thanks to:

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City of Vancouver Archives
Thompson Berwick Pratt fonds, UBC Archives
James Johnstone, Home History Research, homehistoryresearch.com

14 THEMES. 4 CASE STUDIES.
heritage + sustainability

Friedman Building
modernist architecture and sustainability

1636 Charles St
making space for heritage

1220 Homer St
adapting Vancouver’s industrial heritage

662 + 666 Union St
evolving heritage design

passive strategies
smart material selection
daylighting
efficient energy systems
urban densification
creative recycling
rethinking spaces
prioritizing community
sensitive adaptation
balancing high performance + character
retrofitting historic architecture
green building rating systems
adaptive reuse
economic feasibility
Heritage conservation for the 21st century will focus on the sustained use of older buildings rather than protecting them from change. While some special buildings should be conserved to remind us of where we come from, we cannot live in a museum. Smart sustainable preservation is about evolving our existing building stock, instead of razing and building new.

The purpose of this document is twofold: firstly, it exposes four inspirational rehabilitation projects in Vancouver that combine financial pragmaticism, heritage sensibility and green design principles. Secondly, it showcases and discusses fourteen themes within the dialogue between heritage conservation and sustainable development.

The selected case studies include a variety of projects: institutional, single family residential, industrial conversion and multi-family residential.

Each case study highlights a number of the fourteen themes; although many of the themes are present in each case study, we chose to focus on those that are best expressed in each project.

Happy reading!

November 2010
executive director Diane Switzer

further reading:

Kluckner, Michael. Vancouver Remembered. [Vancouver], 2006.
Mackay, David. 2009. Sustainable Energy without the Hot Air. withouthotair.com
Rypkema, Donna. “Sustainability, Smart Growth and Historical Preservation” 2007 Historic Districts Council Keynote Address. 2007
Much of our modernist heritage was built in a time when energy was cheap, active climatic controls common, and the economic functionalism of modular, mass production dominated over durability. These characteristics are opposite to what are today considered sustainable design: natural ventilation, passive thermal controls, and durable construction techniques. Originally built in 1961, the Friedman Building is a typical modernist building. Its successful 2008 rehabilitation shows that despite the short-term thinking of the era during which it was constructed, a sensitively designed retrofit can transform such buildings to suit today’s users as well as fulfill contemporary notions of a sustainable building.

Mark Ostry, Principal Acton-Ostry Architects

passive strategies
smart material selection
daylighting
efficient energy systems
urban densification
creative recycling
rethinking spaces
prioritizing community
sensitive adaptation
balancing high performance + character
retrofitting historic architecture
green building rating systems
adaptive reuse
economic feasibility

building at a glance

<table>
<thead>
<tr>
<th>building name</th>
<th>Friedman Building</th>
</tr>
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<tbody>
<tr>
<td>location</td>
<td>2177 Wesbrook Mall</td>
</tr>
<tr>
<td>size</td>
<td>6,250 m² (67,274 sf)</td>
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<tr>
<td>original building</td>
<td>1961/1967</td>
</tr>
<tr>
<td>rehabilitation</td>
<td>2008</td>
</tr>
<tr>
<td>original use</td>
<td>Department of Anatomy</td>
</tr>
<tr>
<td>new use</td>
<td>Department of Physical</td>
</tr>
<tr>
<td></td>
<td>Therapy, School of</td>
</tr>
<tr>
<td></td>
<td>Audiology &amp; Speech</td>
</tr>
<tr>
<td></td>
<td>Sciences</td>
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<td></td>
<td>teaching and research</td>
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<td></td>
<td>labs</td>
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<tr>
<td>cost</td>
<td>$19 000 000</td>
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building team

<table>
<thead>
<tr>
<th>owner</th>
<th>UBC</th>
</tr>
</thead>
<tbody>
<tr>
<td>architect</td>
<td>Acton-Ostry Architects Inc.</td>
</tr>
<tr>
<td>contractor</td>
<td>The Ledcor Group of Companies</td>
</tr>
<tr>
<td>electrical engineer</td>
<td>MCW Consultants</td>
</tr>
<tr>
<td>mechanical engineer</td>
<td>MCW Consultants</td>
</tr>
<tr>
<td>landscape architect</td>
<td>Phillips Farevaag Smalenberg Inc.</td>
</tr>
<tr>
<td>structural engineer</td>
<td>Read Jones Christoffersen Ltd.</td>
</tr>
<tr>
<td>commissioning agent</td>
<td>Western Mechanical Services (1977) Ltd.</td>
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<tr>
<td>building envelope</td>
<td>Read Jones Christoffersen Ltd.</td>
</tr>
<tr>
<td>sustainability + LEED</td>
<td>Recollective</td>
</tr>
</tbody>
</table>

The Friedman Building at a glance

“Heritage is the essence of sustainability, it is a natural fit.”

Mark Ostry, Principal Acton-Ostry Architects

- smart material selection
- daylighting
- efficient energy systems
- urban densification
- creative recycling
- rethinking spaces
- prioritizing community
- sensitive adaptation
- balancing high performance + character
- retrofitting historic architecture
- green building rating systems
- adaptive reuse
- economic feasibility

The Friederick Building

modernist architecture & sustainability
The Friedman project converted medical labs and teaching rooms into a new home for the Department of Physical Therapy and School of Audiology & Speech Sciences. The new space is composed of large, bright teaching spaces and faculty offices connected by articulated circulation elements featuring social spaces and breakout seminar rooms. Targeting LEED-Gold, the rehabilitation project is a credit to both Acton-Ostry Architecture and UBC. Importantly, the project was a part of the UBC Renew program, an innovative financing model that is able to produce like-new buildings in existing structures, not only preserving the campus’ heritage assets but also greatly reducing deconstruction waste and saving the university millions of dollars in capital construction costs.

Modernist architecture is not suited to be restored to its original condition. It is best to rehabilitate or renovate using best practices in sustainable design while integrating its heritage character. The Friedman project is an excellent example of how we can respect the heritage aspects of a modernist building while still pushing our built environment towards a more sustainable future.

**Defining terms:**

**Preservation:** The process of protecting, maintaining and stabilizing the existing materials, form, and integrity of a historic place, while protecting its heritage value.

**Rehabilitation:** The process of making possible a continuing or compatible contemporary use of a historical place through repair, alterations or additions, while protecting its heritage value.

**Restoration:** The process of accurately revealing, recovering or representing the state of a historic place, as it appeared at a particular period in its history, while protecting its heritage value.


vancouverheritagefoundation.org
Like many North American universities, the University of British Columbia underwent a dramatic post-war expansion as a result of demographic pressure. In 1950, the recently founded Faculty of Medicine hired a young Dr. Sydney Friedman to head the newly formed anatomy department. Initially, the Faculty of Medicine was housed in converted army huts near the centre of campus. A committee advocating a more permanent solution was quickly convened, with representatives from all departments, including Dr. Friedman. Goals for the new “Medical Sciences Buildings” included:

- an on-campus location close to the future hospital
- buildings that are “economically and realistically planned to give maximum floor space for the available funds”
- buildings “designed in such a manner that small or large units can be added from time to time at minimum cost.”

‘Sustainability’, with all of its contemporary meanings was not a factor; rather, the buildings had to be expandable, economically efficient and on-campus. An early attendee of these meetings was Fredrick Lasarre, the head of UBC’s newly formed School of Architecture. He suggested that a “generous” budget of $20/sf would include furnishings, site work as well as construction. Initial plans for the Medical Sciences complex included departmental teaching space, administrative offices, four 120-person lecture halls, a medical library and a student lounge. Consequently, the UBC Board of Governors set aside two million dollars for the project.

Over the following years, five separate schemes were suggested by university architects Thompson Berwick and Pratt, ranging from a central tower surrounded by low-rise departmental structures to one large mat building containing the entire program. Costs mounted and the program had to be cut out, with a final scheme consisting of three very basic, modular, slab-shaped buildings aligned with University Boulevard. Exterior infill panels alternated between coloured porcelain panels, aluminum windows and some glazed brick. Interior finishes were limited to painted concrete block, basic resilient flooring, and acoustic ceiling panels. The large lecture halls and administrative space had been cut, as well as the library and student lounge. Despite this, the estimated cost for this truncated scheme had climbed to $2.9 million, even with only 80% of interior spaces finished. In spite of these concerns, the project was approved for tender by President Norman Mackenzie and the Board of Governors in the fall of 1959.

Further cuts were forthcoming. By the time the project had been completed in 1961, even the venetian window blinds had been removed to allow for the painting of the concrete block. Indicative of the quality of original materials and finishes is the phrase, “Don’t ask us why the buildings are so ugly -- ask the architects”, found at the bottom of a temporary departmental directory dating from the opening of the building.

The addition of a library, dentistry building and lecture hall were carried out between 1961-1967, with the whole complex being connected by 1976. In 1981 the Medical Sciences Building Block “B” was renamed the Friedman Building.

---

**History of the Friedman Building**

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1949</td>
<td>UBC faculty of medicine founded</td>
</tr>
<tr>
<td>1955</td>
<td>Medical Sciences Buildings proposed</td>
</tr>
<tr>
<td>1959</td>
<td>Construction begins</td>
</tr>
<tr>
<td>1961</td>
<td>Medical Sciences Buildings opened</td>
</tr>
<tr>
<td>1964</td>
<td>Woodwards Biomedical Library expansion opened</td>
</tr>
<tr>
<td>1967</td>
<td>J.B. Macdonald Dentistry Building opened</td>
</tr>
<tr>
<td>1981</td>
<td>Medical Sciences Building Block C renamed the Friedman Building</td>
</tr>
<tr>
<td>2008</td>
<td>Acton-Ostry led renewal project complete</td>
</tr>
</tbody>
</table>
In 1946, Fredrick Lasarre wrote that Thompson Berwick Pratt must “decide between (an) imitation gothic and frankly and honestly modern” architecture for the UBC campus. The ‘gothic’ style is characterized by heavy masonry and was the dominant pre-war architectural influence at UBC. However, following the over-budget 1945 Hennings Building and the rising cost of masonry construction, the simplified forms and economic imperative of the new modernist movement were endorsed by UBC.

The Modern period of architectural production is considered to be between 1940-1975. Following the mantra “one world, one climate” and the lure of seemingly limitless cheap energy sources, buildings from this period are considered to be the biggest energy hogs in the built environment. The Friedman Building was completed in 1961, and as such is reflective of this time. Modernist, institutional architecture is characterized by repetitive, modular elements, expanses of single glazed metal-framed windows, preconstruction drawings, offices, mechanical equipment, teaching areas, circulation, original corridors, main entry.

modernism
An architectural movement that occurred between the 1930s and 1970s. Characterized by a belief in the power of architecture to cause positive social change through the application of industrial techniques of invention, mass production, modularity and efficiency.

1 Thompson Berwick Pratt fonds, UBC archives
a focus on economic efficiency and industrial means of production and a heavy reliance on artificial, forced air temperature and ventilation systems over natural ventilation or radiant heating.

Curiously, these characteristics of modernism also make rehabilitations a logical fit with contemporary notions of sustainability. Narrow concrete or steel floorplates offer good opportunities for natural ventilation and daylighting while concrete structures allow more flexibility in space planning than load-bearing brick or masonry walls. Modular elements mean a solution can be repeated again and again, allowing economies of scale to reduce the cost of a retrofit. Inefficient, aluminum windows can easily be replaced with updated, double glazed, thermally broken versions that mimic the minimalist profile of the original. As architect Mark Ostry says: “Maintaining wood windows should be not a question; but is there culture in aluminum windows?”. Forced air systems can be retrofitted with more efficient boilers, heat recovery units, or with hydronic, radiant heat panels.

In the case of the Friedman Building, the regular, rectangular shape and concrete structure allowed the interior layout to be dramatically altered to reflect the needs of the new School of Audiology and Physiotherapy. Mechanical system upgrades were an easy energy-saving decision, and new windows meant a tighter, more comfortable building delivered on time and on budget.

Energy reductions achieved through retrofitting

<table>
<thead>
<tr>
<th>Kilowatt/day per person (kW/d)</th>
<th>Power Usage Based on Average, Uninsulated Detached Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>53 kW/d</td>
<td>+ roof insulation</td>
</tr>
<tr>
<td>43 kW/d</td>
<td>+ wall insulation</td>
</tr>
<tr>
<td>30 kW/d</td>
<td>+ double glazed windows</td>
</tr>
<tr>
<td>27 kW/d</td>
<td></td>
</tr>
</tbody>
</table>

**Modernism, Windows, and Heritage**

**The Question**
Is it best practices to replace and landfill or rehabilitate the existing windows in a heritage project?

**Considerations**
What is the existing window’s embodied energy?
How do windows define a building’s character?
What are the potential energy savings?
Will replacement windows diminish maintenance costs?
How long will the new windows last vs. the existing units?
Are there alternate ways to achieve energy efficiencies?

**Glazing**
Replacing single-pane with double-glazing is a common energy-saving strategy. However, the actual energy savings vs. the production energy of the new window are so incremental that it is often better to simply retrofit a storm window or a second layer of single glazing to the existing glazing units.

**Wood Frames**
Generally speaking wood windows are worth repairing and selectively rehabilitating before replacing with new units. If replacement is necessary, use wood over PVC products. Properly maintained wood windows can last 200 years or more, at which point the wood is able to decompose and re-enter the biosphere.

**Steel or Aluminum Frames**
Steel or aluminum frame windows may be worth rehabilitating, although the inherently poor thermal qualities of steel and aluminum can make meeting contemporary energy-efficiency standards difficult. Replacement with thermally broken, double glazed units may be the best option.

**Alternate Energy Strategies**
Re-sealing, adding a low-emissivity film, storm windows, installing shutters, blinds, or curtains are alternate strategies to increase the thermal performance of your glazing.
moderndist facade retrofits: the Friedman Building

**definitions**

**AIR INFILTRATION**
The most effective strategy to reduce heat loss in an older building is to reduce air infiltration, or drafts. Rather than replace windows, try sealing and repairing them with weather stripping or new hardware. (The Green Guide to Historic Buildings, Prince’s Regeneration Trust, 2010)

**LIQUID WATER BARRIER**
It is important to keep liquid water from penetrating and soaking into the building’s envelope as it can cause rot, mould and greatly contribute to the deterioration of a building. Typically this function is performed by a building’s cladding, although is important to detail any openings like windows or doors properly.

**AIR/MOISTURE BARRIER**
An air/moisture barrier is the material that mitigates air infiltration-related heat losses. The most common materials used are plastic sheeting, although there are numerous other means to achieve the effect such as sealed drywall or plywood.

**SOLAR HEAT GAIN**
When the sun’s radiation directly hits a window, a portion of the heat is deflected and absorbed by the glazing. Once the radiation encounters an object inside the room, it changes shape into long-wave radiation, which is unable to penetrate glass. This heat stays in the room like in a greenhouse. This is solar heat gain.

---

**Shading the Friedman Building 1955**

March 20: Louvered sun shades, “like in Europe and South America” is suggested

March 24: Alsco aluminum products rejects sun shade design as “not effective and not economical”

Oct 19: Energy study recommends sun shading

Oct 22: TPB suggests sunshades “aesthetically complicate facade” and should be excluded

Feb 18: Tenders are over budget, sun shades cut from project

---

**RENEWAL FROM THE OUTSIDE**
1961 building

- **EXTERIOR INSULATION**
  - Existing porcelain panel exterior finish is removed and spray-on insulation is applied to act as thermal, water and air barrier. Porcelain panel then reattached to new stand-off clips.

- **BLINDS**
  - Blinds help to mitigate summer solar heat gains.

- **WINDOWS**
  - Unsealed, leaky single glazed aluminum units replaced with aluminum frame thermally broken, double glazed units.

- **OPERABLE WINDOWS**
  - Maintaining windows that open allows natural ventilation and temperature control of the interior space.

- **INTERIOR INSULATION**
  - In case where the exterior panels are not easily removable, insulation can be applied from the inside.

---

**RENEWAL FROM THE INSIDE**
1967 building

- **SOLAR HEAT GAIN**
  - ‘Brise-soliel’ or sun-shade louveres were popularized by architect Le Corbusier in the 1933 to offset the solar heat gain caused by modernism’s large expanses of glass. In 1955, the Friedman project considered their use.

- **AIR INFILTRATION**
  - The most effective strategy to reduce heat loss in an older building is to reduce air infiltration, or drafts. Rather than replace windows, try sealing and repairing them with weather stripping or new hardware.

- **LIQUID WATER BARRIER**
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**1956 1959 1960**

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- **March 24:** Alsco aluminum products rejects sun shade design as “not effective and not economical”
- **Oct 19:** Energy study recommends sun shading
- **Oct 22:** TPB suggests sunshades “aesthetically complicate facade” and should be excluded
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**New Section Page Dimensions: 612.0x792.0**

- **Image:** [Image 573x763 to 602x781]
- **Image:** [Image 0x-0 to 612x216]
- **Image:** [Image 589x11]
- **Image:** [Image 525x219]
- **Image:** [Image 574x372]
- **Image:** [Image 526x323]
- **Image:** [Image 577x481]
- **Image:** [Image 526x491]
- **Image:** [Image 577x585]
- **Image:** [Image 526x671]
- **Image:** [Image 534x561]
- **Image:** [Image 526x671]
- **Image:** [Image 534x561]
- **Image:** [Image 511x36]
- **Image:** [Image 428x36]
The renewal of the Friedman Building is poised to become among the first modernist heritage buildings in Canada to achieve the Canada Green Building Council’s LEED for New Construction: Gold certification. UBC Renew design guidelines require LEED: Silver certification; the potential achievement of gold level is a bonus for the Friedman Building and Acton-Ostry Architects.

When considering heritage projects, green building rating systems and heritage rehabilitation are often at odds. Rating systems generally prioritize the quantitative aspects of ‘high-performance’ and energy efficiency over the more qualitative, social and cultural aspects of a heritage building. Little or no credit is granted to heritage projects that make the decision to maintain an existing structure or facade, especially given the greater immediate construction costs and design challenges that heritage rehabilitation can entail. This is despite the massive contribution heritage projects of all kinds make to the cultural memory and fabric of our built environment and diversion of waste from the landfill that are a part of keeping and an existing structure.

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**LEED+ heritage**

**LEED**

---

**life cycle analysis and costing (LCA)**
Life cycle analysis is a means of accounting for the cost and energy required to produce, maintain and dispose of a building or product. It includes the resources required for the manufacture, and the CO2 equivalent output, water and air pollution created by the production process. For buildings, tools such as the Athena Ecocalculator make the LCA process easier.

---

**reusing the existing building means:**

- 11.5 million gigajoules of energy saved
- 822 tonnes of CO2 not emitted
- 1.5 million kg of waste diverted from landfill
- 560 000 kg of coal saved in the production process
- 500 000 L water saved in the production process
The Friedman energy model shows 284 GJ energy use and 73.4 tons CO₂ equivalent reductions/year as compared to the MNECB reference case.

Windows, envelope retrofitting, energy modelling and material lifecycle accounting form the heart of the conflict between heritage and many rating systems. From a technical perspective, replacing existing wood with new thermally-efficient vinyl windows offers only minor energy savings, while often compromising the character of the building and creating an needless landfill waste. Inappropriately piling layers of insulation onto a facade diminishes the appearance of a building’s history. The waste diversion and lifecycle replacement implications of not demolishing a perfectly functional structure are infrequently accounted for in green building rating systems. These type of conflicts - while common - are not always present.

For the Friedman Building, the decision to maintain the existing structure and facade rather than build new did offer some barriers to LEED certification, but with the creative resources of a dedicated design team and the intelligent support of sustainability consultants, Recollective, the process was relatively smooth. The LEED certification process for heritage is “easy if you are not lazy,” says Mark Ostry. As with new construction, an early commitment to the process by the owners, design team and contractor is essential for heritage projects.

**energy modelling**

Energy Modelling is a tool designed to assist owners and design teams make better decisions about a building. First, a theoretical reference building, incorporating the essential features of the proposed design, is modelled using software. Potentially energy saving decisions can then be compared to this theoretical model.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Existing Green Retrofit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.09 GJ/m²</td>
<td>2.21 GJ/m²</td>
</tr>
<tr>
<td>1.64 GJ/m²</td>
<td></td>
</tr>
<tr>
<td>2.81 GJ/m²</td>
<td></td>
</tr>
<tr>
<td>2.21 GJ/m²</td>
<td></td>
</tr>
<tr>
<td>0.80 GJ/m²</td>
<td></td>
</tr>
</tbody>
</table>
The Friedman Building

Originally, the Friedman Building housed numerous laboratories, teaching labs and offices for the Department of Anatomy and the Cancer Institute. Staff offices were located on the north side of the building to mitigate solar heat gain during the summer months, with teaching labs on the southern edge where solar gain would not affect the occupants during the colder winter months. Dividing the two spaces was a linear corridor, flanked by numerous floor penetrations for the gas, water and vacuum lines, mechanical ductwork and waste removal. Originally, this corridor was naturally lit from the fully glazed fire stairs at each end, but when the 1967 addition of the Woodward’s Biomedical library closed off one end, this space became an artificially lit, institutionally unfriendly space.

For Acton-Ostry, a corridor “should be more than a means of travelling through the building” and so they included social/study nooks by varying the corridor’s width. To achieve higher daylight levels and to connect those working in the offices to the rhythms of movement and inhabitation taking place in the corridor, frosted glazing partitions were used between the offices and the corridor. The result is a pleasantly illuminated circulation space, punctuated by intimate study spaces.

The Friedman Building

First level (after rehabilitation)

1. entry
2. lobby
3. corridor
4. physical therapy laboratory
5. administration
6. faculty
7. lounge
8. physical therapy exercise
9. lockers
10. study
11. seminar
12. audiology laboratory
13. classroom
14. washroom

Second level

11. seminar
12. audiology laboratory
13. classroom
14. washroom

STRUCTURAL FLEXIBILITY
The modernist concrete post and beam system allows large teaching spaces with a minimum of new load-bearing elements.

GLAZED PARTITIONS
Corridor space, previously an unfriendly, artificially-lit space is now illuminated through the glazed partitions that make up many corridor walls.

VERTICAL RETENTION
The basic form of the building allows new program to be seamlessly integrated into the existing staircases and elevator cores.

SPACEMAKING
The removal of much of the mechanical equipment opened up space for the new program.

Opportunities for a community of students, staff and faculty are created by the articulation of the corridor and the introduction of study nooks.
The 1976 joining of the Friedman Building to the recently completed JB Macdonald Building shifted the centre of the building to the connecting wing and its large lecture theatre. Acton-Ostry’s rehabilitation acknowledged this transition by opening up the east end of the building into large teaching spaces, balancing out the lecture space while creating a large, daylight space suitable for a variety of teaching functions.

**BEFORE** - low daylighting, no connection between corridor and adjacent spaces

**AFTER** - daylighting, connection between corridor and adjacent spaces
UBC Renew is a highly effective means of addressing the need for new on-campus teaching and learning spaces while simultaneously retaining the heritage fabric of the campus community in an economically viable way. Given the fact that 60% of UBC buildings are thirty years of age or older, the UBC Renew program is designed to mitigate deferred maintenance concerns, increase the capabilities of existing space, and preserve campus culture by retaining heritage buildings.

Started in 2005 in partnership with the Province of BC, phase one of the funding has been used to rehabilitate several buildings on campus, including the Friedman Building. Throughout the building boom of the post-war years through to the 1970s, capital renewal funding did not keep pace with maintenance requirements, leaving UBC with a legacy of buildings that did not meet fire and life safety requirements as well as spaces that were no longer suitable for contemporary research and teaching needs. This is known as ‘deferred maintenance’. Public institutions often defer maintenance when faced with a demand for new space combined with limited budgets and funding constraints.

defered maintenance

deferred maintenance is an accounting designation that indicates monies previously allocated to the maintenance of an asset were reallocated to reflect new budget or spending priorities.

Friedman Building cost analysis _2008

cost of building new: $31.7 million
cost of rehabilitation: $19 million

COST SAVINGS $12.7 million

UBC Renew program has saved BC taxpayers $88 million in capital construction costs since 2004

“UBC Renew”, UBC Office of Sustainability
cutbacks. At UBC, a building is considered for renewal if it can be rehabilitated to a like-new condition for two-thirds of the cost of a new building. The UBC renew program also targets LEED silver certification at a minimum for all Renew projects.

As with all older structures, current earthquake codes generally require extensive seismic upgrading. The cost of this can often dissuade owners from a rehabilitation of an existing structure in favour of simple demolish and re-built. Modernist buildings are no exception to this rule, although their concrete and steel construction is often more amenable to such upgrades. For the Friedman Building, seismic requirements offered a chance to showcase the renewal of the building in a highly visible way while paying homage to the architectural style of the original era.

Acton-Ostry introduced a buttress-like element to the south-east corner of the Friedman building in order to resolve concerns around lateral stability. However, rather than simply introduce a contemporary steel or concrete frame element to the building, Acton-Ostry sensitively inserted a rough, board-formed concrete buttress in the Brutalist style of the era. This not only becomes an exterior, visible sign of the updated building, but also serves as the new fire stair for the wing, again evocative of the transparent exterior fire stairs present in the original 1959 building.

Mark Ostry, principal Acton-Ostry Architecture

“UBC renew means for every four projects, you get five.”

1. Average Cost + Savings
2. BC Binning Studio (1925)
3. Dorothy Somerset Studio (1925)
4. Buchanan Building C (1958)
5. Buchanan Building D (1960)
6. Buchanan Building A (1958)
7. Buchanan Building B (1958)
10. Auditorium Building
11. Chemistry Building (1923)

how UBC selects a renew project
1. Is there a high demand for type of space?
2. Renewal cost must be less than two-thirds of replacement cost
3. Must meet Facility Condition Index criteria (current replacement cost vs. existing cost of deficiencies)

UBC renew program

“UBC renew means for every four projects, you get five.”

Mark Ostry, principal Acton-Ostry Architecture

1. Is there a high demand for type of space?
2. Renewal cost must be less than two-thirds of replacement cost
3. Must meet Facility Condition Index criteria (current replacement cost vs. existing cost of deficiencies)
When Stephanie Maingot and John Flipse bought this four-storey home, it had already housed dozens of families. Like many homes on this street, it started out as an upper-class residence, but after two world wars, an economic depression, and shifts in demography, it became difficult for just one family to sustain. In 1951 this home was converted into a duplex, a common trend in many large single-family dwellings of the time; often a necessary adaptation to the increased demand for housing and higher cost of living in Vancouver post-World War II.
For John and Stephanie, the existing rental unit on the upper two floors made the purchase of the home and the mortgage payments feasible in an inflated real estate market. They settled in the lower level suite, which comprised 1000 sf of habitable space, and accepted the reality that they had just bought a typical drafty old house, in which the winter months are barely liveable. When their family expanded with the birth of their son, they looked to the basement, previously a dank, dark rabbit Warren of many tiny rooms for additional living space. In 2005, they made the unconventional and creative decision to relocate their bedrooms and home office to the basement. This nearly doubled their living space and allowed the main floor to return to its historical function as reception rooms.

The removal of an existing forced air heating system to open up headroom in the basement was an opportunity to rethink their heating system. They choose underfloor water-based radiant heating over electric baseboard as the replacement heating system. This new system not only halved their monthly heating costs but also produces a comfortably inviting heat. They introduced salvaged hot-water radiators to reinforce the heritage feel of the home. A similar attitude towards material preservation and re-use led the owners to creatively incorporate salvaged bannisters, doors and vanities to achieve an aesthetic more akin to an urban loft than a detached, duplex home.

“we decided to use every square inch of space”
Basements have a poor reputation for creating desirable space. Understanding this made John and Stephanie prioritize comfort, light and spatial efficiency for their project. Rooms and windows have been carefully placed to maximize connection to the outdoors, as in the master bedroom, laundry room and common space. Storage and mechanical spaces that formally dominated the basement have been carefully repositioned to allow a more human-centric habitation. New underfloor insulation and an effective moisture barrier combined with in-floor radiant heat to create a comfortable, dry space in a typically damp part of the house. The basement was transformed from an unlivable, dark space suitable only for storage into an integral part of their daily lives.

“go and hire an architect, right now”
During the basement’s renovation, they installed radiant in-floor heating beneath the original fir flooring planks of the main floor and under a newly poured polished concrete floor in the basement. The owners replaced two inefficient hot water tanks and two old furnaces with one high grade boiler system. They either removed or sealed all forced air ducting in both units. They installed salvaged radiators to heat the rental unit. This cutting-edge boiler system discreetly provides for all the hot water and heating needs of the entire house. The introduction of this efficient energy system has halved their heating bill making the mostly un-insulated home cozy even in the coldest months of the winter.

Aluminum transfers heat more easily than air. Thus the heat moves from the radiant tubing directly into the fir-flooring through the aluminum brackets. The warmed, wood surface then radiates the heat upwards. Insulation and air space located below the tubing prevents too much heat radiating towards the basement below, which has its own in-floor hydronic system below the concrete flooring.
The radiant heat has also retrospectively solved another conflict which is so common in old homes. The forced air system was blowing hot air which was immediately lost through the leaky, cold surfaces of the home’s single-pane, historic windows. The new type of heating system warms the floor and radiates from it, as opposed to raising the temperature of the air; making for a cleaner, more even heat that allows the original windows to function at their best. The elimination of the inefficient furnace system not only allowed for gained ceiling height in the basement through the removal of its cumbersome ducts but also “took the pressure off” the home’s beautiful double-hung wood windows, which when maintained properly, can easily have a lifespan of 200 years.

Zoning allows heating and cooling loads to be customized using individualized digital thermostats for each room or area. Because water carries heat much more efficiently than air, smaller zones are made possible than with an air-based system. When combined with a digital thermostat, heat can be directed exactly where it is needed, saving on heating costs and energy use.

**Boiler type:** Laars Endurance  
**Heating coils:** 1/2” hePEX  
**Accessories:** Wirsbo Joist Trak

**why choose radiant heat?**

FORCED AIR raises the ambient air temperature to make you feel warm. It is drier, and can be dustier but does respond more quickly to thermostat adjustments.

RADIANT HEAT is experienced directly on your skin. The ambient air temperature can be cooler, but you will still feel warm. It is a comfortable heat (think campfire) and is more energy efficient. However, it does not respond as quickly as a forced air system.

**BEFORE**

$195/month heating + hot water

**AFTER**

$350/month heating only
Like previous occupants, the owners find it a convenient pleasure to live in a historic neighbourhood near Commercial Drive, which offers public transportation and a plethora of local grocery markets, shops and cafés. Historically a working class neighbourhood, today the area is a vibrant, mixed-income neighbourhood. It has seen an increasing number of detached homes cleared to make way for low-rise apartments and townhomes due to rising land costs and a sensible municipal focus on urban density over suburban sprawl. The Charles Street case study offers an alternate example of density through the inclusion of secondary suites, student rooms, laneway homes and multiplex conversions to existing homes.

For most families, the largest purchase they will make is their home. The second largest purchase will be any renovations they carry out to this home. The additional upfront cost of investing in a good designer, cost-saving systems such as in-floor radiant heat, or deciding to maintain and upgrade an existing building before demolishing and building new can be daunting. A simple payback calculation showing a long cost recovery period can make these decisions even more difficult. However, the social role of a home as the centre of a growing family, and the desire to maintain a heritage feel made John and Stephanie’s decision easy. As a result, they have a comfortable, flexible, future-friendly home that can respond to their needs as well as providing additional income with space for a tenant and student.
When choosing finishes for their new space, John and Stephanie’s priorities were to maintain a heritage feel, while still being conscious of a contemporary aesthetic. A focus on both pragmatics and aesthetics led them to choose durable, warm finishes for the new downstairs living spaces. Integrating specific elements of a salvaged building from an off-site location into a new project can be challenging. Sizing does not always match or there may be an uneven or unusual number of a certain item. John and Stephanie’s creative spirit meant that these challenges became opportunities to express their desire for a beautiful, lived-in space.

### creative concrete

Acid-stained concrete floor keeps allergies at bay, is easy to maintain and clean and allows in-floor heating to operate at maximum efficiency.

### salvaged structure

Structural upgrades required an additional post in the basement. A salvaged post matches the existing and adds to the heritage aesthetic.

### fine furniture and fixings

John modified a vintage cabinet into a beautiful washbasin. Original hardware and doors are stripped for reuse. The old garden gate makes a feature on the outside deck.

“why should we cover up these beautiful materials?”
From the outside the Yaletown offices of renowned architects Busby Perkins + Will are unassumingly simple. Originally designed and built in 1946 as a biscuit warehouse and factory, the ordinary-looking facade is composed of painted concrete punctuated by narrow, wood-frame windows. Bright green wall-boxes, intended to test vertical urban gardens, hang beside each window. They are the only indication of the exciting, experimental intervention that has happened inside.
In his seminal work, *How Buildings Learn*, Stewart Brand suggests there are high-road, low-road and no-road buildings. The ‘high-road’ buildings are those that are iconic and expensive, like churches or train stations. Communities tend to tenaciously support their preservation because they are beautiful and unique. At the opposite end of the spectrum are the ‘low-road’ buildings, those that were built in a highly functional manner and offer flexible floorplans like warehouses or factories. In between these two are a wide variety of ‘no-road’ buildings; those that are too specialized, not well built, or of an undesirable style or era. Heritage buildings span all of these categories and each requires a unique kind of intervention.

The Vancouver offices of Busby Perkins + Will demonstrate the creative possibilities of the ‘low-road’. Originally designed to support the heavy loads of machinery and storage, the structural concrete frame required few upgrades to become an architectural office.

The most substantial intervention to the building was the cutting of a four-storey atrium from roof to ground floor. It was sized to provide every workstation with natural daylight and air circulation. Operable skylights pour light into the formerly gloomy floorplates. A second cut was made by the front door to create a triple height welcome area, and to assist with the natural ventilation and daylighting of the whole office. Supplemented by two heat-recovery ventilators and a small quantity of electric baseboard, the bulk of the office’s heating needs are provided by the interaction between the body heat and activity of the occupants, and the thermal mass of the exposed concrete finishes. There is no artificial chill of air-conditioning or blasting of a hot-air system. As a consequence of this passive approach to design, the office uses a third of the energy of a comparable building in the downtown core. In the interests of economy, aesthetics and waste reduction, finishes were limited to sandblasted concrete, recycled-tire flooring, steel details and glazed balconies. The resulting office environment is comfortable, productive and welcoming, while also incorporating green design principles; truly representative of the design ambitions of a successful and growing firm, concerned with designing a better future.
Homer Street first appears in 1887 on a Canadian Pacific Railway survey map that established the streetscape of much of the Vancouver peninsula.1 Like many other streets in the area, it was named after a prominent figure in the provincial government, New Westminster MP Joshua Homer. At this time the neighbourhood was slated to be an industrial area due to its proximity to the CPR rail lines occupying the northern bank of False Creek. In 1946, Walter Townley applied for a water permit to build a warehouse and office at 1220 Homer Street and constructed a plainly functional building, as a biscuit and chocolate warehouse. Over the years numerous businesses occupied the building, but following the redevelopment of Yaletown after Expo 86, the neighbourhood changed character, and in 2000 the commercial building was up for sale.

By this time, architect Peter Busby and his associates had been actively practicing for more than fifteen years and his growing firm was looking for new office space. This old building gave them an opportunity to expand as well as apply their belief in socially responsible architecture and the greening of our built environment.2 The building at 1220 Homer Street was now fifty years old, and reaching the end of its effective lifespan as a warehouse. The character of the area had changed from industrial to a mixed-residential and commercial neighbourhood, and contemporary warehousing standards were vastly different. With their rehabilitation of the building, Busby and his associates extended the lifespan of this rather ordinary, dilapidated structure by decades. They saw the potential spatial flexibility of the interior; recognized the value in maintaining the historic fabric of the neighbourhood, and worked to economically create a space suitable for the needs of their expanding architectural practice. The result is a beautiful, effective rehabilitation of an existing heritage building.

1 Hayes, D. Historical Atlas of Vancouver, [2005]
An atrium is a space that vertically connects several floors for the purposes of light, visual connection and ventilation. At Busby, Perkins + Will, this space is intended to be highly flexible as well as serving as the ventilation and heating system. Generally used for client meetings (five can occur simultaneously without disturbing each other), the atrium is also used for everything from yoga classes to sport-event watching and parties.

### Workstations
Custom-designed by Designlines, the workstations are composed of a system of easily reconfigurable parts. They are situated to maximize design-team communication while still providing privacy for individual staff.

### Meeting Rooms
These areas are separated from the workstations by partial-height glazing, enabling privacy while still allowing daylight to reach both areas.

Preserving the freight elevator and existing stair cores saves money while also framing the composition of layout and building circulation. They also act as supplementary air shafts for the passive ventilation system and heat recovery systems.

The flexibility of low-road construction means that as the office expands, two floors can be added to the roof without a daunting amount of structural retrofits. The atrium can also be expanded into the basement for additional space. In the meantime, the roof has become a live-testing area for experimental cladding materials and other building science explorations.

“We took our design cues from the building”

David Dove
Principal, Busby Perkins + Will
Busby Perkins + Will believe in a systems-based approach to design. This is clear from their office rehabilitation. At approximately 100 kWh/m²/year, the office’s energy consumption for heat, light and hot water is less than a third of an average Canadian office building and as much as six times less than the average downtown Vancouver glazed tower. This also beats the passive-building standard. There is no mechanically directed, forced-air central heating or cooling system in the building. Rather, the architecture itself acts as an integrated heating and cooling system in concert with its occupants activities. The building naturally vents heated air through the two atria in the summer, and absorbs and re-releases people’s body heat in the winter.

**Passivehaus Standard**  passivehaus.ca
The Passivhaus Institute promotes the idea of highly-efficient, passive buildings (not just houses); buildings that use very little active heating or cooling systems.

**Living Building Challenge**  ilbi.org
The Living Building Challenge is an initiative of the Cascadia Region Green Building Council to encourage the design of beautiful, net-zero energy and water-use buildings.

**Automatic vs. Manual Temperature Controls**
Should a heating system be manually or automatically controlled? Generally speaking, manual controls encourage personal responsibility for heating and cooling needs. “Treat your building like your home” says David Dove. However, these controls need to be accessible and the users need to be educated. 1220 Homer St. uses a live, internet-accessible ‘dashboard’ system to display and track water and energy use, which helps with individual and group accountability.

**Building Energy Intensity Index**

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<tr>
<th>1220 Homer St.</th>
<th>Living Building Challenge</th>
<th>Passivehaus Target</th>
<th>Average BC Building</th>
<th>Average Vancouver Office</th>
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<tbody>
<tr>
<td>Kw/m²/year</td>
<td>100</td>
<td></td>
<td></td>
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The stairways act as additional natural ventilation stacks. Two heat recovery units were installed to recapture heat from the kitchens and bathrooms as well as the heat generated by computers, lights and occupants, and return it to the building. Using minimal-energy strategies is also made possible because of the building’s original concrete ceiling and walls. The thermal mass of concrete tends to slowly absorb both heat and cold and then equally slowly re-radiate the heat or cold into its surroundings. Utilizing the concrete to regulate the temperature also minimized finishing materials. Often finishes are used in an office to hide potentially unsightly service spaces or aesthetically ‘inferior’ surfaces. Sandblasting the rough concrete and careful placement of the utility services made the space aesthetically pleasing. To work with the heat recovery system, workspaces and service spaces are separated. This allows clustering of heat-generating elements (bodies, computers) further reducing energy use. The roof was also retrofitted with insulation to help with heat retention throughout Vancouver’s mild winter.

**cooling**

1. Fresh, cool air is drawn in from the outside through operable windows on facades of buildings.
2. As the air passes through the office, it is naturally warmed.
3. The warmer air rises via the stack effect through the central atrium and is vented by the operable skylight.

**heating**

1. Supplementary heating is provided by baseboards, heat-recovery units and a few small radiant heaters.
2. Staff activity produces heat, which is absorbed and re-released by the thermal mass of the concrete.
3. Fresh air for ventilation is pre-heated and drawn into the building through the heat recovery units.

**the stack effect**

The ‘stack effect’ is caused by the natural tendency of hot air to rise and cool air to sink. Connecting floors with atria, shafts, and stairwells can take advantage of this natural behaviour to move air and heat around a building. These connecting spaces must be effectively sized, and linked to operable windows to function as ventilators that are able to naturally provide fresh air and remove stale air from a building.

**thermal mass**

“Thermal mass” means any kind of material that is able to absorb heat slowly, and then release it over a long period of time. Durable materials like stone, brick, ceramic and concrete are common examples of thermal mass, although water can act in a similar way in larger quantities. Thermal mass helps to naturally regulate the temperature swings in an environment, as it is able to trap heat when it is hot, and then release the same heat when the surrounding temperature is lower.
sandblasted concrete
Sandblasting can be a low-impact way of retaining the industrial aesthetic of an existing building while providing the benefits of an exposed thermal mass. Acoustics can be problematic with these types of hard, exposed surfaces, but this can be mitigated with the simple intervention of hanging acoustic baffles or soft furnishings.

ceiling
While a white-painted ceiling would technically bounce more daylight into the space, the exposed, sandblasted concrete is also used as an aesthetic highlight to the glass, steel and aluminum detailing.

flooring
The reception area formally served as an office for the warehouse and was situated lower than the warehouse floor. Busby Perkins + Will raised the floor level to be more accessible from street level.

recycled content
Typically used underneath ice rinks, this attractive flooring is made of 100% recycled tires. Busby, Perkins + Will clients often request it as a floor finish for all kinds of buildings, despite its ‘usual’ application.

exposed structure + services
An exposed structure generally means exposed service ducts, electrical cables and the like. In this case, the fact that the building is naturally ventilated means there is little or no hanging ductwork and noisy fans to muffle and hide behind acoustic panels. However, careful placement of electrical services is essential to maintain aesthetic control over the ceiling. Cutting, drilling and fastening services on and through structural members also requires careful planning to avoid the ceiling falling down!
daylighting

The large, open atrium not only allows the stack effect of natural ventilation to effectively cool-down and provide fresh air to the entire office, it also pours daylight down to the ground floor. Daylight penetrates to every work station from the enormous, yet simple and inexpensively installed skylights at the top of this space. The occupants are aware of the natural rhythms of the day and seasons as sun and rain moves across the transparent skylights. The rattle of the occasional hail storm causes staff to congregate at the atrium railings in admiration. A second cut through the floor plates at the entrance adds to the daylighting of the interior space as well as providing an expansive display area for the firm’s numerous project models and awards.

Unusually, the main meeting spaces are placed in the open, underneath the atrium. One would think that this would create poor acoustics, but the subtle placement of hanging wood screens and elegant layout of the larger meeting areas mean there are few disruptions. This creates a culture of client-staff transparency, as well as gaining maximum utility out of a limited floor plate.

experimentalism

Busby Perkins + Will are committed to constant self-enrichment and learning. In 2000, when this rehabilitation project was completed, natural ventilation, daylighting and other passive design strategies were not well-understood by much of the construction industry. The first winter was very chilly, as the computer model used to size the ventilation and heating systems had anticipated a fully occupied building. However, as the staff grew and learned how to manipulate windows, ventilation and space heating, the space became increasingly comfortable while still maintaining the energy efficiency goals the firm had set. The office has become a kind of living laboratory, a testing ground for progressive design strategies. Learning from their own work environment, Busby Perkins + Will is able to apply these lessons to their design work.

“It is not precious, but we love it”

David Dove
Principal, Busby Perkins + Will
“...we want to create smart, affordable homes”, says Dick Hellofs and partner Karli Gillespie. They are talking about their new Union Street ECOheritage project: a multi-family infill conversion of two character homes in historic Strathcona Vancouver’s oldest neighbourhood. The residences are walking distance from downtown and there is potential in the zoning for transformation. Hellofs and Gillespie’s aim is to demonstrate that high-performance design is compatible with heritage conservation, increasing density and affordable housing as well as hopefully inspiring similar projects.
When Karli and Dick moved to Strathcona five years ago, they came to understand the neighbourhood’s strengths and weaknesses: centrally located and close to downtown with a strong sense of community and a great heritage feel, yet also very unaffordable for ordinary people looking to buy or rent a home. Initially they lived on the outskirts of the neighbourhood, but always wanted to live closer to the heart of the community. When the adjoining houses at 666 and 662 Union Street came up for sale, and a family member needed to downsize, they could not miss the opportunity to embed themselves in the neighbourhood as well as address concerns around neighbourhood affordability and a more sustainable future.

To Dick and Karli, sustainable living is about affordable community living, shared resources and smart, simple design. By taking two homes that currently house four individuals, transferring the density around the property and adding infill laneway housing, they are proposing to create seven units, with fifteen or more inhabitants in the same space. This will not be accomplished by demolishing and rebuilding from scratch, but rather by evolving the existing heritage homes to reflect contemporary social and economic realities. All new construction will be highly energy efficient with an aesthetic that is derived from, but not imitative of the existing structures. This will balance the energy inefficiencies of the heritage homes, while still preserving their cultural and ecological value for the community and surrounding neighbourhood. A central complex housing green technologies such as solar hot water, heat pumps will provide heat, water and services to each unit. It will also be ready for connection to any future district energy systems. An electric car-share program is proposed to reduce the transportation footprint of residents, and gardens and recycling and composting facilities will reduce the waste production of residents to less than that of the pre-existing homes.

Both the architects, Shape Architecture, and the owners of this project understand that our built heritage needs to be preserved, but that we also need to be creative and realistic: our population is expanding and diversifying at an astounding speed. Smart preservation is about preventing razing and rebuilding by evolving buildings rather than demanding the creation of museum pieces. We need to mark the present and preserve the past while still building towards the future. As proposed, this project serves as a demonstration of how to achieve density, affordability and high performance while still respecting the value of our built heritage.

“Smaller, smarter, well thought-out density without compromising the fabric of the neighbourhood”
Dick Hellofs & Karli Gillespie owners
In 1892, carpenter Wilhelm Twambly applied for water permits for 666 and 662 Union Street, then known as Bernard Street. ‘Bernard’ was changed to Union Street around 1905 to avoid confusing it with Burrard Street. Since its beginnings as the ‘Granville townsite’, the Strathcona neighbourhood has played an important role in the development of Vancouver. Initially laid out to support the operations of the Hastings Mill, civic historian John Atkin describes the area: “Strathcona, Vancouver’s first neighbourhood, has been called a slum, “home of the working man,” and absolutely charming...First simply known as the East End, the name came to have a derogatory meaning due to its mixture of housing and industry and the fact that it was the entry point to the city for successive waves of immigrants.”

Immigration, change and conflict have been determining factors in the neighbourhood. As it developed, streets were leveled and graded to facilitate the new automobile, leaving many homes -- like 666 and 662 Union Street -- set high above the new road level. Curiously, the laneways were not treated in the same way, and so they act as a living topography of the rough terrain that used to define the area.

In the 1950s and 60s the area was declared a slum and urban redevelopment schemes razed entire blocks to make way for social housing and freeways. \(^{1}\) Fortunately, residents fought these actions, leaving Vancouver with a valuable reminder of its past and a strong legacy of community activism. Today Strathcona is a diverse community including many heritage buildings with a strong sense of identity and civic pride.

Early inhabitants of 666 and 662 Union reflect the diverse occupations of what was then the Granville townsite: BC Sugar employees, engineers, master mariners, confectioners and shoemakers were all residents. Later inhabitants shifted to reflect the changing fortunes of the area with miners, loggers and labourers giving way to predominantly Asian names from the 1950s to 1980s, who in turn yielded to musicians and others in the 1990s and 2000s. The buildings themselves were included on the heritage resource inventory in 1984 as a part of the larger awareness of the importance of Vancouver’s heritage that arose during that era. Architecturally important features of the Union St. houses at that time were considered their pioneer frames, drop siding and scalloped gables, fascia trim and projecting porches.

The Union Street Eco-Heritage project proposes to maintain these character defining features, while providing a new reference point in the history of the neighbourhood. The project will reflect today’s aesthetic and social priorities and in turn transmit them to future generations of Strathcona residents.

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\(^{1}\) John Atkin, Strathcona: Vancouver’s First Neighbourhood [1994]
proposed streetscape elevations

proposed site plan

Sketch of proposed redevelopment from laneway

666 Union St.  662 Union St.

Front porches

Bike storage + recycling

Parking

Laneeway house

Laneway

Courtyard with utility room underneath

Two units

One unit

Union street

GARAGE

COACH HOUSE

662 + 666 Union St.
Before starting their project Dick and Karli asked themselves: what will our future hold, and how can we address those concerns today? Simple, responsible, smart and affordable are the four watchwords that underscore their answer to this question and consequent commitment to their project. There are unquestioned links between density, community and a low-carbon lifestyle. Typical North American suburban homes are around 2500 sf (for one family); the Union Street ECOheritage project proposes approximately 6300 sf for seven separate units, including one designated as affordable housing. The site is only 50’ x 132, the size of two Strathcona lots. Shape’s clever design fits the units into this tight space without destroying the existing buildings. However, the small footprint does bring numerous design challenges, one being the need for a careful balance between privacy and community living.

**scales of public space**

The project proposes to offer micro-topographies of community space ranging from the wider neighbourhood meeting spaces of electric car plug-in and bike route to the more intimate household spaces of courtyard and patio.

**the five minute walk**

Current best practices advocate for the ‘five-minute walk’ as a good indicator of how livable an area is. According to urban design principles, the five-minute walk is about the maximum distance most people will walk for their basic services on a regular basis. The five minute walk is about 400m, or a quarter-mile in distance.
Taking their cue from the Strathcona culture of covered porches and the natural slope of the site, Nick Sully of Shape Architecture proposes a micro-topography of outdoor spaces unique to each unit with porches, decks and patios. Each unit has a private outdoor space, yet these spaces are connected to the streetscape in the same way as the porches of the existing buildings. This will allow the inhabitants to interact with their community, while still feeling like they have their own outdoor space. This outdoor space will be based around a central courtyard, allowing inhabitants to casually interact with each other.

A community is not created solely by architecture. Dick and Karli are proposing to blend older traditions of intergenerational living and shared living with new social structures by including a variety of sized units, including one for a close family member. The inclusion of a shared electric car for owners, a centralized heating system and rainwater/greywater filtration/reuse system, recycling centre and numerous other shared resources will also save the residents money while creating a new sense of community.

**FSR: Floor-Space Ratio**

A number that reflects the maximum density allowed by law on a particular site. An FSR of 1.0 means the property's maximum density cannot be more than the equivalent of one storey building over the entire lot. An FSR of 2.0 means the property can have the equivalent density of a two storey building; FSR 3.0 is a three storey building, and so on. This density can be stacked or distributed as building in any way that respects zoning/building code requirements.

**adapting heritage**

The existing configuration reflects neighbourhood development patterns of laneway garage or coach house, central yard, additions to original house, with the house itself facing on to the street.

New units are added, while respecting the existing pattern, by removing the garage and additions to existingstructureandlifting/excavatingunderneath.

Units are inserted underneath, and a new laneway house is built.

The new configuration reflects the original pattern, while allowing new, more affordable units on the property and keeping the absolute density (allowable zoning FSR) as before.
Sensitive adaptation

Heritage design is about taking the past and extending it into the future. The social artifacts of building and neighbourhood are the inheritance of our past and are not just architecture. They are the elements that make up the social fabric of a city. Shape's work with the Union Street ECOheritage project aims to reflect, but not inauthentically imitate, the feel of Strathcona. The existing patterns of the neighbourhood such as lines of gables or the varied topography between street and laneways are heritage artifacts. The repetitive spatial sequence of coach house to yard to addition and finally to the originally constructed home is another artifact. However, Nick Sully also understands the sustainability imperative: the heritage homes were built with a specific craft, style and materiality appropriate to the cultural and economic needs of an era very different from today.

“We are trying not to imitate or emulate but rather unlock the keys to heritage design”
Nick Sully
Principal, Shape Architecture
The overall arrangement of the scheme will create a tripartite division of the property reflective of the existing neighbourhood patterns: the strong presence of the heritage homes at the front, with a contemporary addition to the rear facing on to the central, communal landscape and the laneway infill.

Details of the new construction have not yet been finalized, but Dick and Karli aim to “bring the warmth of the old into the new.” This attitude, in conjunction with Shape Architecture’s creative application of the new to the old should mean a sensitive, pleasing result that can serve as an example of how to densify a heritage property in the Strathcona neighbourhood in a low-impact way.

crafting the details

In the same way as craftsmen built their homes in past eras with a particular skill and material choice based on what was available and their own knowledge, Shape Architecture believes their work has to respond to the cultural and economic context of our era. In previous projects they aligned solar hot-water heaters at the same angle as adjoining gables or mixed hardi-plank sizes and patterns rather than falsely replicate existing lapped siding, among many other clever and pleasing design strategies. In the past, ingenious detailing of these older houses was carried out by master craftsmen to keep the house warm and dry and resulted in beautiful layers of trim, fascias, shingles, etc. Today, flashing is as much a craft as the fine carpentry of yesterday. Perhaps contemporary projects should reflect today’s skilled work so that future generations can admire our legacy in the same way as we respect our past.
The Union Street ECOheritage project is targeting LEED:NC Platinum, Built Green: Platinum, and an Energuide 90+ designation. The majority of the energy targets for these certifications will be achieved using passive design techniques such as building orientation and window placement, thermal mass and a highly insulated envelope. However, these are not just energy saving design strategies as they also meet with the project’s aesthetic and functional requirements of privacy, daylight and community.

While the details of the active systems have not yet been finalized, the project anticipates using relatively well-understood technologies such as solar hot water heaters, rainwater capture/reuse and heat pumps. These, combined with the passive design aspects of the project, mean it should achieve close to (if not completely) net-zero energy-use on an annual basis.

**passive design meets privacy requirements**

The large, south-facing windows of the new units behind the heritage structures will look at the north side of the laneway housing, where passive design dictates few windows. Similarly, the south-facing windows on the laneway house will be looking on to the laneway and impressive southern views of the city, rather than into their neighbour’s windows.

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**energuide**

The EnerGuide rating system is an initiative of Natural Resources Canada that rates appliances, buildings, vehicles and other energy consuming devices.

For homes, an EnerGuide rating shows a standard measure of its energy performance. It shows the owner (and future buyers) exactly how energy efficient your home is. The rating is calculated based on standard operation assumptions so that you can compare the energy performance of one house against another.

The home’s energy efficiency level is rated on a scale of 0 to 100. A rating of 0 represents a home with major air leakage, no insulation and extremely high energy consumption. A rating of 100 represents a house that is airtight, wellinsulated, sufficiently ventilated and requires no purchased energy on an annual basis.

- New house built to building code standards: 65-72
- New house with some energy-efficiency improvements: 73-79
- Energy-efficient new house: 80-90
- House requiring little or no purchased energy: 91-100

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**built green**

Built Green is an industry driven voluntary program that promotes "green" building practices to reduce the impact that building has on the environment. It benefits the homebuyer, the community and the environment and is an opportunity for everyone to choose a "green" future.
the amount of energy produced by the project. These technologies and design strategies can come with an ‘innovators’ premium; in terms of initial construction premiums, the projected costs are not more than 10-12% above ‘normal’ costs for a similar type of project. However, higher capital costs will mean that the project’s operational costs -- the annual cost to live in the project -- will be much reduced. Additionally, the owners have identified a potential demand in the market for energy efficient housing and indeed will be living in the complex themselves!

**proposed utility systems**