panels, for which an allowance has been made, will create 10 kW of renewable solar energy, which will offset the electricity in the facility at some point in the future.
Education & Information Sharing

In order to undertake renovations on the historic Milner House, a detailed inventory of heritage items was necessary to receive approval from the City of Winnipeg’s Historical Buildings and Resources Committee.

Historic photographs, as well as those depicting the construction process, line the central corridor, living room and office for all to see and appreciate.

Building Blocks on Balmoral at Great-West Life is committed to communicating the importance of sustainable building and sharing the lessons it has learned with parents, staff, children, and members of the community. Tours of the facility are offered for parents and include sustainability information as well as a self-guided brochure as part of the environmental education program.

Photos on the wall in many rooms and the corridors show the original heritage spaces.

One side of the sustainability focused tour brochure designed for client or user groups to provide educational tours.
Education & Information Sharing