

## Designing for a green lifestyle

*Changing attitudes about how our communities look and operate is an important part of sustainability. Start by talking with your family and your designer and choosing the project goals and strategies that are right for you; setting clear goals and making a plan for your sustainable building project will help you evaluate products, costs and opportunities as they arise.*

- Bigger isn't always better – determine the minimum square feet that your family requires and make your design efficient through multi-use spaces, stacking rather than spreading, and well-designed built-in features
  - Smaller footprint reduces overall costs and materials usage
  - Greater flexibility on small lots, increased green space
  - Reduced operation costs
    - Get inspired by small-footprint living with [This Old House](#) online!*
    - Check out hip, modern solutions to organization and multiuse space at [ApartmentTherapy.com](#).*
- Make lifestyle change easier by including recycling facilities, bike storage, easy access to the outdoors, and other green features in your home design from the beginning
- Utilize outdoor space in a positive way – organize a [community garden](#) or [plant a row for the hungry](#), set up a power generator to [feed the grid](#), use [organic gardening](#) products and methods... just setting aside green, growing space can make a big difference in a busy urban environment.

## Preparing for construction

- Location
  - Site selection factors: density and [brownfield](#) rehabilitation
    - By selecting urban sites with pedestrian, [bicycle](#) or public access to frequently used services and locations, you can substantially reduce the environmental impact of your lifestyle.*
  - Choosing a building site: use Passive Solar design for an energy efficient home
    - Reduces loads on mechanical equipment by capitalizing on passive heating and cooling, solar gain, thermal mass properties and natural ventilation/lighting*
    - Learn about [Passive Solar design guidelines](#)*
- Local resources and restrictions
  - Find out which Green Building technologies and methods will be a good match for your location based on availability, code, etc
    - [King County's Green Tools Program](#)
    - [Seattle City Light's Green Power Program](#)
    - [City of Seattle's Department of Planning and Development](#)
    - [Green Power with Puget Sound Energy](#)
- [State and Federal Rebates and Incentives](#)

## Caring for your building site

For general information on water management, site planning, soils and habitat preservation in our area, visit [http://www.psp.wa.gov/downloads/LID/LID\\_manual2005.pdf](http://www.psp.wa.gov/downloads/LID/LID_manual2005.pdf)

- Preserve existing vegetation and native soil – consider using cleared vegetation onsite in landscaping or construction
- Minimize soils compaction/protect ecologically sensitive areas
  - Minimize: building footprint, impermeable surface, construction footprint  
*Efficient design based on available resources and intended use*  
*Efficient scheduling and staging*
- Low water use landscape and other landscape strategies to improve soil quality and habitat
  - [Xeriscaping](#)  
*Read more at Wikipedia.com*
  - [Native planting, native topsoil preservation](#)
  - [Garden space/plan for enriching and rehabilitating soils](#)
- Erosion control, storm water management and biofiltration
  - Visit the University of Washington's [Stormwater Management](#) page
  - Use [bioswales](#) and [rain gardens](#) to mimic natural drainage patterns and filter chemical and particulate pollution from water before it re-enters the watershed or water table
- Maximize Permeable Surface
  - [Permeable concrete](#)/pavers, gravel, and other permeable hardscape improve site drainage and reduce the heat-island effect of concrete, asphalt, metal, masonry, conventional roofing materials, and other impervious surfaces.  
*[Percocrete](#) is one popular pervious concrete product.*  
*Over time, pervious solutions may lose their effectiveness due to compaction and debris accumulation. The best pervious solution is to leave it green!*
  - [Green Roof/Living Roof](#)  
*Correct selection and installation eliminate common problems such as water infiltration, weediness, high maintenance watering, etc: well-executed living roofs are low-maintenance and long-lasting*

## Recycling

- Construction waste management – sorting, recycling and donation
  - Developing a plan to share with your builder and subcontractors will improve the effectiveness of jobsite recycling and also help you earn points with programs like [Built Green](#) and [LEED for Homes](#).
- Selective demo and salvage
  - [LEED](#) Credits can be obtained by re-using existing structural or finish elements

# ROBERTS ◦ WYGAL

*Materials salvaged locally also count toward local supply chain credits*

- Recycling benefits you financially through reduced cost and tax write-offs
- [Second Use](#) and the [ReStore](#) both offer tax write-offs for donations of usable building materials. Pick-up service is available. The ReStore also offers manual demolition services and a choice of store credit so you can buy more recycled materials.

## Water Use (Interior)

*By reducing your home's total water use and supplying non-drinking water fixtures with alternative water sources, you can reduce your utility bills and preserve our supply of clean drinking water.*

- Low flow plumbing fixtures  
*The EPA offers [WaterSense](#), a program for rating home plumbing fixtures (similar to the [EnergyStar](#) rating for appliances)*
- Rain water harvesting can supply non-potable water for toilet flushing and irrigation with [rooftop rainwater collection](#) and [rain barrels](#)
- Grey water can also be collected from sinks, showers and laundry. The [Brac System](#) is approved for use in the City of Seattle.
- Composting toilets: reduces cost of plumbing to low-use areas

## Electrical Generation

*In order to make home generation cost effective, electrical use must be substantially reduced through passive strategies and efficient features. Consider making daylighting a part of your overall Passive Solar design before shelling out for Compact Fluorescents, and remember that lifestyle is one of the biggest contributors to energy use. Little things like the setting on your water heater thermostat, inactive appliances left plugged in ("[phantom loads](#)"), refrigerator thermostat, etc can have a big impact.*

**The cheapest energy is the energy you never have to buy!**

- [Start with a Do-It-Yourself Home Energy Audit](#)
- Wind Turbines: does your property have open space and generous height restrictions?  
Visit the Department of Energy's [Washington Small Wind](#) guide and the [American Wind Energy Association](#)'s webpage to learn more about home wind turbines.
- Photo-voltaic: do you have un-shaded roof area with a southern exposure?  
Find out what it would take to supply all or part of your home's electrical needs with photovoltaic panels using a [Solar Payback Calculator](#).
- Micro Hydropower: if you have access to a river or stream, you may be able to put it to work with a [micro hydropower generator](#).
- [Net Metering](#) allows you to stay connected to the grid and offset your electrical use by selling your site-generated power back to the utility company. This is usually more straightforward than a battery storage system.

# ROBERTS • WYGAL

## Heating and Cooling

- Geothermal: also known as ground source or ground coupled heat pumps and geoexchange
  - [Other efficient alternatives](#)
- Duct Sealing
  - Leaky ducts can reduce the energy efficiency of your home by 10-20%; a leak of conditioned air to the exterior means your heating system is trying to heat your whole neighborhood in addition to the inside of your home. Participating in a certification/testing program like [Energy Star](#) can prevent these problems and improve efficiency, comfort, energy bills, and indoor air quality. A certified performance tester will use a [Duct Blaster](#) or [Blower Door](#) test to determine the overall tightness of your HVAC system and/or building envelope.
- [Heat recovery ventilator](#): tightly built, efficient houses may require mechanical ventilation to maintain healthy flows of fresh air to the interior. Heat/Energy Recovery Ventilators use passive heat exchange to keep space conditioning costs down by warming or cooling fresh air to the temperature of stale, exiting air before distributing it throughout the home.

## Hot Water

- Solar hot water
- Desuperheater (couple to heat pump)
- Flash hot water heater/on demand
- Recirculation
- GFX – gravity heat exchanger to recapture
- LaundryPure – reduces water use/hot water use, no detergent required

## Building Envelope

*With some careful pre-planning, building methods and materials selections can reduce costs, increase energy efficiency, and minimize the environmental impacts of a home.*

- [Advanced Framing](#)
  - Reduces lumber needs
  - Increases depth of wall cavities for improved insulation
- Insulation: get region-specific insulation information from the [Department of Energy](#)
  - Choosing non-toxic, renewable insulation materials can also improve moisture management: for example, [cotton](#) and [wool](#) batt insulation or [soy-based foam](#)
  - [Spray Foam Insulation](#): improves air sealing as well as reducing conductive heat loss
- Windows: all new windows should be double-paned and gas filled to improve thermal performance
  - Learn about the components of window performance at the Department of Energy's [Consumer Guide](#)

# ROBERTS • WYGAL

- When placing and sizing windows in your design, don't forget to check your [Passive Solar design guidelines](#) and utilize shading from landscaping, overhangs, curtains or awnings
- [Sun-bronzing or low-emissivity coatings](#) can decrease heat loss or gain from windows and improve your home's energy efficiency. You may be able to apply a low-e coating as an upgrade to existing windows.
- Performance Testing: when new homes are built to Washington State Energy Code, it is not necessary to test envelope tightness with a Blower Door test. [Washington State University's Energy Extension](#) has evaluated existing code as a cost-effective and climate-appropriate approach to insulation and building sealing.

## Material Selection

*A lot of materials are marketed as "Green" these days; make sure the product you choose fits your own definition and your project goals. Your selection criteria may include durability, ease of maintenance, toxicity, use of natural resources, manufacturing and transport-related pollution, contribution to energy efficiency, and recyclability when the end of its lifespan is reached.*

- Learn about [Life Cycle Analysis](#), [Life Cycle Costs](#) and [Cradle-to-Cradle](#) Analysis
  - A free program for determining combined the LCA and LCC of selected products can be downloaded at <http://www.bfrl.nist.gov/oa/software/bees/buzz.html>
- Find local products and services in the [Northwest EcoBuilding Guild's GreenPages](#)
- Sustainably harvested: [FSC Certified Wood](#)
- Durability: [Insulated Concrete Forms \(ICF\)](#) and [Concrete Masonry Units \(CMU\)](#)
  - Multiple benefits – contribute to thermal mass and air sealing as well as building lifespan and low maintenance
- Low Toxicity/Indoor Air Quality (IAQ) – low VOC, formaldehyde free, low chemical
  - Visit [ecohaus](#), previously the Environmental Home Center, for products and resources