

CARLETON COTTAGE

NORTH OKANAGAN HOUSING DESIGN COMPETITION

SECONDARY DWELLING UNIT BUILDING PLANS // 930 SQ.FT.
EST. CONSTRUCTION COST - \$240/SQ.FT.
DESIGNED TO SUIT THE BCBC (MARCH, 2023)

BUILDING SIZE: 36' 8" X 28' 8", ROOF HEIGHT OF 14' 3"

BUILDING SPECIFICATIONS: 2 BEDROOMS, 4PC. BATH-ROOM, EAT-IN KITCHEN W/DOUBLE SINK, VINYL PLANK FLOORS, IN-UNIT WASHER/DRYER, TANKLESS HOT WATER, DUCTLESS HEAT PUMP AND HRV, NATURAL CROSS FLOW VENTILATION, SMART UTILITY CONTROL, SMART LED LIGHTING, LOTS OF STORAGE, SPACIOUS LIVING ROOM, PRIVACY BLINDS.

CONSTRUCTION SPECIFICATIONS: SLAB ON GRADE FOUNDATION, CROSS-LAMINATED TIMBER PREFAB EXTERIOR WALLS, WOOD FRAME INTERIOR WALLS, 4/12 OFFSET/FINK TRUSS ROOF, ISOLATED INTERIOR PLUMBING SYSTEM, UNENCLOSED PORCH, STRIP SHINGLE ROOF.

ADDITIONAL ADD-ONS: CARPORT, CENTRAL HVAC SYSTEM, SOLAR PANEL INSTALL, ISOALTED SEPTIC TANK, PREMIUM WOOD SIDING.



Carleton Cottage - Pitch

Introducing Carleton Cottage, the ideal carriage house designed with contemporary living needs in mind. This stand-alone home offers modern and open living spaces, making it perfect for accommodating guests, family members, or rental income. With 930 square feet of livable space, Carleton Cottage maximizes every inch to provide both functionality and style.

The open floor plan connects the living room, dining area, and kitchen, creating a warm and inviting ambiance that's perfect for entertaining guests or spending time with family. With flexible furniture layouts and ample interchangeable storage options, the unit can be customized and styled to meet your preferences. Carleton Cottage boasts modern technology with its main structural system made of Cross Laminated Timber, utilizing locally sourced lumber from within British Columbia. The walls are prefabricated and shipped to the site, resulting in reduced construction time. The exposed timber adds warmth to the interior and exemplifies natural light.

The design includes two spacious bedrooms, each with plenty of storage and natural light. The master bedroom features a larger footprint and a beautiful front-facing window, while the second bedroom can also serve as a home office, den, or gym if preferred. The forefront of the unit features a covered outdoor porch, providing private outdoor spaces for both residents on the property. The overall design allows for various site configurations, orientations, and site-specific features. The secondary entrance and flat side wall can easily accommodate future additions, such as a driveway or carport.

Carleton Cottage is fully independent from the primary residence, providing both privacy and convenience. It is equipped with in-unit laundry, ample storage space for appliances, and a modern and spacious kitchen with a full-height fridge/freezer, dishwasher, double sink, and oven range. With its innovative contemporary design, Carleton Cottage offers a new level of affordable living. The bungalow-style layout is designed for ease of navigation, with a spacious open floor plan that meets all your needs. The carefully designed layout offers comfort and functionality, making it the perfect addition to any property.

Overall, Carleton Cottage provides a unique living experience that's perfect for those looking to maximize their space while enjoying modern living. Its customizable and functional design, coupled with its natural timber accents and modern technology, makes it a must-have for anyone looking for a modern and affordable living solution.

Carleton Cottage

Technical Description

The technical specifications of this house are impressive in showcasing the many benefits of using cross-laminated timber (CLT) and smart mechanical systems in small-scale residential construction. This house is 930 square feet, stands 14'3" tall and features two bedrooms, one bathroom, a spacious living area, and a full-sized kitchen. It also has in-unit laundry, a tankless water heater, and a ductless HRV and mini-split with a heat pump to optimize utility consumption and comfort year-round.

CLT is a relatively new technology that has been gaining popularity in the construction industry due to its many benefits. It is made by laminating layers of wood at right angles to each other, forming itself into a strong, stable, and durable panel. The prefabricated nature of the material makes it optimal for small-scale residential construction as it significantly reduces construction time, resulting in lower labour costs and minimal intrusiveness. Once delivered, the prefabricated panels can be erected in as little as one day. This makes it an excellent option for those looking for an affordable and efficient way to build a new home and means it is easily replicable. CLT has excellent thermal efficiency due to its airtightness, which reduces energy consumption and lowers heating and cooling costs. This makes it an eco-friendly option that significantly reduces a home's carbon footprint. Additionally, using locally sourced timber can make CLT a sustainable option and support the local economy.

This house's technical specifications highlight its optimized functionality and design with users and operations in mind. For example, a smart ductless HRV system is designed to provide fresh air to the house while expelling stale air, and when paired with a smart control 24k BTU mini-split heat pump, the temperature, humidity and Co2 levels can be constantly monitored and adjusted based on current local weather and temperatures. This system helps to maintain optimal air quality and reduces the risk of mould and other indoor air pollutants. The washer/dryer combo unit is another example of energy-efficient technology that reduces water and electrical consumption, contributing to a sustainable lifestyle. Mounted above the laundry the 240v tankless water heater is another feature that contributes to the house's mechanical and operational efficiency. This system heats water on demand, which reduces energy costs and is sized appropriately for smaller homes.

The house's exterior features a wood accent wall, which adds a natural element to the building's design. The natural raw CLT face on the interior further enhances the natural aesthetic while providing excellent acoustic properties. The bedrooms have built-in closets as well as plenty of storage available throughout the house. The kitchen contains all full-sized standard appliances and room for a small dining table if desired.

The house's large windows provide plenty of natural light, regardless of orientation, and the side exit allows for parking access or a future carport addition. The house sits on a slab-on-grade foundation that can be modified to fit the building site, and the offset truss provides 3/12 pitch cathedral ceilings in the primary living space, allowing for a flat roof in the unenclosed porch.

Evaluation Criteria

Carleton Cottage is designed to be high-quality, attractive, and practical. Its use of cross-laminated timber (CLT) construction provides a unique and modern aesthetic while also being compatible with the form and structure of principal buildings and neighbourhood housing stock/types. The natural wood finish on the interior and the wood accent wall on the exterior add to the home's visual appeal. The internal layout is suitable for small families and individuals, with built-in closets and plenty of storage available. The large windows provide plenty of natural light, and the side exit allows for parking access or future carport addition.

The house has exceptional street appeal and affords privacy to both occupants and adjacent neighbours through limited side windows and privacy screens where necessary. The design can be easily replicated for multiple houses of the same design using prefab CLT panels to further reduce construction costs. Users will benefit from house-like features such as a full-sized kitchen, cathedral ceilings, built-in closets, and a fully equipped 4-piece bathroom.

Regarding affordability, the house's cost is approximately \$240 per square foot or a total cost of ~\$223,200, making it an affordable option for those looking to build a new home or add a secondary dwelling unit to their existing acreage. The use of CLT in construction also reduces construction time and therefore labour costs and reduces delays in the building construction process. The ductless HRV system, in-unit laundry, tankless water heater, and ductless mini-split heat pump make the house more energy-efficient, and reduce utility costs while maintaining breathability and comfort year-round at a low price. For a cost breakdown estimate, see the table below (Table.1)

In terms of flexibility and longevity, the design can be easily modified to fit different building sites and lot configurations. Its use of a slab-on-grade foundation protects against shifting and premature wear on the structure of the building. The CLT construction makes it a sustainable and durable option which improves air tightness and rigidity throughout the entire shell and the building's life cycle.

Lastly, the house's use of CLT construction is already a sustainable option. The house's mentioned mechanical systems make it more energy-efficient and work to reduce operational and maintenance costs post-construction. There is a potential for other sustainability features, such as solar installations, to further reduce the house's environmental impact and improve performance.

Overall, this house meets the criteria outlined in the design contest by being a high-quality, attractive, practical, affordable, flexible, and sustainable option for those looking to build a new home. It boasts an excellent example of how CLT can be used in small-scale residential construction while balancing the design, appeal, and functionality of practical living spaces. Its technical specifications highlight the many benefits, including its quick build time, excellent thermal efficiency, and natural aesthetic. Its affordability makes it an attractive option for those looking to build a new home.

Table 1 - Estimated Cost Breakdown

Construction Costs		
Item	Cost Breakdown	EST. Cost
Land Preparation		XXX
Foundation		\$ 8,000.00
Wood Framing, Partitions, etc.		
	CLT Framework (Exterior)	\$ 70,000.00
	Wood Framing (Interior)	\$ 15,000.00
	Roof Framing (Truss/Rafter)	\$ 10,000.00
Exterior Finishes		
	Rigid insulation	\$ 2,000.00
	Weatherproofing	\$ 1,500.00
	Siding	\$ 4,000.00
Roofing, Drains, Gutters, Flashing		\$ 9,700.00
Interior Finish and Trim		
	Finish Flooring, Trim	\$ 6,000.00
	Door Frames and Leafs	\$ 3,500.00
	Glass, Windows, Glazing	\$ 6,500.00
	Sheetrock, Mudding, Taping	\$ 3,000.00
	Ceiling Soundproofing and Insulation	\$ 1,500.00
	Finish Hardware	\$ 500.00
	Painting and Decorating	\$ 3,000.00
	Kitchen Build Out	\$ 15,000.00
	W/C Build Out	\$ 5,000.00
Exterior Trim		
	Concrete Porch	\$ 1,000.00
Service Work		
General Contracting		\$ 30,000.00
Electrical		\$ 12,000.00
HVAC		\$ 8,000.00
Plumbing and Sewage		\$ 8,000.00
	Total Build Cost (HST Not Included)	\$ 223,200.00
		\$240/Sq.Ft.