

4

case  
study

# 666 + 662 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

“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.

## building at a glance

building name	Union Street ECOheritage
location	666 + 662 Union St.
size	587 m <sup>2</sup> (6322 sf)
original building	1892
rehabilitation	2010 - 2011
original use	single family residential
new use	multi-family residential
distinctions	(targeting): LEED: NC Platinum Built Green: Platinum Energuide 90+



## building team

owner	Dick Hellofs Karli Gillespie
architect	ShapeArchitecture

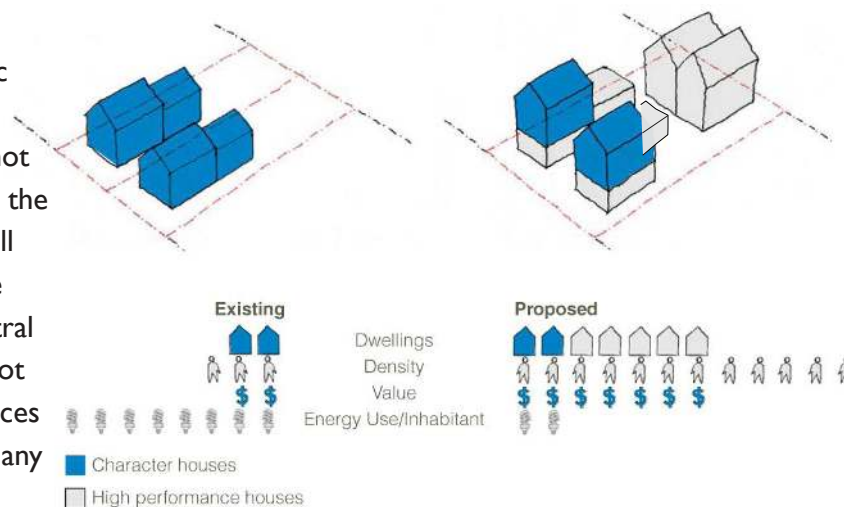


When Karli and Dick moved to Strathcona five years ago, they came to understand the neighbourhood's strengths and weaknesses: centrally located and close to downtown with a strong sense of community and a great heritage feel, yet also very unaffordable for ordinary people looking to buy or rent a home. 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





# history



Strathcona redevelopment, circa 1960s



existing buildings from laneway



unrestored 'slum' house at East Georgia and Glen, circa 1980

In 1892, carpenter Wilhelm Twambley 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."<sup>1</sup> 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. Fortunately, residents fought these actions, leaving

<sup>1</sup> John Atkin, *Strathcona: Vancouver's First Neighbourhood* [1994]

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.

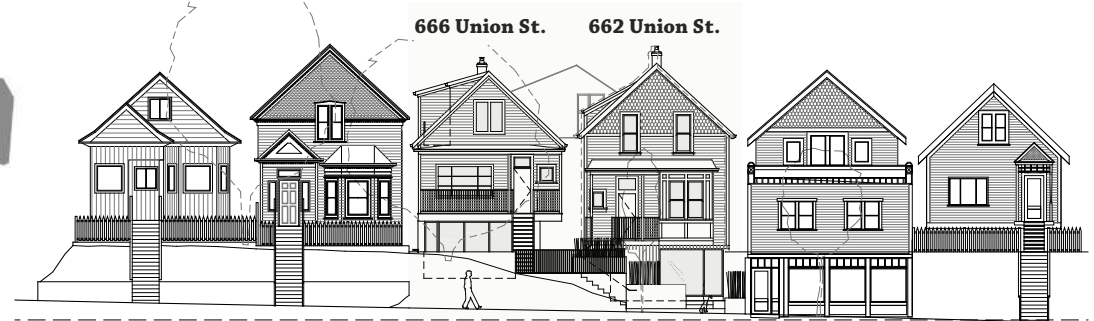
The Union Street Eco-Heritage project proposes to maintain these character defining features, while providing a new reference point in the history of the neighbourhood. The project will reflect today's aesthetic and social priorities and in turn transmit them to future generations of Strathcona residents.



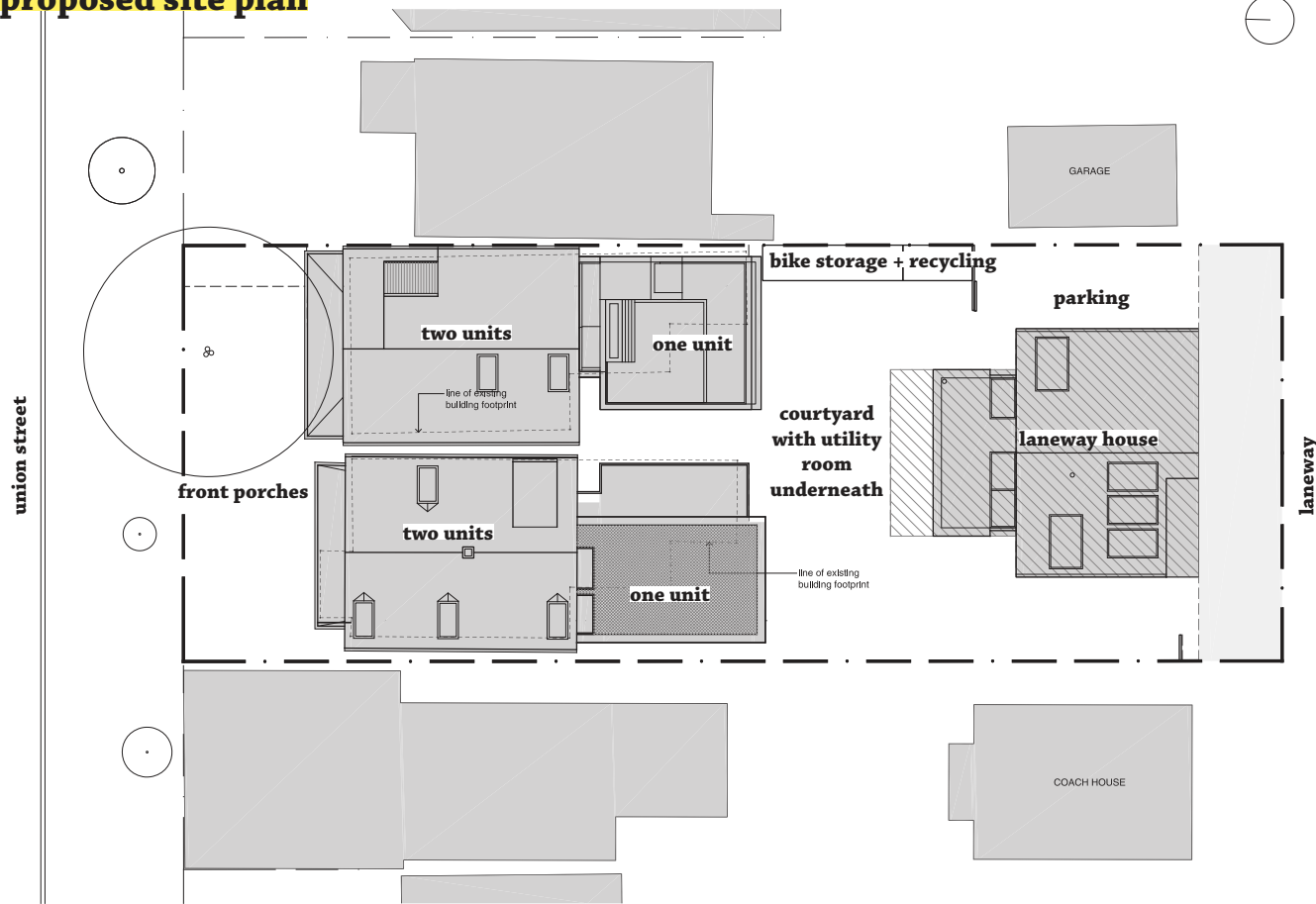


sketch of proposed redevelopment from laneway

## proposed streetscape elevations

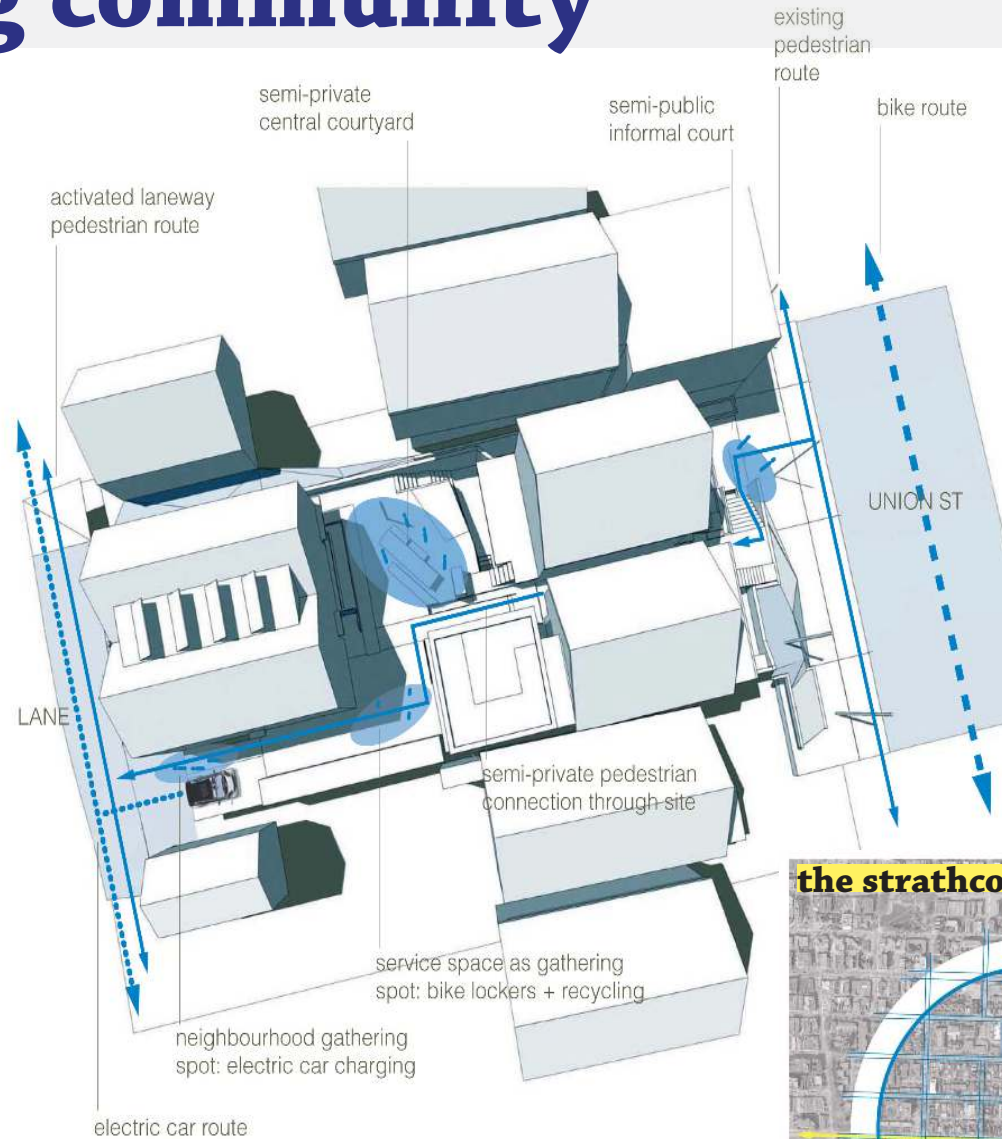


## proposed site plan



# prioritizing community

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.

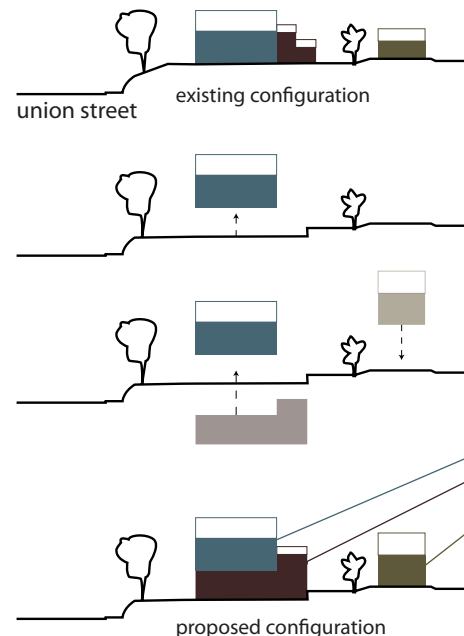
## the strathcona neighbourhood





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 existing structure and lifting/excavating underneath.

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

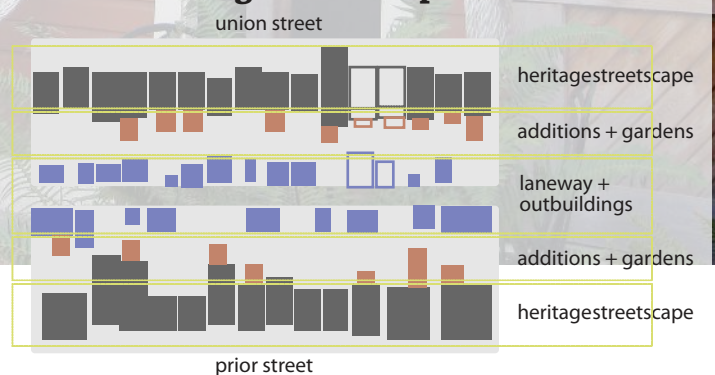
Heritage design is about taking the past and extending it into the future. The social artifacts of building and neighbourhood are the inheritance of our past and are not just architecture. They are the elements that make up the social fabric of a city. Shape's work with the Union Street ECOheritage project 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

## strathcona neighbourhood patterns





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.



proposed streetfront elevations

### 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.



proposed laneway elevation



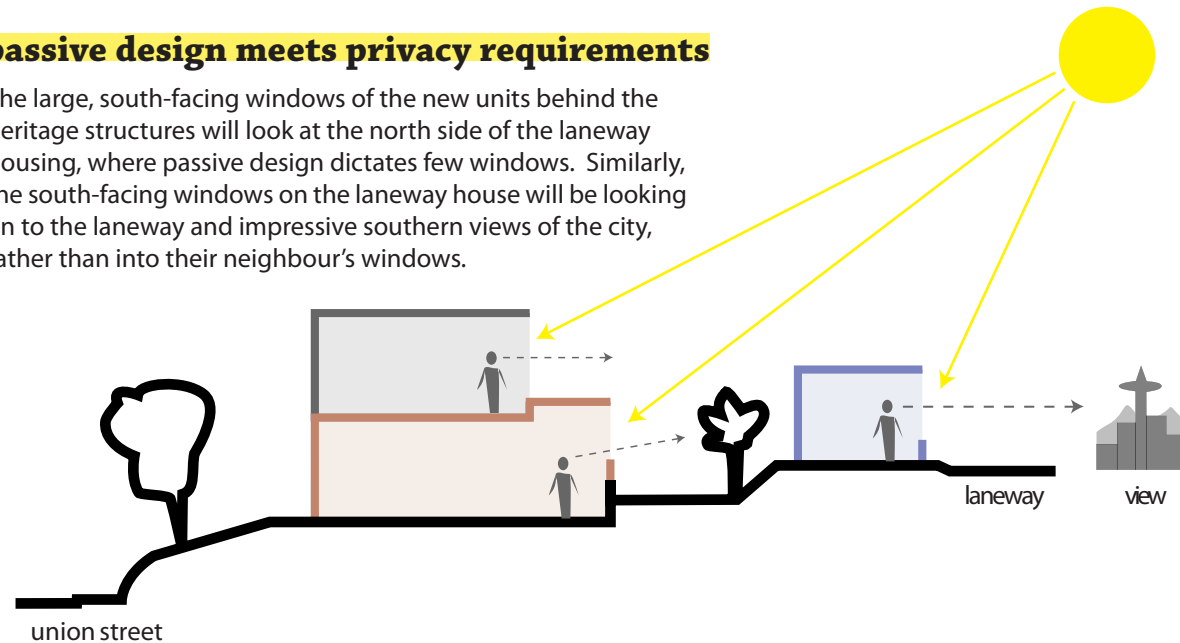
# balancing high performance + character

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. This means that the total amount of energy consumed in a year will not exceed

## 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.



## energuide

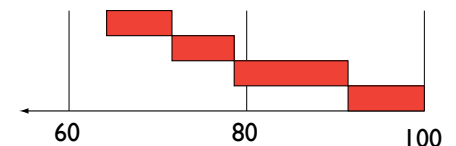
<http://oee.nrcan.gc.ca/energuide/home.cfm>

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, well insulated, 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

## built green

[builtgreencanada.ca](http://builtgreencanada.ca)

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

