



WindmillGreenTM RESIDENTIAL

What is a Green Building?

Windmill buildings are conceived, designed and built as “green buildings.” Green buildings are about much more than highly efficient energy consumption. They are high-performance buildings, providing healthier living and working environments for less money over the long run (and often the short run, too). Green buildings are designed to maximize users’ comfort and productivity while levying the smallest possible environmental impact.

The key to this high performance building is the integration of the best technologies, materials and features in the design of the building. Windmill accomplishes these goals using tested, off-the-shelf technologies, not those still in experimental stages.

Windmill buildings are designed to earn one of the highest measures of accomplishment as a green building, the Gold certification from the U.S. Green Building Council’s LEEDTM program. Leadership in Energy and Environmental Design (LEEDTM) was created to define green buildings by establishing a common standard of measurement; to promote integrated, whole-building design practices; and to raise consumer awareness of green building benefits. It is the most recognized such certification system for green buildings in North America.





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Energy Efficiency

Buildings consume lots of energy. One-third of global primary energy is used just to maintain existing building structures and keep them running. The energy used to produce the concrete, steel, processed wood, and other materials used in construction contributes to an even greater toll buildings place on energy resources. Existing buildings in the U.S. use 37% of all energy and 68% of all electricity generated nationwide. There are great financial savings to be made by increasing the energy efficiency of buildings.

The design of Windmill buildings seek to exceed the requirements of the Model National Energy Code by 35 - 40%. Windmill incorporates many state-of-the-art technologies in cooling and heating systems, the building's exterior, and fixtures that reduce demand for energy while providing equal or greater comfort to residents. The features detailed below add up to real savings in lower heating and cooling bills.

State-of-the-art Heating and Cooling Systems:

- Individual heat recovery ventilators conserve heat while giving residents control of temperature and fresh air.
- Individual digital meters let residents see when their energy use fluctuates.
- Shower heat recovery systems recapture the heat in shower water as it drains, rather than allowing that heat resource to wash away.

Tight Building Exterior – Built for Canada's Climate:

- R30 rating for insulation of exterior walls.
- Double glazed Low-E windows will be used on the exterior of our buildings. Low emittance (Low-E) coatings are virtually invisible and reduce loss of heat while allowing visible light to penetrate through the window. Because they also reduce the amount of solar heat gain by reflecting damaging ultraviolet light and infrared light (heat energy), they perform double-duty to reduce your energy bill.
- Solar shades will be provided on the south, southwest and west facing windows. These shades will reduce the amount of light entering the interior spaces in the summer, reducing solar heat gain, and maximize the amount of light entering the interior spaces in the winter.

Quality Appliances and Lighting:

- Stainless steel Energy Star appliances: refrigerator, stove, microwave and dishwasher; many of these appliances will significantly exceed Energy Star standards.
- Highly efficient compact fluorescent lighting fixtures provide warm-coloured light while using a fraction of the energy of incandescent bulbs. They also produce much less heat, which places lower demands on air conditioning and ultimately provides further savings on your energy bill.



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Fresh, Clean Indoor Air

Cars, factories and power plants are not the only sources of pollution. Often, common products and substances within buildings cause significant indoor air pollution. Culprits often include faulty or poorly maintained central heating and cooling systems, furniture or cabinetry made from certain pressed wood products, volatile organic compounds (VOCs) in building materials, and certain household cleaning products, among many others. Inadequate ventilation intensifies the exposure to these substances.

Windmill has paid careful attention to the need for fresh air free from toxic gases and compounds. Materials used and methods of controlling emissions of harmful compounds during construction contribute to much fresher, cleaner air than in typical condominiums.

Design and Materials:

- Across-the-board emphasis on no- or low-volatile organic compounds in materials and finishes, including paints, adhesives, sealants and carpets.
- Non-urea formaldehyde composite wood products, such as kitchen cabinets.
- Operable windows to provide fresh air circulation.
- Separate ventilation of operating and maintenance, garbage and recycling rooms.

During Construction:

- Air quality management plan to guide practices during construction
- Air flushing for two weeks after completion of construction and before occupancy



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Water Efficiency

In Canada, water is an increasingly precious resource. Although Canada possesses abundant natural supplies, Canadians' per capita water use is 65% higher than the OECD average; only Americans use more water per capita than Canadians among the 29 OECD member countries. Americans, however, were able to actually decrease their total water consumption since 1980, while Canadian consumption increased 25% over this same time period, five times higher than the overall OECD increase of 5%.

Often this over-usage is unconscious; our appliances simply are not designed to conserve. The fixtures and features of Windmill buildings help residents to effortlessly reduce their consumption while maintaining the same habits.

High Efficiency Fixtures and Appliances:

You won't know you're using less water with the following features, yet you'll be saving on your water bill and helping to conserve this precious resource.

- High performance dual-flush toilets standard in all units.
- Low-flow showerheads and faucets tested for effectiveness.
- Front-loading washers (optional) reduce water consumption by approximately 15 gallons per load, saving not only water but energy and money in avoided heating of warm and hot water.
- Waterless urinals for theatre and commercial spaces.

Using Less Water, Naturally:

Windmill urban infill projects typically sit on a relatively small piece of land, yet the buildings receive significant volumes of rain and snow on the rooftop and terraces. Rather than letting this resource run down the drain, we are putting it to use in a nearly cost-free way.

- Rainwater collected on the rooftop will be stored in a cistern below grade.
- Use of collected rainwater for toilets reduces the building's overall demand for potable water.
- Landscaping features on rooftop and terraces will help absorb rainwater and slow down runoff.
- Use of native, hardy plants will eliminate need for ongoing irrigation except in drought conditions.



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Building Materials

Construction and renovation of buildings has a very large environmental impact: 40% of all raw materials are used in the construction/renovation industries; between 33-40% of our municipal wastestreams are composed of waste from construction and demolition.

In choosing the materials used in the construction of and interior finishes in Windmill buildings, we look for materials that have the smallest environmental footprint: sustainably-harvested, regionally produced, durable materials which emit little or no harmful substances. In addition, where possible, materials should be capable of being reused, salvaged, or have very high levels of recycled content so as to limit negative ecological, social and economic effects of using virgin materials.

Durable, Environmentally-Friendly Building Materials:

All materials are sourced in partnership with Healthiest Home and Building Supplies, located on Richmond Road in Ottawa, www.thehealthiesthome.com.

- Bamboo is a beautiful, durable new option for natural flooring. It is in fact a fast growing grass that is sustainably harvested every 3-6 years. When bamboo is harvested the plant is not damaged and regenerates. In contrast, the trees most popular for flooring, hardwoods, have a harvesting period of 40 – 60 years, are often not sustainably harvested and must be replanted to regenerate.
- Wool carpets are not only soft and beautiful, they are produced without synthetic materials, are highly durable, and do not emit harmful compounds as do some synthetics.
- Elegant granite countertops are locally-quarried, which supports local trades and minimizes environmental impacts of transporting materials.
- Cork flooring (optional) is made from the bark of the cork tree, and is thus rapidly renewable. It is also a recycled product, as cork flooring is made from the remainder materials from wine cork production.
- Vanity countertops will be locally-produced recycled glass terrazzo, made from post-consumer recycled glass cullet.



Measurement and Verification

Residents will have access to information regarding the proper functioning of the building systems and keeping them informed of any changes to the building's features.

How Do We Know It's All Working Right?

Building commissioning is the process by which all building systems are started and verified. Each system is tested to confirm performance on its own and in conjunction with all other systems.

- An independent commissioning agent will commission the building before occupancy.
- An independent commissioning agent will commission the building one year after occupancy to verify systems are still running as designed.
- Windmill will perform ongoing maintenance for building (subject to the approval of the HOA), providing continuity of expertise in the building systems.

We'll Keep You Informed:

A full specification package will be available when our projects are complete, detailing the fixtures, features and materials used in the building and units.

- A web site will be created to describe building features and fixtures.
- Regular communications to residents regarding building systems and programs.
- LEED™ reports will be available for review.



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Benefits for You and Your Community

Most people don't expect their physical residence to have positive impacts beyond satisfying their own needs for shelter and comfort at a price they can afford. Windmill Buildings raise the bar, however, in providing real benefits to its community, both locally and globally.

Transportation Choices

One of the most significant issues in urban areas is increasing traffic and the pollution and delays that traffic brings. Windmill buildings seek to real transportation choices available to its residents:

- Nearby public transportation to let you travel around town quickly and effortlessly.
- Large, secure bicycle storage rooms facilitate bike commuting.
- Plug-ins will be provided for alternative fuel vehicles.
- In Ottawa Vrtucar, a car-share service, will be located on site, allowing those who choose not to own cars the option of affordable, hour-by-hour rentals (www.vrtucar.com). We are implementing similar services in our other projects.

Contributing to Community Goals:

Windmill works closely with the community on our building concepts to fill diverse needs:

- We strive to be a partner with the City and use our buildings as demonstration buildings for others to emulate when moving through the City's development approvals.
- Our triple bottom line approach to development puts equal weight on ensuring our buildings are benefiting the surrounding communities by including arts facilities, affordable housing and general mixed use concepts that add to the convenience and culture of the surrounding neighborhood.
- We use our buildings as examples to deliver continuing education and programming regarding green buildings.
- High density maximizes use of infill site, supports civic goals of urban intensification.
- Wherever possible, we are working with local tradespeople to source materials, and are encouraging the growth of local green buildings expertise.



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Benefits (continued)

“Acting Globally”:

Our environmental stewardship extends to communities beyond our cities and regions.

- Appliances throughout our buildings will not contribute to ozone depletion, as they will use no CFCs, HCFCs or Halons (ozone-depleting refrigerants).
- Rooftop landscaping helps to reduce urban “heat island effect” by absorbing the heat of the sun and reducing reflectivity.
- The general design of our buildings reduce the GHG’s (green house gas) emissions substantially.

Climate Impacts

Buildings have a direct impact on climate, through their greenhouse gas (GHG) emissions. Approximately 10% of all GHG emissions in Canada come from direct operating energy consumption in buildings. The construction industry contributes another 30% of GHG emissions indirectly through the production, transportation and waste of materials. Cement production alone accounts for 8% of Canadian GHG emissions.

- 40% fly-ash concrete will be used in building construction, generating lower GHG emissions than conventional concrete. Fly-ash is a waste material which can be used to produce a superior concrete, replacing up to 35% of the Portland cement found in conventional concrete mixes. Each ton of fly-ash used to replace a ton of cement saves the equivalent of approximately one barrel of oil, thus producing lower emissions that contribute to global warming.
- Our emphasis on locally-sourcing our construction materials will reduce transportation distances for such materials – yielding a hard-to-quantify but real climate benefit over standard construction industry practices.
- An overall 40% reduction in energy use as compared to a conventional condo building equates to a significant reduction of carbon released to atmosphere over the life of building.

The statements in this brochure represent the best knowledge of Windmill Development Group as of June 15, 2004. The features described are subject to change.

Please contact Windmill for more information about the sources used in this document or for more information.