APPENDIX C
Best Practices Overview

City of Pickering Sustainable Neighbourhood Plan Best Practices Overview

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Submitted by

Dillon Consulting Limited

Pickering Sustainable Neighbourhood Plan
Best Practices Overview

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1.0 OVERVIEW

The City of Pickering has initiated the Sustainable Neighbourhood Plan (SNP) for Pickering. Through the SNP, sustainability principles and strategies with measurable criteria will be developed as the basis for Sustainable Neighbourhood Design Guidelines for future development in Pickering. The draft Guidelines will also be applied to a conceptual development area to illustrate and test them. Consultation will take place throughout the process to obtain feedback and innovative ideas.

The SNP is to be carried out in conjunction with the Partners for Climate Protection project. The SNP will incorporate an integrated approach to community design with a focus on reducing the environmental impact of the built environment. Sustainable design measures will be assessed to reduce environmental impact and achieve economically viable neighbourhood designs with respect to transportation, energy supply, building envelope design, HVAC (Heating, Ventilating, and Air-Conditioning), stormwater management, naturalized landscaping, solid waste management and site design. The outcome of the study will be a set of universally applicable guidelines.

The process for determining appropriate design measures began with a review of best practices in the GTA, as well as cutting edge 'green' development activities in municipalities across Canada. This document provides a description of ten innovative projects undertaken by municipalities and developers to implement sustainability goals. The projects reflect the best current, leading edge initiatives as identified by CMHC, FMC and Dillon Consulting Limited staff. The case studies provide an overview of seven municipalities currently implementing or developing innovative guidelines for their communities to encourage development that reduces environmental impact. Three case studies on innovative builders and developers that are voluntarily incorporating green development measures in new developments are also included.

The Best Practices Overview will serve as a resource for City staff and stakeholders, providing information on key aspects of each of the case studies, as well as contact information.

To develop objectives and strategies for the Guidelines, the LEED-ND (Leadership in Energy and Environmental Design Neighbourhood Developments) Rating System will be used as a model.

2.0 BEST PRACTICES OVERVIEW

Canadian urban and suburban jurisdictions are being increasingly confronted by deteriorating environmental conditions due to a wide range of factors, such as increased automobile dependency, contaminated air, water and soil, and pressure on energy and other non-renewable resources. Conventional design guidelines for new developments have tended not to include performance targets related to environmental issues, such as air quality and water and energy use. It would appear, however, that a new trend is emerging whereby municipalities are either requiring 'green' performance measures for all new development, or are incorporating environmental guidelines and/or performance requirements in planning policies, such as secondary plans, plans of subdivision, urban design guidelines, and zoning by laws.

In Canada, this is a fairly recent trend. In western Canada, Calgary and Vancouver have adopted green building guidelines.[1] In central and eastern Canada, no municipality has yet to adopt green development

[1] In July 2004 Vancouver adopted LEED Gold as its standard for all new city buildings (the first municipality in Canada to do so). Calgary requires that new public buildings in excess of 500m^2 attain LEED Silver certification. PWGSC has committed to achieving LEED Gold/BREEAM Four Leaves or equivalent standard for all new PWGSC buildings by 2005.

standards, although several guidelines have been developed for specific areas, generally through the adoption of Secondary Plans.

In other cases, developers and/or builders are voluntarily working with municipalities and environmental agencies to explore ways of incorporating green development measures.

Green development measures tend to address aspects of site design that fall into the following categories:

- Site selection;
- Green building design (building envelope, orientation, indoor air quality & HVAC&R (Heating, Ventilation and Air Conditioning, and Refrigeration infrastructure);
- Energy (on or offsite renewable energy);
- Solid waste management;
- Water & wastewater;
- Stormwater management; and,
- Transportation.

Green development guidelines are meant to provide design guidelines, or, in some cases, performance targets, that, when implemented, result in a reduced environmental impact as a result of the built environment.

The Best Practices Overview provides an overview of some of the most progressive sustainable planning activities underway in the Canada. Case studies were selected based on (1) the degree of innovation, either with respect to the process or the environmental design measures being incorporated, and (2) comparability to the context of the Sustainable Neighbourhood Plan in Pickering. All of the case studies selected provide information that will be useful in attempting to develop a sustainable neighbourhood plan as well as green development standards and/or guidelines. In addition, three case studies are provided on innovative builders and developers that are voluntarily incorporating green development measures in new developments.

Each case study provides a brief description, highlights design features and environmental benefits, and provides information on the policy and/or implementation strategy (for municipalities) or marketing strategy (for builders/developers). Contact information is also provided. The ten projects covered are:

- Sustainable City Project, Vaughan
- Sherwood Survey Secondary Plan, Eco-Tech Village, Milton
- North Oakville Secondary Plan, Oakville
- Plan of Subdivision, Stickwood Walker Property, Town of Newmarket
- Drake Landing Solar Community, Okotoks
- Southeast False Creek, Vancouver
- East Clayton, Vancouver
- Marshall Homes, Copperfield, Oshawa
- Jeffrey Homes, The Birches, Whitby
- Windmill Developments, Dockside Green, Victoria

Green Municipalities

2.1 Sustainable City Project, Vaughan[2]

Organization:
Toronto Region Conservation Authority (TRCA)
Description:
• A "Living City" initiative to explore barriers to applying "green design" to community development • Project to include 400 homes, two schools, and a mix of other uses such as commercial, transportation, and a greenspace network. • Approximately 100 ha of a 400 ha block (block 39 in Vaughan)
Design Features:
• Design will incorporate best practices in community design and building construction, such as LEED platinum (see below). • Note that the design will only apply to a portion of Block 39, as 70% of the block has already been developed or proposed for development. In addition, much of the planning for the block has already been determined in terms of transportation plans and schools.
Environmental Benefits:
• Significantly reduced environmental impact. • Specific initiatives addressed at the workshop as options included geo-thermal exchange, solar energy, and green building design standards (LEED, BuiltGreen).
Strategy:
• The TRCA has a number of organizations and corporations taking part including the CMHC, the City of Vaughan, local developers, builders, utility companies, and the district school board. In August 2005, a workshop was held to discuss a local action plan to increase the adoption of best practices in green community design and green housing construction. • The action plan will accomplish this by identifying best practices, benchmarking the current state of best practices in community design and housing construction, identifying barriers to and levers for promoting market penetration of best practices, creating an implementation plan and publishing and promoting the results on the TRCA's webpage.
Contact Info:
Andrew Bowerbank, TRCA Phone #: 416 661 6600 x5343 E-mail address: abowerbank@trca.on.ca Project website: www.trca.on.ca/living_city/


[2] The Living City, Supporting Residential Community Development, TRCA, 2005

2.2 Sherwood Survey Secondary Plan, Eco-Tech Village, Milton[3]

Participants:

Town of Milton, Federation of Canadian Municipalities – Green Municipal Funds, Smart Growth Secretariat, Province of Ontario, Canada Mortgage and Housing Corporation, Regional Municipality of Halton, Bell Canada, Mattamy Development Corporation, Milton Hydro Distribution, Ozz Corporation, Rogers Cable and Union Gas Limited.

Description:

- The Town of Milton initiated the Eco-Tech Village design project in 2001 based on an increasing interest in ecological design in the community and a need to respond to rapid future growth.
- For the purposes of a design charette held in the spring of 2002, a theoretical 20 Ha area was selected that contains a secondary mixed-use node (10 Ha), a residential neighbourhood (10 Ha), a stormwater management pond and a village square
- The site is owned by Mattamy, one of the partners in the design exercise

Design Features:

- Three different designs were developed at the design charette. The preferred design was selected as a pilot project to be developed by Mattamy (see website)
- Design is based on 7 principles: environmental sustainability, ecological sensitivity, energy efficiency, financial accountability, economic viability & marketability, technical advancement, smart growth

Environmental Benefits:

- The plan promotes sustainable development, technological advancements and fiscal responsibility and municipal governance.

Planning Process & Implementation Tools:

- The Sherwood Park Secondary Plan (which includes the area owned by Mattamy) provides environmental guidelines for an Eco Tech Village
- An upcoming Official Plan Review will result in updated references to Sustainable Development Guidelines and the Eco Industrial Park
- Process involved all members of development industry to ensure success of the project.
- Several reports (Sustainable Development Guidelines, Planning Indicators and Monitoring Program) are available on the Town of Milton website.
- As of September 2005, building permits had been issued to Mattamy for model homes and construction was reported to have begun.

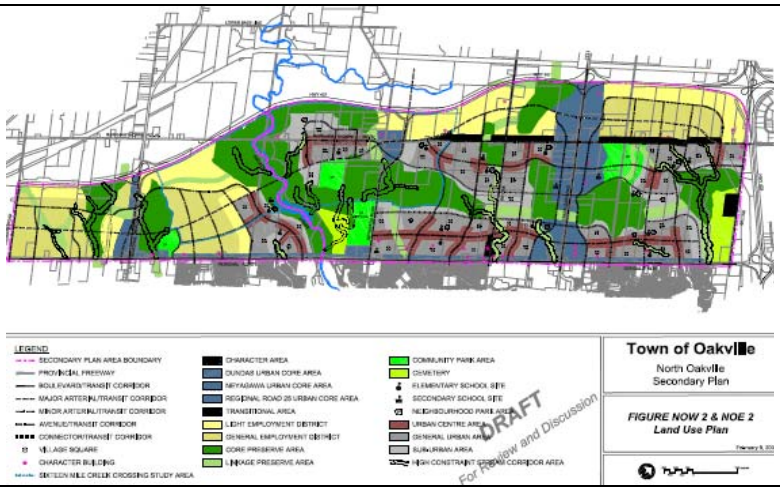
Contact Info:

Bill Mann, Manager of Planning Policy
Town of Milton, www.milton.ca
Phone #: 905-878-7252 ext 2304
E-mail address: planning@milton.ca

One of the plans from the design charette

[3] *Town of Milton,* www.milton.ca and *Town of Milton Eco-Tech Village Pilot Project Urban Design Charette: Making Choices Towards Sustainability, CMHC, 2003.*

2.3 North Oakville Secondary Plan, Oakville[4]

Organization:
Town of Oakville
Description:
• 3,000 hectares north of Dundas • Greenfield development • 55,000 residential units, 35,000 jobs
Design Features:
• Plan emphasizes New Urbanism type design: mixed use, compact, pedestrian friendly environments, residential and employment areas are developed around 5 and 10 minute walking radii (called 'pedestrian sheds') • Plans to incorporate eco-industrial park with connections to existing Zenon Environmental building • Strong commitment to high-density corridors along major streets (Trafalgar) • Andres Duany led design workshop. Proposed design focuses on neighbourhoods with their own centres, all houses accessible to public transit.
Environmental Benefits:
• Reduction in solid waste generation • Reduced consumption of land and other non-renewable resources (water & energy) • Improved air quality
Strategy:
• The Secondary Plan includes a section outlining the sustainable development strategy providing guidelines with respect to the built form, energy, solid waste, etc. Performance measures, particularly for green buildings, will be incorporated as zoning by-law requirements. • Council has not yet adopted North Oakville Secondary Plan. Issues Report and Implementation Study have yet to be completed for council's consideration.
Contact Info:
Ron Thun City of Oakville Planning Department (905) 845-6601 ext. 3029 rthun@oakville.ca


[4] www.oakville.ca

2.4 Plan of Subdivision, Stickwood Walker Property, Town of Newmarket

Developer / Participants:

Menkes Homes Inc.

Description:

- 90 acre property owned by the Town of Newmarket
- Council approved a draft plan of subdivision for a major recreation complex, 160 single family detached dwellings and a 50-unit apartment building.
- Within the subdivision, Council has approved a 34 unit single family sustainable housing development on Mulock Drive (referred to as the Stickwood Walker Property)
- Menkes Homes Inc. purchased the 23.58 acre property and will develop the lots according to the green building requirements agreed to
- Project will act as a demo pilot project for green building practices

Design Features:

- Exact design details not yet available
- Design will endeavour to maximize solar gain & cross ventilating, control summer cooling through building design and on-site landscaping with native plant material, minimize impervious surfaces, reduce carbon emissions, achieve optimal levels of envelope air tightness, and make use of recycled or natural building materials
- Design may also incorporate renewable energy and on-site composting

Environmental Benefits:

- 25% reduction in household water draws compared to conventional homes
- 60% reduction in overall discharge flow compared to conventional homes
- 60% reduction in solid waste compared to conventional homes
- 60% reduction in energy use compared to conventional homes
- 60% reduction in greenhouse gases

Strategy:

- Town of Newmarket developed clear green building requirements in Terms of Reference for draft plan of subdivision and used a competitive bidding process to select the best design.
- A voluntary lot levy of $1,000 per lot will be given to the Town in order to assist with the construction of a trail on lands adjacent to the subdivision. Menkes has offered to pay this levy. In return, the Town will complete an external trail system prior to first occupancy.

Contact Info:

Dennis Ramsarran, Councilor, Town of Newmarket
(905) 868-8364
Representative of Newmarket Environmental Advisory Committee

Richard Nethery, Director of Planning
Town of Newmarket
(905) 953-5321

2.5 Drake Landing Solar Community, Okotoks[5]

Developer / Participants:

- CANMET Energy Technology Centre, Natural Resources Canada
- Town of Okotoks - municipal authority
- United Communities - developer
- Sterling Homes Ltd. - home and garage builder
- ATCO Gas - utility operator
- EnerWorks Inc. - solar collector and solar domestic hot water system supplier
- Nu-Air Ventilation Systems Inc. – air-handler units supplier
- Science Application International Corporation (SAIC Canada) - project coordinator
- Enermodal Engineering Ltd. - solar and heating system design
- Sunbow Consulting Ltd. - subdivision design
- Hurst Construction Management Inc. - energy centre building and system construction

Description:

- Okotoks, Alberta (population 12,000), located 40 km south of Calgary, typical satellite community, 40-45% of population works in Calgary
- In 1998, after experiencing growth rates exceeding five percent since 1985, the Town adopted a resolution to pursue a sustainable approach to development. Okotoks is the first community in Canada to limit their growth based on the available water supply.
- Drake Landing is a result of this initiative: a subdivision of 52 solar heated homes

Design Features:

- Community is heated by a district system designed to store solar energy underground during the summer and distribute the energy to each home for space heating needs during the winter. This is the first design of its kind in the world. It will take approximately 4 years to have the system 'charged', during which time heating requirements will be provided by Atco Gas. Once the borehole system is operational, Atco Gas will continue to provide back-up natural gas heating. A not-for-profit partnership has been established between the developer, builder, utility service provider and the municipality to oversee the implementation of the geothermal solar heat storage system.
- Okotoks will be the largest subdivision of R-2000 single family homes in Canada
- Okotoks purchases 60% of its electricity from renewable energy sources (Okotoks is part of a consortium of Albertan municipalities that purchase electricity wholesale. Okotoks is the #1 municipal purchaser of renewable energy in Canada.
- Sewage treatment plant will use a "vessel composting" system, first of its kind in Canada (closed vessel composting – resulting Class A compost will be used as landfill cover material)

Environmental Benefits:

- Solar energy will be used to meet 90% of residential space heating needs, significantly reducing dependency on fossil fuels.
- A reduction of 5 tonnes of greenhouse gases per household, or 260 tonnes per year for the community.
- Each R-2000 homes will be 30% more efficient than a conventionally built home.

[5] Drake Landing is an exceptional example of grassroots sustainable community planning. Beginning in the late 1990's, the Town of Okotoks created a Legacy Plan, which outlines the community's commitment to growth within the limits of the natural carrying capacity of Sheep River. The community set water use and sewage treatment guidelines and identified growth boundaries. Drake Landing is one of the outcomes of the community's commitment to progressive, innovative community development. As a result, the Town of Okotoks has received numerous awards (FCM, Alberta) and has been nominated for a UN Liveable Communities award. For more info: www.town.okotoks.ab.ca/solar/DrakeLandingNew.html and Drake Landing: www.dlsc.ca/index.htm

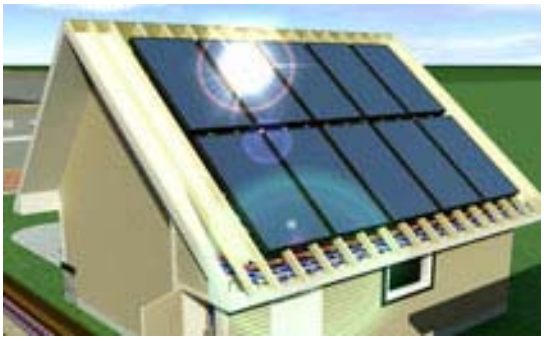
Strategy:

- Homeowners charged a favourable long-term fixed monthly fee. Although not competitive with the cost of today's fossil fuels, costs are less than more expensive electric heating. Operating costs are lower than those of a combustion furnace.
- As of September 2005, show homes are almost completed and ready for viewing.

Contact Info:

Doug McClenahan
Manager, Active Solar R&D
Natural Resources Canada
(613) 996-6078
dmcclena@nrcan.gc.ca

Richard Quail
Municipal Manager
Town of Okotoks
(403) 938-8908
rquail@okotoks.ca



2.6 Southeast False Creek, Vancouver[6]

Developers/Proponent:

City of Vancouver owns approximately 60% of the land. Remainder is privately owned.

Description:

In 1991, Vancouver City Council adopted a motion to develop Southeast False Creek (SEFC) as a model sustainable community that "incorporates principles of energy efficient design in its area plan". The SEFC site is approximately 80 acres (36 hectares) of former industrial land near downtown Vancouver. Of this, 50 acres are publicly owned with the remainder privately owned.

Design Features:

- Performance targets have been developed for solid waste, transportation, energy, air emission, soil, water and open space.
- Privately developed buildings require LEED silver, civic buildings must achieve LEED gold.

Environmental Benefits:

- Water and energy reductions, solid waste generation reduction, increased impervious area resulting in increased stormwater infiltration, improved air quality
- 12% of produce consumed by residents to be grown on-site (urban agriculture)

Strategy:

- All new civic buildings must achieve LEED Gold (City policy since 2004)
- A policy statement outlines the City's commitment to sustainable development, including directions on how to achieve this with respect to land use, built form, transportation and circulation, environment and economic development.
- Four background documents (water & wastewater, transportation, urban agriculture and energy options) further explore opportunities and best practices for the site and identify implementation tools. The background documents and policy statement led to the development of an Official Development Plan (ODP) (enacted July 2005).
- Section 2.2 of the ODP identifies sustainability principles and incorporates sustainability indicators and targets, as well as stewardship and monitory policies.
- Developers have responded to an EOI (Expression of Interest) for the Olympic Village, which will be located on public lands in Southeast False Creek. The EOI outlined the City's desire to have buildings achieve at least Silver LEED (preferably Gold), with a 30/30/30 split of affordable/modest/market housing. As of Sept. 2005, the City was reviewing submissions.

Contact Info:

Southeast False Creek Public Lands	Southeast False Creek Private Lands
Kyra Lubell	Kirsten Robinson
604-871-6863	604.871.6562

[6] http://vancouver.ca/commsvcs/southeast/

2.7 East Clayton, Vancouver[7]

Developers/Proponents
City of Surrey, the Pacific Resource Centre, and UBC's James Taylor Chair in Landscape & Livable Environments. An advisory committee included area residents, members of the development community, and various interested agencies, including the Real Estate Foundation of BC, Fisheries and Oceans Canada, Environment Canada, CMHC, the Federation of Canadian Municipalities, Agriculture Canada, the Ministries of Municipal Affairs and Agriculture, & the GVRD.
Description:
• The East Clayton area represents a 500-acre greenfield site in Surrey B.C. • The East Clayton Neighbourhood Concept Plan was officially adopted by Surrey Council in April 2002. Construction of Clayton Village, the area's first development, began in 2002. The 31-acre project represents a variety of housing options, including 142 single family residential homes on different sized lots, 72 town homes and 23 detached strata homes.
• **Design Features**:
• Walkable neighbourhoods including 5 minute walking distance to transit and shops. • Interconnected street system, narrower streets with trees • Some car storage and services handled at the rear of the dwellings (in a lane) • Higher densities, different dwelling types in the same neighbourhood and on the same street • New small lot zones with provision for secondary suites and coach houses • 'Special residential' zoning which promotes live/work environments • Mixed use: Employment areas, shopping areas and varied residential in the same community • 'Natural' drainage systems (swales in boulevards) promotes infiltration of surface water • On-site detention of stormwater through retention of topsoil, exfiltration pits and exfiltration swale systems
Environmental Benefits:
• Sound storm water management, reduced vehicle trips, environmental preservation, energy savings
Strategy:
• Use charrette approach to involve stakeholders at the outset. • Involve the development industry. • Educate homebuyers • Share the risk with developers and municipality.
Contact Info:
City of Surrey Bhargav Parghi (604) 591-4394


[7] City of Surrey, BC www.city.surrey.bc.ca

Green Builders

2.8 Marshall Homes, Copperfield, Oshawa[8]

Developer:

Marshall Homes

Description:

- 88 detached traditional homes
- Greenfield development

Design Features:

Buyers can opt for an 'energy saving' package consisting of a combination of the following:

- High efficiency dual burner furnace with variable speed fan
- Heat recovery ventilators
- Windows with low E coating on inside
- Increased insulation, house wrapped in Tyvek or Typar
- Kid friendly streets with community facilities in-place
- Energuide blow test and rating

Additional features include:

- Solar panels to heat hot water
- Houses prepped for future conversion to solar or wind electricity

Environmental Benefits:

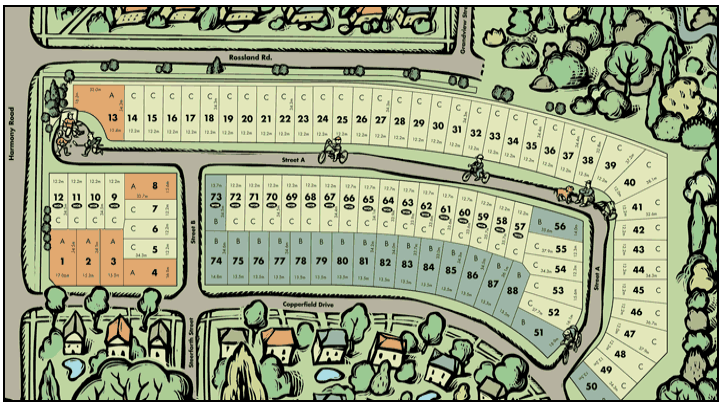
- Reduction of 4 tonnes of GHGs per house (compared to conventional design)
- Currently assessing the potential for ground heat storage (for solar heating) and geothermal heating and cooling

Marketing Strategy:

- Upfront marginal capital costs $7,500 - $9,500 (depends on type and size of house)
- Payback period less than 10 years, 10% annual Return on Investment (approximately), annual savings of $800 - $1,300 for energy bills
- 75% of houses are opting to buy the package of energy saving measures (up from 15% initially) – does not include solar panels

Contact Info:

Craig Marshall
Phone #: 905-509-8278



[8] Marshall Homes www.mycopperfield.ca

2.9 Jeffrey Homes, The Birches, Whitby

Developer:

Jeffery Homes, Whitby, Ontario

Description:

- Contains first Energy Star house to be completed in GTA (second in Canada)
- 102 bungalow and two-storey detached homes
- 41 and 45-foot lots (1,523 – 2,890 ft^2)
- Greenfield development

Design Features:

- Ultra high efficiency furnace with continuous fan
- House wrapped to block wind and water penetration
- Features included that are beyond Energy Star requirements
- High-efficiency hot water heater, humidistat which adjust the home's temperature and humidity, compact fluorescent light bulbs, dual flush toilets

Environmental Benefits:

- Houses are 42-45% more energy efficient than those built to Ontario Building Code standards
- Water reduction as a result of water efficient appliances and fixtures

Marketing Strategy:

- Buyers can opt for Energy Star packages worth $6,700 to $8,700 as part of a $10,000 free upgrades offer or a less expensive "J-Star" package
- Buyers can expect to save $500 - $1,200 per year
- Houses priced at $329,000 to $355,000

Contact Info:

Contact: Sharon Calton-Jeffery
Phone #: (905) 433-4701
www.jefferyhomes.com

2.10 Windmill Developments, Dockside Green, Victoria[9]

Developers:

Windmill Development Group Ltd., VanCity Enterprises Ltd.

Description:

- 11.6 acre brownfield site, downtown Victoria

Design Features:

- Dockside Green to operate as a "closed loop system"
- Biomass energy cogeneration (woodwaste-to-energy utility plant)
- Geothermal heat pumps for commercial building (cooling)
- Solar water heating
- On-site grey and blackwater treatment (all sewage will be treated on site)
- Wise Energy Co-op biodiesel facility (a privately owned commercial enterprise will use waste by-products to generate energy)
- Car share/ Neighbourhood Electric Vehicles/ Priority parking for alternative vehicles

Environmental Benefits:

- Greenhouse gas neutral (no net emissions of GHG from the development)
- No potable water use in irrigation for both public and private developments
- Potable water reduction in buildings
- Promotes alternative modes of transportation
- 95% construction waste diversion goal
- On-site composting

Strategy:

- VanCity uses a triple-bottom line approach
- Partnerships with City of Victoria
- Funding from FCM

Contact Info:

Windmill Development Group Ltd.
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joe@windmilldevelopments.com
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VanCity Enterprises Ltd.
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www.vancity.com

[9] www.docksidegreen.ca

3.0 NEXT STEPS

We have identified a list of additional case studies that Pickering may wish to review, time permitting. Another possibility is to see if UOIT students could further expand on the Best Practices Overview. Additional projects include the following:

- Maple Ridge, BC
- Squamish, BC
- Banff Green Building Guidelines
- Regina Affordable Housing Project
- Region of Waterloo, Light Rail Transit Corridor
- Calgary 100 Year Sustainable Plan
- Niagara Development Standards
- Iqualuit, Blueberry Hill
- Regent Park, Toronto, ON