

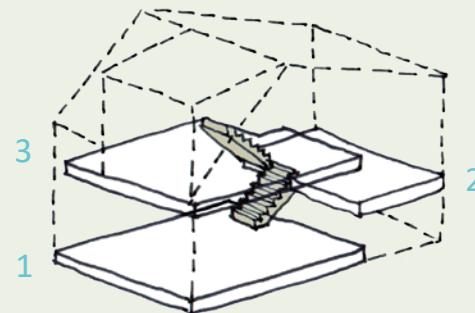
Our final submission for the laneway competition is formatted as a booklet. The booklet would be available for distribution at City Hall to people interested in building this laneway house, and is meant to give them a thorough and accessible overview of the design. The model featured here could also be kept at City Hall for interested property owners to view in person.









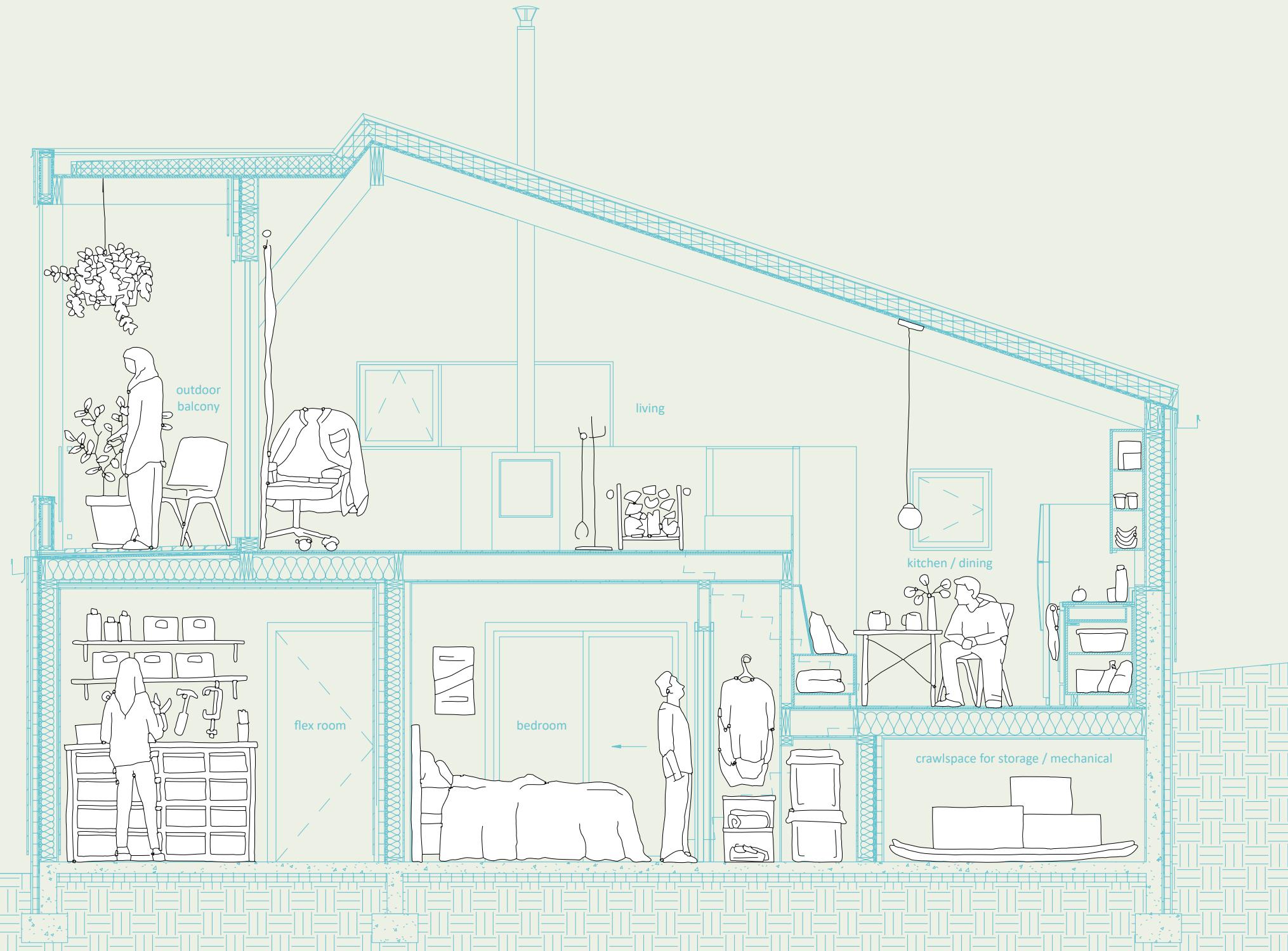


SAY HELLO TO THE KOOTENAY THREE-STEP

Living small doesn't mean you have to give up everything that's great about living in Nelson. The key is flexibility. This laneway house was designed with maximum flexibility in mind. It will feel at home on virtually any site, for residents with any lifestyle or taste.

The secret behind this flexibility is the stepping floor plan that gives this laneway house its name: The Kootenay Three-Step. By placing the kitchen on a half level between the other two floors, this laneway house sits comfortably on a variety of Nelson's sloping sites. The design can be mirrored or rotated depending on which way your property slopes, and works just as well on perfectly flat sites. (For more information on these options, see pages ii-v in the appendix)

Because of the reduced scale of a laneway house, the spaces inside can sometimes feel claustrophobic. Not in the Kootenay Three-Step. The stepped plan, combined with vaulted ceilings, creates spaces that feel connected – with higher ceilings and more natural light. The stepped plan has other benefits as well. Under the kitchen floor is a generous crawl space that is a perfect location for gear storage or mechanical equipment, and the majority of interior spaces have direct access outside.



section

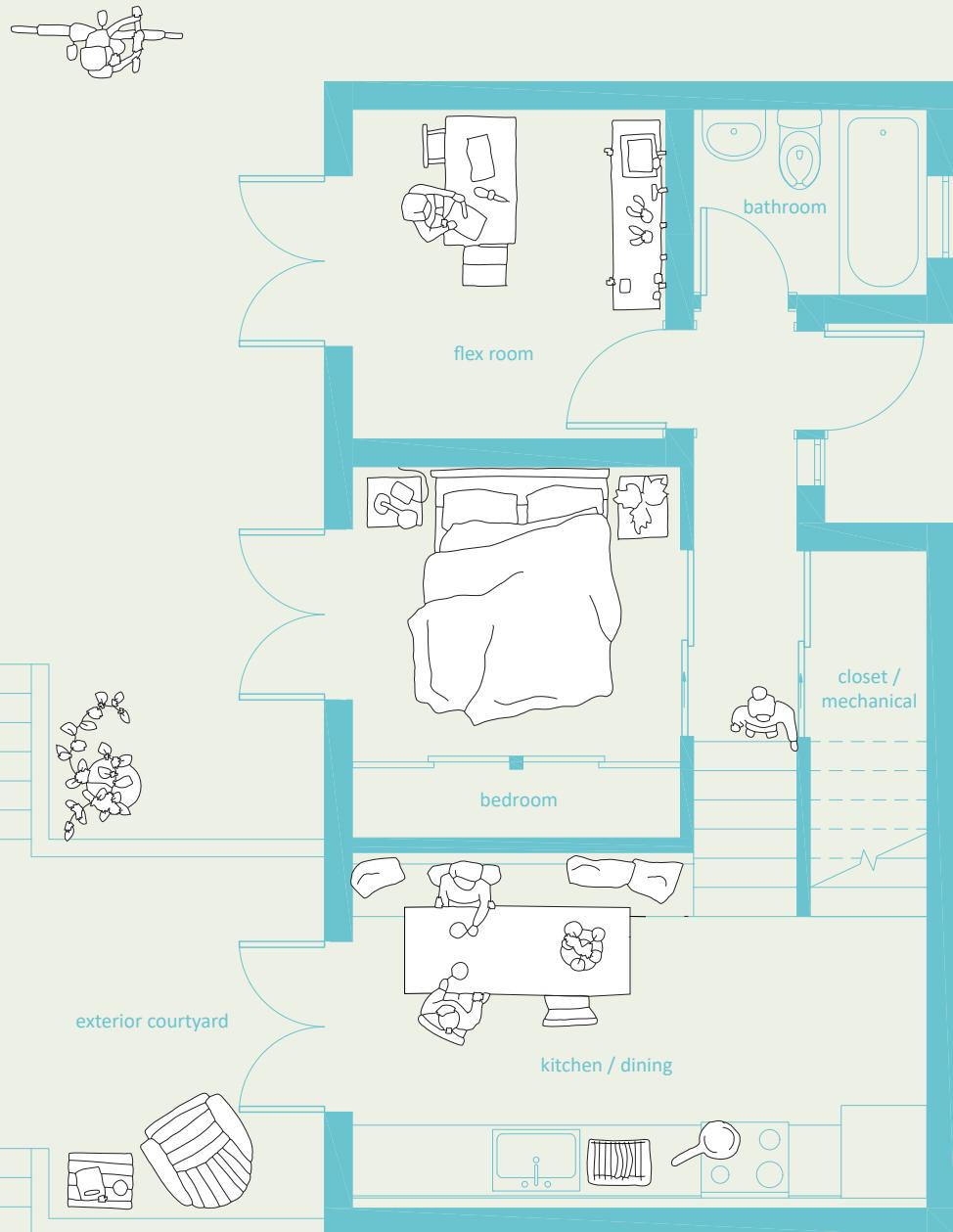
8

0 1 2 4 ft
9



Flex room

The ground floor has access to the exterior on two sides. On one side is a door that can be used as a main entry, depending on the orientation of the laneway house and its landscaping. On the other side is a bedroom and a flex room. This flex room can be configured for a variety of purposes: It could be partially finished and used for outdoor equipment storage, a partially covered patio, workshop, or mudroom; or it could be fully finished and used as a second bedroom, guest room or home office.



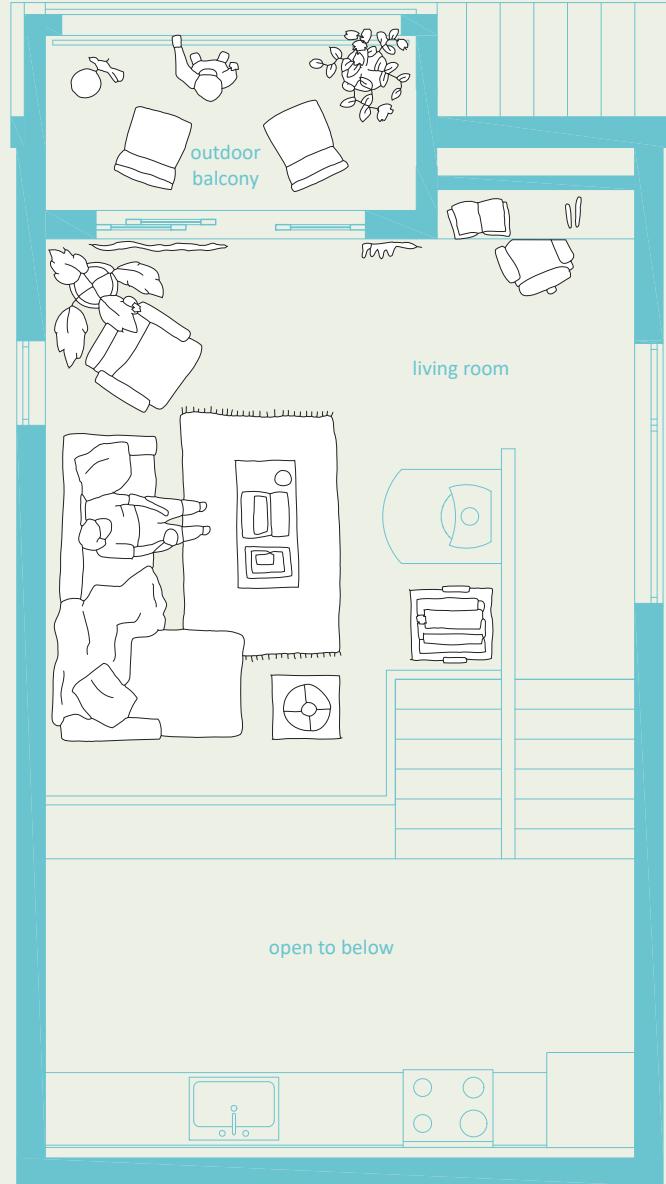
ground floor plan

*see page viii in the appendix for area calculations



Living room from exterior balcony

Between the ground and upper floors is the combined kitchen and dining area, also with direct access to an outdoor dining and barbecue area. The upper floor features a living room with generous ceilings and a fireplace, space for a small desk and/or built-in storage, and a covered outdoor deck which, on most sites, should have a beautiful view of the mountains and lake.



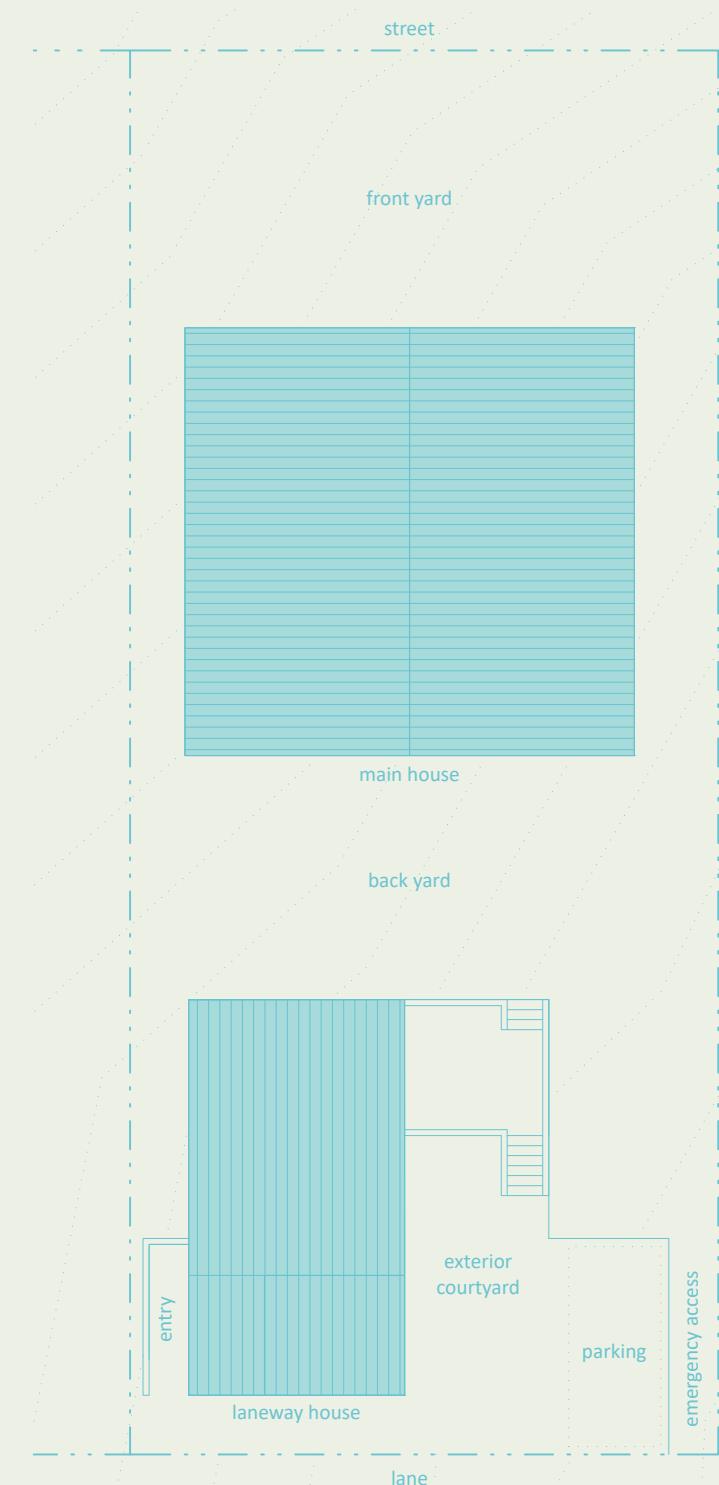
upper floor plan

*see page viii in the appendix for area calculations



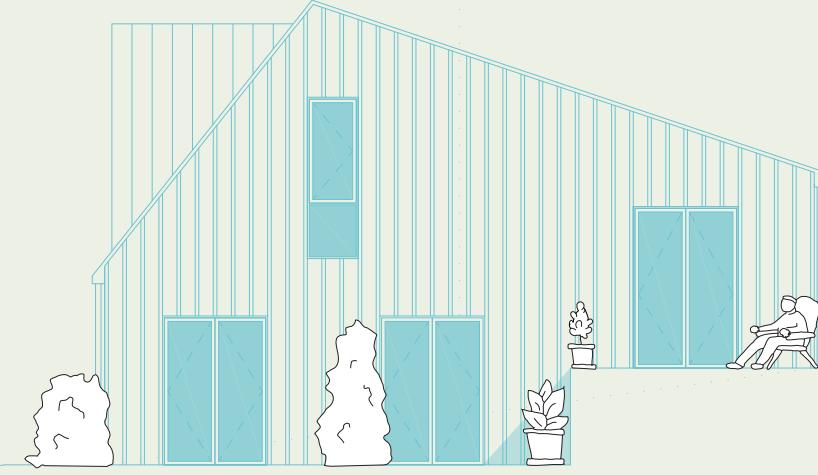
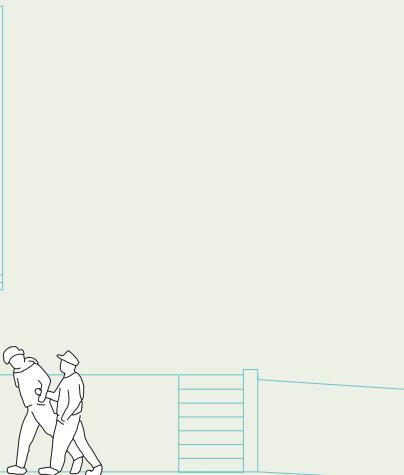
The Kootenay Three-Step is designed to be a great neighbour. On the side facing the main house, the roof line is low and there are no windows, so privacy won't be a problem and the building won't cast large shadows. The largest windows and doors have been kept to one side of the laneway house where they can be screened with landscaping, if necessary. Windows located higher up are smaller or, in the case of the covered deck, screened completely on the sides for privacy.

The familiar pitched roof form fits well in any residential neighbourhood, and can be finished off in a variety of materials and colours. The images in this booklet (and in the model) show painted fiber cement board and batten for the siding, and standing seam metal on the roof and the dormer of the covered deck on the upper floor. These materials meet the requirements of the Wildfire Development Permit zone.

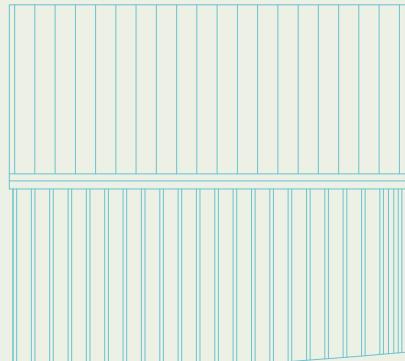




front elevation

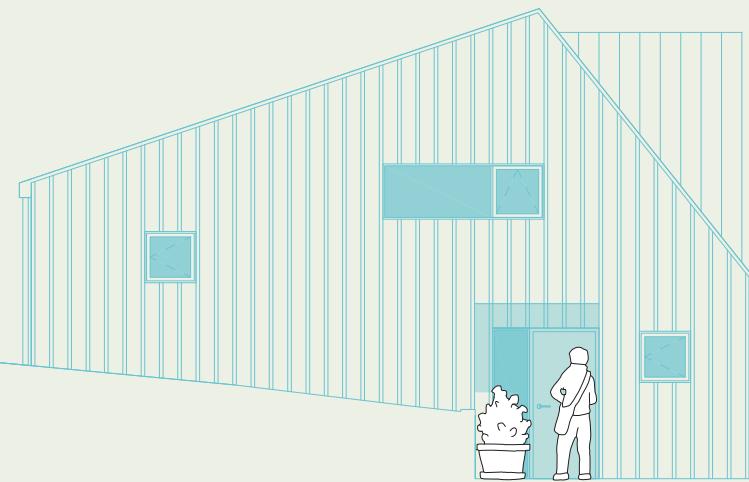


side elevation



back elevation

0 2 4 8 ft

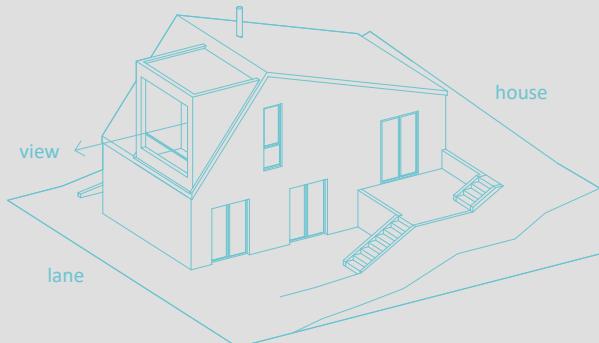


side elevation

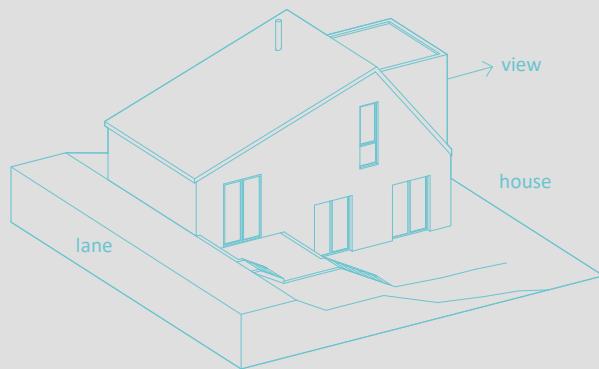
*see page viii in the appendix for height calculations

APPENDIX

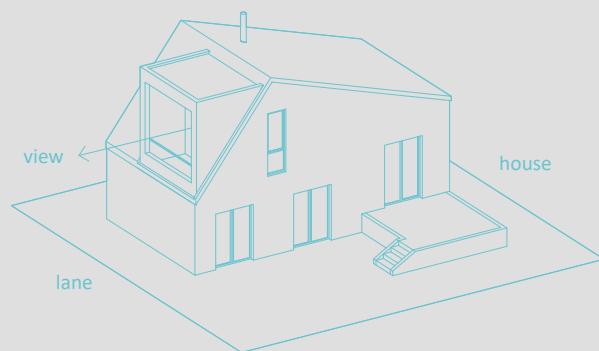
SLOPING SITE CONDITIONS



downward slope



upward slope

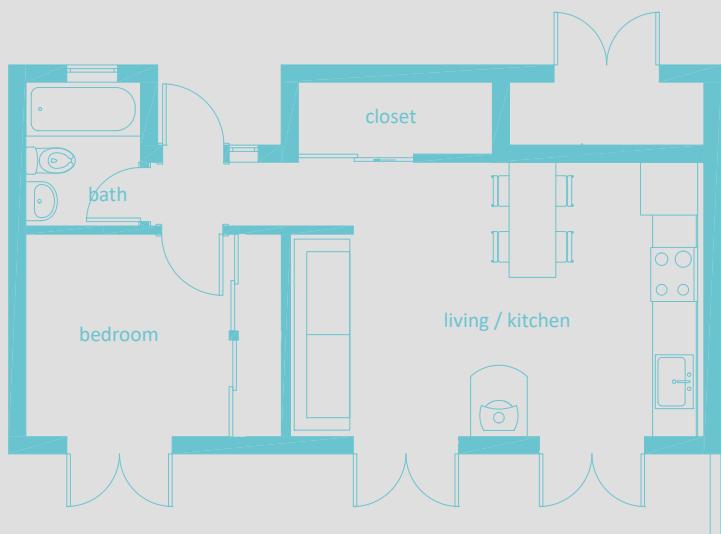


flat site



Because Nelson slopes down towards the lake, the Kootenay Three-Step nearly always provides scenic views, no matter its location on a site. It can be rotated, flipped or mirrored to accommodate most site slopes and other conditions with minimal changes to the design. The half step in the floor plan allows for mechanical and storage space underneath and can be raised or lowered as needed to match the adjacent grade. On flat sites, the stepped scheme still provides these benefits, plus a raised exterior deck to allow for increased privacy and additional under-house storage.

VARIATIONS



upper floor



lower floor

The Kootneay Three-Step can be altered to accommodate a variety of owner needs. Pictured above is a one-storey version that retains many of the characteristics of the original. The storage loft over the bedroom has a porthole window and could easily be used as a sleeping loft for guests. To the right is a variation of the original that shows the flex room converted to a full second bedroom.

one level option

two bedroom option

ENERGY EFFICIENCY

The Kootenay Three-Step is designed to meet today's building code requirements for energy efficiency and can easily be modified for even greater efficiency. The following tables detail two options for meeting Step 3 of the BC Step Code, but these are recommendations only. Additional options (including renewable energy generation) could achieve even greater levels of environmentally sustainability.

TABLE 1 - Step Code Metrics (for reference only)

		Step Code Metric	Step 1	Step 2	Step 3	Step 4	Step 5
Mechanical	% better than reference house	0%	10%	20%	40%	No target (report score)	
	Mechanical Energy Usage Intensity (MEUI)	No target (report score)	158 kWh/m ² ·year	143 kWh/m ² ·year	118 kWh/m ² ·year	88 kWh/m ² ·year	
Envelope	Air Tightness	ACH @ 50 Pa	No target	3.0 ACH @ 50 Pa	2.5 ACH @ 50 Pa	1.5 ACH @ 50 Pa	1.0 ACH @ 50 Pa
	Thermal Energy Demand Intensity (TEDI)	No target (report score)	52 kWh/m ² ·year	45 kWh/m ² ·year	35 kWh/m ² ·year	22 kWh/m ² ·year	

TABLE 2 - Projected Step Code Metrics with Design Options

		Projections	Option 1	Option 2
Ratings	Projected Step Code Level		Step 3	Step 3
	Projected EnerGuide Score		45 GJ/year	49 GJ/year
Mechanical	Reference EnerGuide Score		63 GJ/year	59 GJ/year
	% Better than Reference House		47.89%	30.57%
Envelope	Mechanical Energy Usage Intensity (MEUI)		75 kWh/m ² ·year	90 kWh/m ² ·year
	Air Tightness (ACH @ 50 Pa)		2.5 ACH @ 50 Pa	2.5 ACH @ 50 Pa
Envelope	Thermal Energy Demand Intensity (TEDI)		45 kWh/m ² ·year	44 kWh/m ² ·year

TABLE 3 - Construction Details with Design Options

Projections		Option 1	Option 2
Envelope Components	Slab Insulation	Under Slab: R-15 rigid foam	Same as Option 1
	Concrete Wall	8" Concrete, 2x4 @ 16" O/C R-14 Batt	8" Concrete, 2" XPS, 2x4 @ 16" O/C R-14 Batt
	Above Grade Walls	2" Mineral Wool, 2x6 @ 16" O/C R-22 Batt	Same as Option 1
	Headers/ box joists	2" Mineral Wool, R-22 Batt	Same as Option 1
	Exposed Floors	2x10 @ 16" O/C R-28 Batt	Same as Option 1
	Flat and Vaulted Ceilings	Flat deck: 2x10 @ 16" O/C R-28 Batt Vault: 6" ISO, Exposed Framing	Same as Option 1
	Air Barrier	6mm poly vapour barrier	Same as Option 1
	Vapour Barrier	Poly vapour barrier	Same as Option 1
	Windows	USI 1.4, SHGC 0.25 Patio Sliding doors: USI 1.4, SHGC 0.3	Same as Option 1
	Doors	Insulated fiberglass doors; front door - solid wood	Same as Option 1
Mechanical Components	Fenestration and Door to Wall Ratio	18.61%	Same as Option 1
	Air Tightness	2.5 ACH @ 50 Pa	Same as Option 1
	Ventilation	HRV with 65% SRE at 0 degrees C @ 30 cfm min.	Same as Option 1
	Heating System	Ductless mini-split air source heat pump 8.5 HSPF 16 SEER	Electric Baseboard
	Air conditioning or heat pump	Air source heat pump	N/A
	Hot Water	1 electric conserver tank (40 US gal.)	1 natural gas, instantaneous water heater 0.96 EF

BUILDING DATA

The data below are based on typical property characteristics and will work for most sites in Nelson. However, please note that the data will need to be confirmed and may require adjustments depending on the specifics of your property.

SITE DATA

Assumed Site Dimensions: 122.05 ft x 50.20 ft (37.2 m x 15.3 m)
Assumed Site Area: 6,127 sf (570 m²)

AREA CALCULATIONS

The Kootenay Three-Step (1 bed + flex/ 2 bed)

Upper Floor	275.1 sf	25.56 m ²			
Kitchen Floor	183.6 sf	17.06 m ²			
Ground Floor	389.1 sf	36.15 m ²			
Total Area	847.8 sf	78.77 m²	Max. Allowable Area	958 sf	89 m²
Footprint Area	593.6 sf	55.15 m²	Max. Allowable Footprint	699 sf	65 m²

AREA CALCULATIONS

The Kootenay Three-Step - Variation (1 Bed/ 1 Storey Alternative)

Ground Floor	571.4 sf	53.09 m ²			
Total Area	571.4 sf	53.09 m²	Max. Allowable Area	958 sf	89 m²
Footprint Area	593.6 sf	55.15 m²	Max. Allowable Footprint	861 sf	80 m²

HEIGHT CALCULATION

Grade Elevation Above Base		
Corner A	0 ft	0 m
Corner B	6.72 ft	2.05 m
Corner C	6.72 ft	2.05 m
Corner D	0 ft	0 m
Average Grade	3.36 ft	1.02 m
Proposed Height	19.03 ft	5.8 m
		Max. Allowed Height 19.03 ft 5.8 m

PROFORMA

The table below gives an analysis of the construction costs and possible revenue available from this laneway house design. It compares a custom laneway house design (on the left) with the Kootenay Three-Step and its one-storey alternative (on the right). As the calculations demonstrate, the Kootenay Three-Step has the potential to generate more profit, and therefore higher rates of return, than comparable custom builds.

	Custom LWH	Kootenay Three-Step	
Description	2 BED	1 BED + FLEX/ TWO BED	1 BED/ 1 STOREY ALT.
Laneway House Size	700 sf	65 m ²	850 sf
Mothly Rent	\$ 1,400	\$ 1,500	53.9 m ²
Operating Costs (property tax, maintenance, etc.)	30%	30%	30%
Net Operating Income (per year)	\$ 11,760	\$ 12,600	\$ 10,080
Capitalization Rate (annual ROI)	3%	3%	3%
Laneway House Value (income/ROI)	\$ 392,000	\$ 420,000	\$ 336,000
Soft Costs			
Design Fees	\$ 8,000	\$ 11	\$ 0
Municipal Fees	\$ 5,000	\$ 7	\$ 1,000
Other Soft	\$ 3,000	\$ 4	\$ 0
Hard Costs			
Site Work	\$ 26,000	\$ 37	\$ 27,000
Foundation	\$ 21,000	\$ 30	\$ 22,000
Superstructure	\$ 145,000	\$ 207	\$ 160,000
Landscape	\$ 11,000	\$ 16	\$ 11,000
Total Cost for Laneway House	\$ 219,000	\$ 313	\$ 221,000
Profit (value minus cost)	\$ 173,000	79%	\$ 199,000
		90%	\$ 145,000
Existing House and Land Value	\$ 350,000	\$ 20,000	\$ 350,000
Return as % of Existing Real Estate Value	49%	76%	57%
		\$ 350,000	\$ 350,000
		41%	41%