Resilience and sustainability considerations for new residential construction

REGIONAL DISTRICT CENTRAL KOOTENAY

rdck.ca/sustainability

Resilience and sustainability considerations for new residential construction

This list of suggestions can help you plan, design and build a sustainable and resilient home. The ideal time to consider sustainability is well before you begin construction so you can choose options that offer long-term benefits in terms of energy efficiency, wildfire resistance, water conservation and more. Making these choices now can help you avoid costly retrofits later on. Now is also the time to consider ways to minimize construction waste and carbon pollution.

Some of the following recommendations are cost neutral, such as planting deciduous trees instead of conifers. Other recommendations may come with a higher cost now but can help you save on your utility bills over the long term.

The RDCK encourages residents to use renewable energy and energy-efficient technology in their homes. To view the digital version of this checklist with active hyperlinks and to learn more about the RDCK's sustainability efforts, visit rdck.ca/SustainabilityChecklist or rdck.ca/energy.

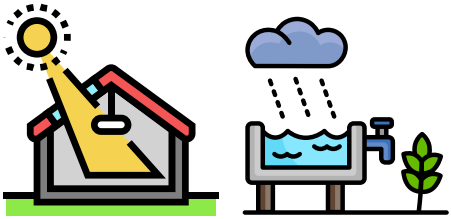
PLANNING PHASE

Overall

- Consider **renovating** an existing home rather than building new.
- Consider **building smaller** to decrease costs, waste and emissions.
- **Minimize site disturbance** in siting your home.
- Think about the **house as a system** when considering energy efficiency.
- **Plan for longevity** of your home, consider future uses, and build in flexibility (such as plumbing rough-ins and fire separations).
- Consider building for **higher density** (such as creating secondary suites or multi-family dwellings).
- Check if your property may contain an archaeological site and understand your responsibilities under the Heritage Conservation Act. Learn more here.

Energy efficiency and reducing emissions

- **Hire an Energy Advisor** to meet the requirements of the Energy Step Code and Carbon Step Code.
- Consider sizing your electrical system for a current or future zero-carbon building.
- **Use natural features to choose the building site** to be able to incorporate passive design elements, like optimizing solar orientation for passive solar gain.
- Consider using **Lifecycle Assessment** tools.
- Familiarize yourself with **green labels**, including Passive Haus, LEED for Homes, ENERGY STAR® for New Homes and BuiltGreen.
- Learn about **embodied energy** in construction materials.
- Look into potential **energy-efficiency rebates** and **reduced insurance products**: Betterhomesbc.ca, Fortis BC rebates, BC Hydro rebates, Canada Mortgage and Housing insurance.
- Consider **supplemental solar power and backup options**—such as batteries or generators—in addition to the main power grid to improve resilience during extreme weather.
- Ensure your new home includes a **designated cooled or air-conditioned room**, as required by the BC Building Code for occupant safety during extreme heat.



FireSmart

- Request a **FREE FireSmart assessment** to receive recommendations. The assessment will look at fuel type, topography, landscaping considerations and building materials. Email firesmart@rdck.bc.ca or call 250-352-1539.

WaterSmart

- Consider **flood management and erosion control** in site selection.
- Plan to **retain deciduous trees**.
- Plan to **retain coniferous trees** that align with your FireSmart assessment.
- Plan for **climate ready roof** – rain water harvesting.

Waste management

- Plan for **disposing landscaping materials** at RDCK facilities.
- When your home reaches the end of its life, consider **low-carbon deconstruction**—such as salvaging wood, fixtures, and brick for reuse—to reduce waste and carbon pollution; learn more at nelson.ca/Low-Carbon-Buildings.

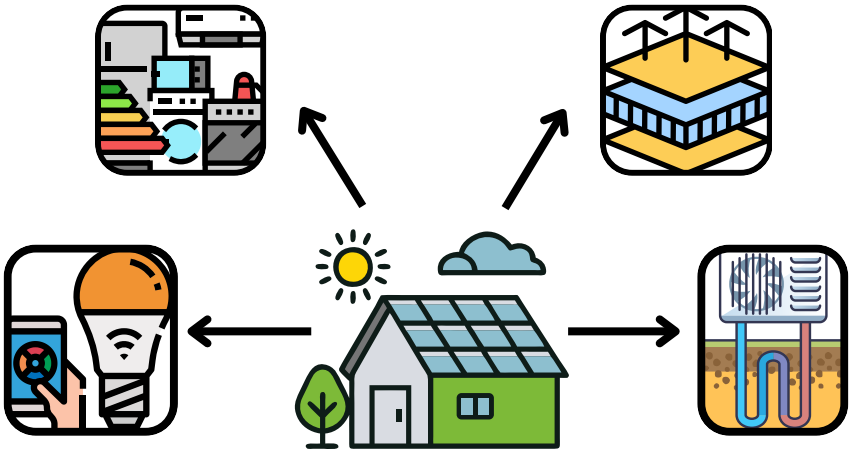
DESIGN PHASE

Overall

- Consider asking your contractor to use an **Integrated Design Process (IDP).**

Energy efficiency

- Check out energy efficiency case studies.
- Consider installing a **solar system** or preparing your home for a future solar retrofit.
- Choose **high-efficient ENERGY STAR® windows, doors and appliances**.
- Work with your builder and Energy Advisor to identify options to increase energy efficiency in your home, including:
  - Optimize insulation volumes under roofs, in walls and below floors.
  - Optimally size and position windows.
  - Choose high-efficiency space and water heating systems.
- Think about including **programmable controls** and controls that can be accessed remotely online for your space heating/cooling and lighting systems.
- Look into **heat recovery from drain water**.
- **Review ventilation measures** with your HVAC contractor to ensure they are consistent with the number of potential occupants and uses.
- To prevent freezing, reduce heat loss and improve energy efficiency.
  - **Focus on exterior piping** and those in exterior walls, crawl spaces, attics and basements.
  - **Insulate hot water pipes**, especially close to the hot water tank.

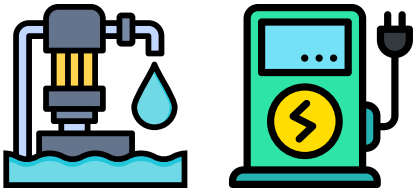


WaterSmart

- Consider **xeriscaping** when planning your landscaping.
- Think about setting up a **drip irrigation system** for vegetable and flower gardens.
- Think about where outdoor faucets or hose bibbs should be placed to **facilitate a drip system**.
- Maintain **permeable landscaping** and design run-off/erosion controls.
- Plan for **water-efficient plumbing fixtures** such as low-flow showerheads, faucets and toilets.
- Direct downspouts at least 2 metres away from foundations.
- Install a **water storage tank** or barrel to collect rainwater, with an overflow hose directing water 2 metres from the foundation.
- Install a **non-return or backflow preventer valve** in the sewer line at the base of your basement wall to stop sewer backflow into your home.
- Install and maintain a **sump pump**.

Air quality

- Consider installing a **high-quality air filtration system** that uses MERV13, HEPA, and/or activated charcoal to help reduce dust, pet dander and wildfire smoke.
- Choose **low off-gassing household products** that are easily cleaned of dust and dirt.



Transportation

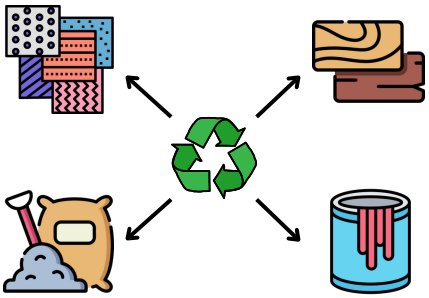
- Consider how to connect to transit, carpooling options and routes for walking, bicycling and other forms of active transportation.
- Plan to **install an electric vehicle (EV) charger** or a rough-in for a 'level 2' EV charger.
- **Design safe access** for walking and biking home and consider any lighting requirements.
- Plan for secure bicycle storage, safe storage for e-bike batteries and space for any carshare/bikeshare needs.

Waste management

- Consider **framing options to minimize waste**, such as order waste factor limit, detailed framing documents, detailed cut list and lumber order, framing efficiencies and off-site fabrication.
- Plan for **storing recyclables, compost and waste on site**.

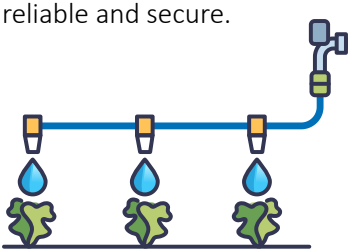
Sustainable materials

- Use **durable, sustainable, recycled materials** when possible.
- Choose **low-embodied carbon building materials** and site infrastructure.
  - Consider **mass timber and wood framing** over steel and concrete to decrease embodied energy.
  - **Minimize concrete emissions** by using a low-carbon concrete mix, not over-specifying strength or thicknesses, and considering alternate foundations, such as crawlspaces or screw piles.
  - Consider emissions for various insulation options.
  - Consider how to use **concrete and other structural elements** as finished products or surfaces.
- Think about **reducing carbon pollution** from shipping materials, manufacturing and transportation to the site.
- Choose **FireSmart materials** for the exterior of your home, decks and landscaping.
- Use products that have a long life and are low maintenance.
- Consider using wood with a SFI or FSC certification or equivalent.
- Use **non-toxic interior finishes,** including paints, adhesives and sealants that are low-VOC (volatile organic compounds).



Landscaping

- **Consider FireSmart and WaterSmart principles** at the same time to make the best choices for your property.
- If not done previously, request a FREE FireSmart HomePartners assessment.
- Plan for **xeriscape** gardens by planting FireSmart and drought-tolerant shrubs, flowers and lawn alternatives, such as micro clover.
- Where irrigation is needed, plan for **drip irrigation**.
- Design your landscape to **cool your building in the summer and allow passive solar gain in the winter.** Planting deciduous trees can help with this.
- Design your landscape so walking and other forms active transportation will be comfortable, convenient, safe, reliable and secure.



CONSTRUCTION PHASE

Energy efficiency

- Ask your contractor to perform **blower door tests** midway through construction in addition to the final test to help reduce any air leakage.

Waste management

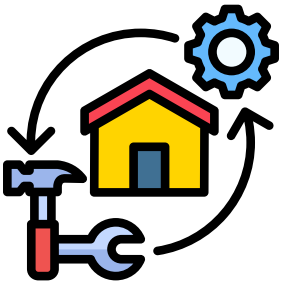
- Plan for construction waste management and reduction.

Maintenance

- Ask for an operations and maintenance manual for all products and systems installed in your home.

MAINTENANCE PHASE

- Teach everyone who lives in the home about efficient use of the household water, space heating/cooling, lighting systems and exhaust fans.
- **Follow your operations and maintenance manual guidelines**, including recommended maintenance schedules, to increase the longevity of your home.
- **Keep up to date with current waste diversion programs**, such as organics programs, recycling, and hazardous waste disposal.
- Extend the life of your irrigation systems through **proper winterization practices,** such as draining lines and storing hoses indoors.
- If not done previously, request a FREE FireSmart HomePartners assessment to determine customized solutions for FireSmarting your home and property.
- **Test well drinking water supply** to ensure it is safe before using it for drinking, cooking, bathing, showering or brushing teeth.
- **Maintain the sewer connection** between your home and the sewer system. It is your responsibility.
- **Regularly check the sump pumps** that it drains properly by pouring water into the sump pit to ensure it starts automatically. Consider back-up power.
- **Maintain septic systems** - Keep well maintained and free of clogs. If possible, avoid pumping the septic tank when flooding is forecast.



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Box 590, 202 Lakeside Drive, Nelson, BC V1L 5R4
Phone: 250.352.6665 | Email: info@rdck.ca
Toll Free: 1.800.268.7325 (BC) | Fax: 250.352.9300