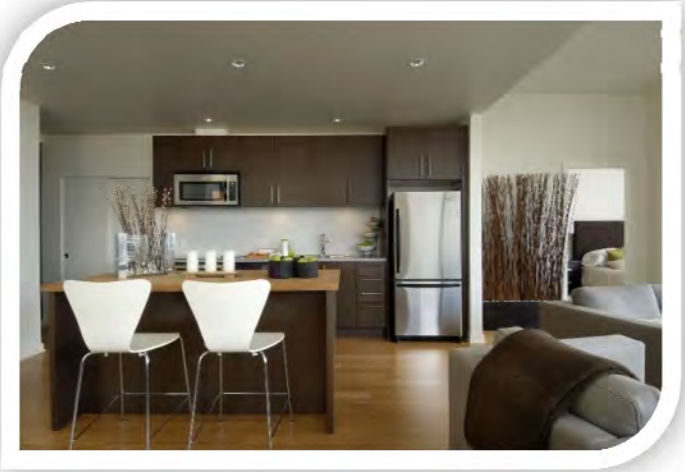
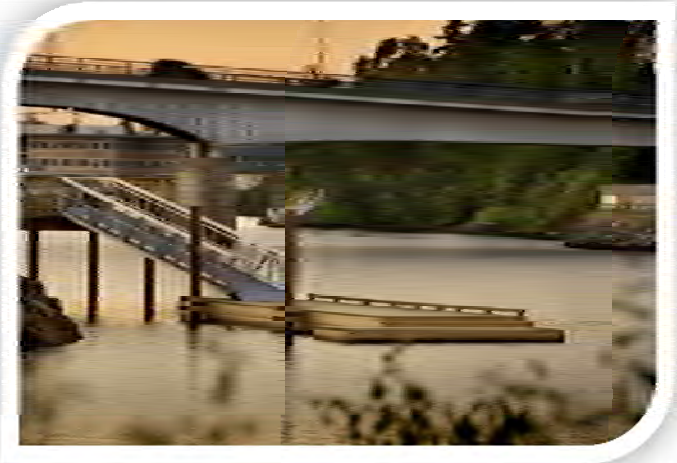
DOCKSIDE GREEN

Annual Sustainability Report 2011





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Introduction

Dockside Green is a 1.3 million square foot mixed-use sustainable community development on a 15-acre former brownfield site located in Victoria, British Columbia. The project is made up of residential, office, commercial and light industrial uses.

This report tracks the progress that has been made to date on the stated environmental, social and economic goals including the successes and challenges that have been faced.

We would like to acknowledge the support of the City of Victoria, the Capital Regional District, the Ministry of Environment, and the Federal Government all of whom are assisting in making our vision become a reality.

We also extend a special thank you to our staff, consultants, contractors, the many sub-trades and suppliers. Without your dedication and hard work the project would not be what it is today; a global showcase of environmental, social and economic responsibility.

Vision Statement
Dockside Green will be a socially vibrant, ecologically restorative, economically sound and just community. It will be a distinct collection of beautifully designed live, work, play and rest spaces designed to enhance the health and well being of both people and ecosystems, now and in the future.

Master Plan


WASTEWATER TREATMENT PLANT
R1 - SYNERGY
R2 - BALANCE
R3 - HARMONY & TRANQUILITY
R6 - AFFORDABLE HOUSING
CI-1 - INSPIRATION
CI-2 - PROSPERITY
CI-3 - EVOLUTION
FARMER CONSTRUCTION HEAD OFFICE
CI-7 - INSIGHT
BIOMASS PLANT

Completed Phases

Phase 1 – Synergy (Residential)	Phase 2 – Balance (Residential)
	
• 95 Suites / 3 Commercial spaces • 5 storeys and 8 storeys • 389, 391, 395, 399 Tyee Road	• 171 Suites • 9 storeys and 10 storeys • 373 and 379 Tyee Road
Phase 1 – Inspiration (Commercial)	**Phase 2 – Prosperity (Commercial)**
	
• Retail and office space • 398 Harbour Road	• Office Space • 388 Harbour Road
Wastewater Treatment Plant	**Biomass Plant**
	
• 390 Harbour Road	• 354 Harbour Road
Farmer Construction Head	**Naturalized Creek System**
	
• 360 Harbour Road	• Phase 1 and Phase 2

Summary of Achievements to Date

- LEED® Platinum ratings achieved on all residential and commercial buildings completed to date
    - Synergy – LEED® NC (2009)
    - Balance – LEED ® NC (2011)
    - Inspiration – LEED® CS & CI (2009)
    - Prosperity – LEED® CS (2011)
    - Farmer Construction Head Office – LEED® CS (Privately developed and owned)
- The entire project is at Stage Two under the LEED for Neighbourhood Development rating program
- American Standard Grand SAM Award 2010 – SAM Awards, CHBA
- Project of the Year 2009 - CARE Awards, CHBA-Victoria
- Top Ten Green Projects Worldwide - AIA (American Institute of Architects)
- Residential Development of the Year 2009 – Georgie Awards, CHBA-BC
- Completion of the biomass heat generation plant
- Completion of the sewage treatment plant
- The stormwater management plan is in place with the first half of the naturalized creek completed
- Meters measuring hot and cold water, heat and electricity are installed in each suite, allowing for residents to pay only for what they use
- Building energy modeling projects 50-52% in energy savings compared to the Canadian Model National Building Code
- Variations of green roofs are featured in Synergy, Balance, and Inspiration
- Active promotion of sustainable and bioregional economies
- The remediation of the on-site park is complete with plantings of native and adaptive species
- An excellent working relationship with the Victoria West Community Association has been forged
- A video has been produced to showcase support from Chamber of Commerce, Sierra Club and Vic West Community Association
- A Housing Affordability Strategy was completed in 2007 and is being implemented in stages
- Market affordable ownership suites completed to date include nine suites in Synergy and seventeen suites in Balance
- A Memorandum of Understanding has been signed with the Songhees and Esquimalt First Nations which initiated First Nations art installation along with a First Nations training initiative
- A portion of the Princess Mary building has been preserved and redeveloped as Farmer Construction's new head office with the remainder of the building deconstructed in 2011

Environmental Goals

LEED®

Goal #1:
LEED® Ratings - deliver LEED® Canada NC (New Construction) 1.0 Platinum Certification on eligible buildings developed on the lands purchased from the City, and LEED® Canada NC 1.0 Silver on the privately purchased Princess Mary lands

Status:
Residential Phase I - Synergy
LEED® Platinum NC (New Construction)
63/70 points

Residential Phase 2 – Balance
LEED® Platinum NC (New Construction)
63/70 points

Commercial Phase 1 – Inspiration
LEED® Platinum CS & CI (Core and Shell / Commercial Interiors)
53/61 Points

Commercial Phase 2 – Prosperity
LEED® Platinum CS
60/70 Points

Farmer Construction (privately owned)
LEED® Platinum CS
53/61 Points

*Biomass Plant and Wastewater Treatment Plant cannot be certified under LEED® Canada NC 1.0 and therefore did not pursue certification

Background:
The LEED® rating system administered by the Canada Green Building Council www.cagbc.org and United States Green Building Council www.usgbc.org is a green building rating tool that assesses the environmental impact of buildings. Under LEED®, a 70 point rating system, a building is independently audited to establish a certification level of a building performance. The system includes prerequisites and credits in five principal LEED® categories:

1. Sustainable Sites
2. Water Efficiency
3. Energy and Atmosphere
4. Materials and Resources
5. Indoor Environmental Quality

Points are earned by fulfilling the requirements laid out in each credit; the total number of points awarded in all credits and categories determines an overall rating of Platinum, Gold, Silver or Certified for a project.

Certification Level	Points
Certified	26 to 32
Silver	33 to 38
Gold	39 to 51
Platinum	52 or more

Water Conservation

Goal #2:
Sewage Treatment - treat 100% of sewage generated from the site

Status:
The plant has been operating since June 2008 and faced a number of technical issues. These issues have been resolved and the plant is operating as intended meeting the compliance requirements of the Ministry of Environment.

At full project completion, treated flows from the site will equal 380 cubic metres per day (702,240 gallons in a week) – equivalent to the amount of water it takes to fill an Olympic-sized swimming pool. The treated water is used in all buildings for toilets, on-site irrigation and green roof garden maintenance.

It is estimated that the use of treated water will save about 30.8 million of water per year at project completion. The remaining treated water is used to fill the completed portion of the naturalized creek system. The creek will ultimately flow from the far south end to the far north end of the site. All potable water used for bathing, drinking and washing is provided by the regional water system. Because of the water re-use program and sewage treatment plant; the community will be using treated water to flush toilets, for irrigation and to fill water features resulting in significantly less water use than typical developments in Victoria.

Background:
In Canada, approximately 340 litres of potable water per person per day is used. Toilet flushing alone uses the most water in buildings, accounting for approximately 4.8 billion litres per day.

Goal #3:
Water Efficiency (Buildings) - reduce potable water consumption by 60% as compared to the LEED® baseline requirements

Status:
The water use reduction for Synergy and Balance is 67.5%.

Background:
The table below compares Dockside Green's water usage standards with those of conventional design.

Appliance	Standard	Dockside Design
Shower Heads	9.5L/minute	4.7L/minute
Lavatories	8.3L/minute	1.9L/minute
Kitchen	8.3L/minute	3.4L/minute
Toilets	6.0L	6.0/3.0 L
Urinals	1.0 G	0.0 G

The strategy of decreasing the water loads was an integral component in reducing the capital and operating costs of the sewage treatment plant. The use of water-efficient appliances and treated water in toilets and irrigation is projected to save approximately 70 million gallons of water per year – an amount equivalent to the entire Capital Region's water use on the driest day of the year. Separately, the water efficient appliances are expected to save approximately 39.2 million gallons of water per year.

Meters measuring hot and cold water use are installed in each suite. These meters interface over the internet allowing for greater consumption awareness which has resulted in a reduction of usage by residents.

Goal #4:
Water Efficiency (Landscaping) - use no potable water for on-grade landscaping

Status:
Only treated water and rainwater are used for landscaping. The use of native and adaptive species has significantly reduced the demand for treated water for irrigation.

Goal #5:
Stormwater Treatment - treat all stormwater via a naturalized creek and pond system

Status:
Stormwater management plan is complete and in place.

The system uses the on-site naturalized creek and pond system, along with some underground storage to treat and control flows. The system is designed well beyond LEED® standards and can accommodate a 1-in-100-year rain event for the majority of the system and 1-in-25-year event for the balance of the system. The design promotes integrated stormwater and urban ecology features including green roofs. The plants selected in the naturalized creek and pond system ("greenway") are native and adaptive species.

The Municipal Parks Department was concerned about the costs of maintaining a rain garden approach to "parking bulb" treatments on their roads. Dockside Green therefore agreed to install and pay for these as a pilot case for the city.

In 2009, crayfish were transferred into the greenway as a means of improving the quality of the water in the greenway. The crayfish were to naturally clean the water by eating phytoplankton and algae. Over the past two years we have seen numbers dramatically reduce due to the appearance of otters from the harbour, and it was decided to explore alternative methods of algae control.

Energy Conservation

Goal #6:
Building Energy - design buildings that are 47% more energy-efficient than those designed to meet the Model National Energy Code (MNEC)

Status:
The modeled energy savings for the buildings in Synergy and Balance are 53% higher than those set in the MNEC.

The design strategy focuses first on passive design which means understanding how building orientation affects energy performance and that each face of the building will perform differently. Building insulation, window shading and day lighting all affect the size of mechanical systems needed and operating costs.

To address passive design, a number of notable features have been included:

- Averages of R17 wall insulation and R22 roof insulation
- Low E double-glazed windows provide a cool atmosphere in the summer and warm atmosphere in the winter resulting in increased indoor comfort and less energy consumption
- Most south-facing and west-facing windows are equipped with motorized exterior sun shades to provide shade during the summer months
- LED lights are used in corridors and compact fluorescents are used in suites and common areas that save energy and maintenance costs
- Heat recovery technology captures the heat from ventilated air being exhausted to pre-warm incoming heat
- A four-pipe fan coil system is used with two of the pipes designated for domestic hot water and cold water supply system. This provides some free cooling to the retail spaces.

Improving energy efficiency has resulted in lower operating costs for occupants and future-proofs against rising energy costs in the future.

Goal #7:
Measuring Performance – install consumption meters in individual suites

Status:
Each residential suite has a meter that measures cold water, hot water, heat and electrical consumption. The technology is provided by Victoria-based Reliable Controls.

Heat settings can be controlled remotely through the web-based platform. Heating can also be pre-programmed for a day or a holiday period.

Background:
Studies have shown that when individuals are given the ability to monitor their own water and energy use, they traditionally use up to 20% less than those who don't have access to a monitoring system. Other reports indicate that 30% of the occupants use 70% of the energy in a residential building.

Goal #8:
Energy Conservation (Energy Efficient Appliances) - provide Energy Star® rated appliances

Status:
Every appliance at Dockside Green is Energy Star® rated and have achieved **higher** performance over the base Energy Star® rating for certain appliances. For instance, front-loading clothes washers and dryers have been selected, which use less energy. These washers use the equivalent of less than a water cooler jug amount of water for every two loads.

Appliance	Standard	Dockside Green Ph1
Dishwasher	623 kWh/year/appliance	377 kWh/year/appliance
Refrigerator	527 kWh/year/appliance	476 kWh/year/appliance
Stove/Range	750 kWh/year/appliance	545 kWh/year/appliance
Clothes Washer	876 kWh/year/appliance	145 kWh/year/appliance
Clothes Dryer	909 kWh/year/appliance	340 kWh/year/appliance
Total per Suite	3,685 kWh/year/appliance	1,883 kWh/year/appliance

Goal #8:
Commissioning - independently commission each building to ensure building systems are installed correctly and working properly

Status:
An independent agent has commissioned all buildings on-site. The process includes review of the design and construction drawings followed by testing them upon building completion to ensure they work as intended.

The buildings are re-commissioned at the two-year anniversary of the building opening.

Background:
Commissioning identifies problems that would traditionally go undetected in buildings, allowing the problems to be addressed early on. Studies show that commissioning and verification can improve building efficiency and performance by 5 - 15%.

Goal #9:
Renewable Energy - demonstrate various renewable energy systems and environmental techniques

Status:
Various examples of photovoltaics and solar hot water products are used as demonstrations of renewable energy technology including the integrated photovoltaic shading strategy used on the first commercial phase, Inspiration.

Carmanah Technologies' street traffic signals and photovoltaic lighting products at the harbour ferry shelter have also been installed along with a solar compactor using photovoltaic technology.

Goal #10:
Elimination of CFC, Halons and Ozone Protection - avoid the use of CFCs (chlorofluorocarbons) and halons

Status:
Refrigeration units, HVAC systems and fire suppressants that do not contain halons have been installed.

Background: Halons and CFCs are harmful to the atmosphere and increase the rate of ozone depletion.

Sustainable Sites & Urban Ecology

Goal #11:
Green Roofs – install green roofs

Status:
Synergy, Balance, and Inspiration all have variations of green roofs.

Background:
Green roofs reduce the heat island effect of urban settings while promoting urban ecology. Other benefits include sound insulation, natural habitat for birds and insects, extend the life of the roof base, filter pollutants and carbon dioxide and can improve the aesthetic appeal from viewing platforms.

Goal #12:
Vertical Green Wall elements - introduce a vertical green wall element in the project

Status:
Two vertical green walls (or "living walls") were installed in Balance but have since been removed due to lack of plant growth.

Goal #13:
Use of Native and Adaptive Species - use only native and adaptive species in landscaping

Status:
All building and site landscaping include only native and adaptive species.

Goal #14:
Tree Planting and Site Landscaping - plant 1,000 trees throughout the development

Status:
Native or adaptive trees have and will continue to be planted in strategic positions throughout the site to reinforce the West Coast character of the project, provide shade from the sun in summer and wind breaks in winter, and attract birds. The trees planted (Synergy 60; Balance 81, CI-1 and CI-2 26) range from very small Japanese maples and Pacific crabapples to full-size canopy trees and berry trees. In addition, 47 trees have been planted along the greenway, 137 trees in Point Ellice Park and 7 trees on Esquimalt Road. In total, the planting of 358 trees has already been committed to, and it is expected the 1,000 tree goal will be met upon project completion.

There is also an old growth arbutus tree that was on-site prior to construction that will remain protected.

Goal #15
Integrated Pest Management Plan - develop and implement an integrated pest management plan

Status:
The plan is approved by the Municipality and is implemented.

Goal #16:
Erosion and Sedimentation Control - follow an erosion and sedimentation plan and during construction

Status:
An overall site erosion and sedimentation control plan was developed by Komex International Environmental and Water Resource Engineering and Aqua-tex Consulting. The plan conforms to the required standards and has been implemented on-site.

Goal #17
Rehabilitate Point Ellice Park Shoreline - rehabilitate the shoreline along Point Ellice Park

Status:
The park design was developed with input from a broad range of community members and other stakeholders, such as the Garry Oak Ecosystem Recovery Team, the Urban Agriculture Group, Natural Resources Canada and the City Environment and Shoreline Committee.

The park is complete and signage has been erected to showcase the various features along with a new pedestrian pathway.

A total of 137 trees have been planted in the park including oak, arbutus, and pine.

The project is also part of the Green Shore Initiative and is being used as a case example by that group (www.greenshores.ca). Green Shore is an initiative of the Stewardship Centre of BC to develop tools for sustainable coastal design and development, including a rating and certification

system for coastal development projects. The plan includes a new sand beach and tidal pool and native adaptive plant species.

Goal #18
Alternative Transportation Strategies

- Purchase vehicles for a car share program
- Provide car co-op stalls for commercial spaces
- Upgrade the Galloping Goose Trail
- Construct a dock for the Victoria Harbour Ferry
- Provide bike storage for residential and commercial space (include showers in commercial buildings)
- Work with BC Transit to add additional bus routes

Status:

- A Smart Car and a Honda Insight have been purchased for the car share program.
- Car share stalls are located in the parking loop off of Tyee Road between Synergy and Balance.
- The upgrade design of the Galloping Goose Trail has been completed along with the safe interface between the bike trail and Harbour Road.
- The completed total of 75 market affordable ownership suites will be provided with dollar subsidization by Dockside Green for bikes, transit and car share memberships.
- The construction of the dock facility is complete and Harbour Ferry service is active.
- Customized bike racks are installed. In Synergy and Balance, 99 and 171 (respectively) individual secure bicycle lockers have been provided in the underground parking for the safe storage of residents' bicycles. A shower is installed for the retail users in Synergy and 18 on-grade bike stalls have been set up for Synergy and Balance and 14 for the commercial buildings.
- A meeting took place to see if BC Transit would operate the mini-transit bus at Dockside Green Limited. BC Transit was not interested. Dockside will continue to investigate alternative operators. Discussions have also taken place with BC Transit to add bus routes to Dockside Green although BC Transit has decided not to change their existing routes.

Goal #19
Remediation - carry out the site remediation in accordance with the Ministry of Environment approvals including ensuring buildings in risk-assessed areas have proper vapour barriers and controls

Status:
Under the requirements of the AIP (Approval in Principle) provided by the Ministry of Environment, the removal of hazardous and contaminated materials from the site has been completed and Certificates of Compliance have been received on all parcels. It is noted in the 2011 Groundwater Monitoring report that one of the water wells had tested with levels higher than the compliance threshold, however upon further testing the values remain normal.

Human Health & Wellbeing

Goal #20
Fresh Air - provide 100% fresh air to residential suites

Status:
In Synergy and Balance, a central heat recovery ventilation system is in place which provides 100% fresh air directly into each residential suite. The system pumps fresh, filtered air into each suite and recovers heat in the exhausted air to help warm the incoming air.

Background:
According to the Canada Green Building Council, Canadians spend an average of 90% of their time indoors. The environmental movement has long been effective in focusing attention on the quality of air outside, but not in focusing on air quality inside. In fact levels of pollutants can be 2-5 times higher indoors than outside.

The causes of indoor air pollution vary with the main culprits tending to be ineffective or inadequate ventilation and the off-gassing of resins, adhesives, paints and other synthetic and organic polymers used to coat, seal or manufacture household furnishings and products.

Goal #21
Low or No VOC Emitting Materials Paints, Sealants and Adhesives - meet the LEED® requirements for providing low or no volatile organic compound (VOCs) in paints, sealants and adhesives

Status:
Paints, sealants and adhesives that meet strict low-emitting standards for VOC's have been used.

Goal #22
Non-Urea Formaldehyde Composite Wood Products - avoid using urea formaldehyde composite wood products

Status:
Wheat board substrates were used in residential cabinets and non-urea formaldehyde medium-density fiberboard was used in the suite as required.

Goal #23
Low emitting carpets - ensure all carpets meet the Carpet and Rug Institute's Green Label Indoor Air Quality Test Program

Status:
Carpets in all residential buildings meet Carpets and Rug Institute's Green Label program.

Goal #24
Indoor Chemical & Pollutant Source Control - install permanent systems at all high-volume entryways (e.g. grills and grates) to capture dirt and particulates preventing them from being tracked into buildings

Status:
Buildings have permanent entryway chemical and pollutant control systems.

Goal #25
Construction Indoor Air Quality Management Plans (during construction) - follow the LEED® requirements for instituting and following an Indoor Air Quality Plan during construction

Status:
An Indoor Air Quality Plan was prepared for all buildings and was followed which included protecting installed absorptive materials from moisture damage.

Goal #26
Construction Indoor Air Quality Management Plan (testing before occupancy) - follow the LEED® requirements for testing an Indoor Air Quality plan before occupancy

Status:
To ensure good indoor air quality in all suites, a contract was let to measure the following in Synergy and Balance:

Contaminant	Maximum Concentration
Particulate Matter (PM10)	50 ug/m3
Formaldehyde	50 parts per billion
Total Volatile Organic Compounds	500 ug/m3
Carbon Monoxide	9 PPM and no greater than 2 PPM above outdoors
4- Phenycyclohexene	6.5 ug/m3

The IAQ test performed in 10 units at Synergy all units are well within the allowable limits as demonstrated in the following table:

Contaminant	Maximum Concentration	Average Test Results for Synergy
Particulate Matter (PM10)	50 ug/m3	26.9 ug/m3
Formaldehyde	50 parts per billion	26 ppb
Total Volatile Organic Compounds	500 ug/m3	309 ug/m3
Carbon Monoxide	9 PPM and no greater than 2 PPM above outdoors	1.8 ug/m3
4- Phenycyclohexene	6.5 ug/m3	< 1 ug/m3

Goal #27:
Indoor Cleaning Products - promote the use of eco-friendly cleaning products

Status:
A Green Housekeeping Plan was prepared and a six-month supply of environmentally friendly cleaning products was provided to each resident and business upon occupancy.

Goal #28:
Smoking - meet the LEED® requirements for avoiding tobacco smoke in the building

Status:
Smoking is banned in all common areas inside the buildings doorways were installed to help ensure that unwanted odours and contaminants do not migrate from one suite to another. In addition, smoking is prohibited within 7.5 metres of all commercial buildings' doorways, windows and air intakes

Testing the effectiveness of sealing was done in Synergy during construction, which identified problem areas that required remedial action. This remedial action was undertaken and subsequent tests have shown compliance.

Background:
The testing and associated performance requirement, which is a prerequisite to achieve LEED® certification, proved problematic for multi-unit residential buildings. Dockside Green in collaboration with its design and construction team worked with the Canada Green Building Council to develop an acceptable procedure and implement the procedure through a detailed Environmental Tobacco Smoke Control design and construction plan.

Goal #29:
Controllability of Systems - meet LEED® requirements governing the installation of operable windows and lighting control zones

Status:
All commercial and residential buildings meet the LEED® requirements for operable windows and lighting controls.

Goal #30:
Thermal Comfort - comply with ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) 55-2004 requirements to meet thermal comfort conditions for human occupancy and provide monitoring systems for temperature control

Status:
All commercial and residential buildings meet the requirements. A four-pipe fan coil system is provided and residents have 100% fresh air systems and the means to control individual air flow and temperature.

Goal #31:
Noise Mitigation Strategies - ensure residential space does not exceed the following noise levels:

	Noise levels (decibels)
Bedrooms	35
Living, Dining	40
Kitchen, Bathrooms, Hallways	45

Status:
All residential spaces comply with the stated noise level maximums. Other noise abatement reduction strategies have also been used such as installation of acoustic underlay and sound insulation.

Materials & Resources

Goal #32:
Recycling Facilities - include recycling rooms in all buildings

Status:
In accordance with LEED® certification, a recycling space has been provided in all buildings to date. Residential buildings also include a carbon filter organics collector for each residential suite.

Background:
Buildings are major repositories for a wide variety of manufactured products. Building materials have an impact on the environment all the way through extraction, processing, transportation and eventual disposal.

During their life cycle they will contribute to air and water pollution, destruction of habitats and depletion of natural resources. According to the Canadian Green Building Council, the construction industry consumes approximately 40% of the global material flow and generates about 33% of the North American solid waste stream. That is why buildings have a significant “upstream” impact on demand for global natural resources and a significant “downstream” impact on land use.

To minimize Dockside Green’s building eco-footprint, the plan is for each building to use recycled content, sustainably harvested materials and rapidly renewable resources. At the same time, construction and household waste are minimized.

Goal #33:
Rapidly Renewable Products - use rapidly renewable natural materials

Status:
The following products have been used:

- Bamboo flooring and cabinet doors
- Wheat board substrates in cabinets
- Wool carpets (upgrade feature)
- Cork flooring and paneling in lobby areas

Goal #34:
Recycled Content - use environmentally friendly products with recycled content
Status:

- Fly ash: The manufacture of each tonne of Portland cement results in the production of .87 tonnes of CO2. Globally, 3% of greenhouse gas emissions and 5% of total CO2 emissions are attributed to cement production. EcoSmart Concrete, a national non-profit research and advocacy group, worked with Dockside Green to optimize the use of fly ash, a byproduct of coal-fired power generation and cement production. Adding fly ash to concrete reduces the overall amount of Portland cement needed. The 35–40% fly-ash content in our cement reduces the C02 level emitted and strengthens the concrete
- Interface carpet tile: Approximately 1,000 square metres of Interface carpet tile was used in corridors, lobbies and common areas. The tile is Interface's revolutionary 'Cool Carpet' which, thanks to the incorporation of recyclable materials, energy efficient manufacturing and use of alternative fuel sources, is a greenhouse gas neutral product. According to Interface Carpets Inc., the manufacturer of 'Cool Carpet', the Dockside Green community will save 14 metric tonnes of greenhouse gases by using the modular 'Cool Carpet'. Although the product is more expensive than rolled carpet, money is saved in the long-term. Worn or stained sections can be replaced by removing only the single tile instead of the whole roll as would be done with a traditional carpet. Carpets are one of the single largest components of North America's landfills. By using modular carpeting, the Dockside strata corporations will be able to maintain new-looking carpets without having to replace entire floor areas.
- Rebar with recycled steel
- Aluminum windows and railings with recycled content
- Terrazzo with post-customer recycled glass
- Recovered concrete crushed and used on-site
- Cork flooring, in the lobbies of Synergy, made from the materials left over from wine cork production

Goal #35:
Construction Waste Management - divert 75% of construction waste from landfill

Status:
A construction waste management plan has been implemented for each phase of the project. An average of 95% of construction waste has consequently been diverted from landfills.

Goal #36
Sustainable Wood - use sustainable wood products when possible

Status:
The Synergy townhouses incorporated Triton wood products. Thanks to a revolutionary underwater harvesting technology, which uses guided submersible tree fellers, we are able to use wood products from preserved trees submerged behind BC's large hydro-electric dams.

The technology is that of Victoria-based Triton Logging. Triton is the world leader in underwater logging and a growing player in the environmentally certified wood industry. Using its patented Sawfish™ technology, Triton harvests standing forests flooded by hydro reservoirs. With 45,000

major dam reservoirs around the world containing an estimated 300 million trees, submerged forests represent a significant source of non-living timber that can be used for a wide variety of industrial and consumer applications.

Background:
Certain logging practices have had significant negative impacts on ecosystems, fish stocks and biodiversity. Some solutions are to use Forest Stewardship Council certified wood (wood harvested from sustainable forests), reclaimed wood, forgotten wood or other sources of wood from using sustainable harvesting strategies.

Goal #37:
Cement - work with the Cement Association of Canada to maximize the sustainability of one of the principal materials used throughout the project and document the various environmental strategies with respect to the use of cement

Status:

- The condominium towers are constructed with a durable steel-reinforced, solid concrete structure of floor slabs, columns, sheer walls and roofs. Benefits include structural strength, noise reduction strategies, durability and adaptability. Durability results in longer lasting structures, reducing waste and maintenance costs over the life of the structure.
- Each mix incorporates industrial byproducts such as fly ash (a byproduct of coal-fired power generation and cement production), which is being used at a rate of 35–40% to replace cement. This reduces CO2 levels emitted during production of cement while using a waste product and strengthening the concrete.
- Fly ash was used in the construction of the sewage treatment plant. This resulted in a mix that had a high degree of crack resistance and water tightness thereby eliminating the use of chemical additives and saved about $40,000.
- We undertook a soil stabilization process using cement to “improve” the bearing capacity of inadequate soil conditions on which the biomass plant is being located by drying the soils and binding them, thereby providing increased capabilities avoiding unnecessary and expensive improvements such as floating, raft-slabs, piles or caissons.
- A cement-based solidification/stabilization process was also used to treat 10 tonnes of lead contaminated soil using Portland cement incorporated into the soil. The result achieved by an environmental consultant was non-hazardous soil. This strategy is now being promoted across Canada.
- Insulated concrete forms and a floor system were used to construct three townhouses on-site to showcase the benefits of the system.
- Any waste concrete from the site went back to Ocean Cement’s yard to be used to make lock blocks.
- Several buried slabs were found during excavation which were crushed and used for the road base and other building purposes.
- Concrete panels with recycled glass were used in elevator lobbies.

Background:
Concrete has many positive attributes including durability, design flexibility, sound proofing, inhibits mould growth, can be easily cleaned and the thermal mass of concrete contributes to the building’s energy efficiency.

Goal #38:
Building Moisture Protection - engage a building envelope specialist to ensure moisture protection

Status:
All buildings have rain screens to protect from unwanted moisture intrusion during wet weather events.

Goal #39:
Reuse Buildings - preserve existing buildings on the site

Status:
The site had two pre-existing structures; one was a concrete block building formerly used by Whitehall Industries and the other was the Princess Mary building, a former restaurant.

The one-storey Whitehall building was determined to have no economic or structural value and to be hindering future development that would have higher density. In addition, there was little embodied energy in the building and it was therefore deconstructed with the waste materials recycled as much as possible.

The Princess Mary building consisted of three structures: the stern of the old Princess Mary vessel, a Russian freighter and a two-story wood structure. The stern was salvaged and provided to the former owner of the vessel at no cost. Farmer Construction undertook a due diligence review and proposed to salvage what they could of the building and use it in the construction of their on-site head office.

Social Goals

Goal #40
LEED® for Neighborhood Design – obtain LEED® ND program status

Status:
Dockside Green was the first project to register for the LEED® for Neighborhood rating system. We were successfully selected as a pilot project and subsequently became the first project in North America to reach stage 2 of the certification process.

Background:
Although Dockside Green could be considered a community in itself, it is also part of a larger community. From the start Dockside Green has been committed to making sure that not only the buildings on the site are brought together into a neighborhood, but also that this neighborhood be connected and engaged with the larger region and the surrounding landscape.

The overall goal is to create a livable, sustainable community for people of all ages and income levels by working with the existing surrounding community to revitalize urban areas, preserve green spaces, reduce automobile dependency, promote pedestrian and bicycling activities and decrease polluted stormwater runoff.

Goal #41
Mixed-Use Development - create a mixed-use community using 'Smart Growth' principles

Status:
The principles of 'Smart Growth' are in effect with Dockside Green being able to house more than 2,200 residents on the 15-acre site. If the residents of this development were to be housed in single family dwellings, it would take a housing project of 115 acres; approximately 115 football fields of open space.

The master plan is continually being revised and improved based on input from the Community Association and the Municipal planning staff. For instance, Synergy and Balance have added more pedestrian connections. As well, Synergy has added some commercial uses near the Harbour Road and Tyee Road intersection.

Goal #42
New Urbanism Design - use new urbanism principles in the project design

Status:
The project design has embraced the principles of new urbanism. Both Synergy and Balance have created interesting streetscapes, bringing the building close to the street and creating landscaped "bulbs" for parking to narrow the street. Townhouses have been built along Tyee Road to create a friendly streetscape.

Goal #43
Mix of Residential Units - create a mix of unit types to attract a wide range of ages

Status:
Dockside Green is attracting residents of all ages and backgrounds who share a desire to live in a healthy, vibrant community. The project has been carefully designed as a mixed-use community to reinforce new urbanism principles including providing neighbourhood shopping, interconnectivity to surrounding neighbourhoods and numerous connected pathways.

The wide range of community amenities including parks and the dock facility, urban ecology practices, the greenway and access to waterfront are all factors that have attracted a diverse range of ages. Both Synergy and Balance include a varied mix of unit types (1 bedroom, 1 bedroom and den, 2 bedrooms, 2 bedrooms and den, and 3 bedrooms) in the form of condos, garden flats and two- and three-storey townhouses.

Synergy suite mix

Condo – market affordable ownership 1 bedroom	9
Condo – 1 bedroom or 1 bedroom/den	22
Condo – 2 bedroom or 2 bedroom/den	53
Condo – 3 bedroom	5
Townhouse – 3 bedroom	6
Commercial/retail	3

Balance suite mix

Condo – market affordable ownership studio	5
Condo – market affordable ownership 1 bedroom	12
Condo – studio	5
Condo – 1 bedroom or 1 bedroom/den	83
Condo – 2 bedroom or 2 bedroom/den	59
Townhouse – 1 bedroom	4
Townhouse – 2 bedroom/live-work	2

Goal #44:
Affordable Housing - provide a nominal fund for housing affordability initiatives

Status:
The Affordable Housing Strategy was created by the Dockside Green Housing Advisory Committee in 2006 and was submitted to the city as part of the requirements of the Master Development Agreement (MDA).

Market affordable ownership suites completed to date:

Phase 1 Synergy	9 suites	1 bedroom
Phase 2 Balance	5 suites	Studio
Phase 2 Balance	12 suites	1 bedroom

In 2009, Dockside signed a memorandum of understanding with the Capital Region Housing Corporation ("CRHC") to provide 46 units of non-market affordable rental units in two separate buildings. Under the agreement, CRHC would purchase the buildings from the developer for a fixed price with cost saving provisions. The developer would assume all construction risk and would develop and sell the buildings to CRHC at completion. The project was to be financed by contributions from the developer, CRHC, the City of Victoria, the Regional Housing Trust Fund and other sources. The 46 units included a mix of two and three bedroom family oriented designs and the goal was to be able to provide them to households earning between $35,000 and $47,000 per year. The Purchase and Sale and Development Agreements with the CRHC were never finalized.

We are continuing to work on finalizing plans that will satisfy the requirements as set out in the MDA.

Goal #45:
First Nations - work with First Nations to develop historical signage of their past connection to the lands and undertake a meaningful and thoughtful relationship with First Nations people.

Status:
A Memorandum of Understanding was signed with First Nations in October 2007. During the rezoning process several First Nations chiefs attended to celebrate the beginning of our relationship. During the ceremony we presented a written ecological pledge to be good stewards of the land.

Other initiatives that have taken place over the past 3 years are as follows:

- Artwork from First Nations artists was commissioned for manhole covers, path stones, site signage, and a totem pole
- Various on-site ceremonies with the First Nations people as guests have been held
- Historical photographs of First Nations involvement on the site have been included in on-site signage
- A First Nations job training program was developed

Goal #46
Encouraging a Sense of Connectedness - provide various pedestrian, cycle and vehicle connections and intersections and crossings.

Status:
The master plan continues to be refined, with connections being expanded to the neighbouring community. Improvements to date include the north/south greenway, numerous east/west pedestrian trails, a crossing on Tyee Road, a safe interface between the Galloping Goose Trail and Harbour Road and general upgrade of the Galloping Goose trail.

The greenway (north/south) creek system and trail has been designed and is approximately 50% complete. Design improvements on Tyee Road have been made to provide landscape bulbs and to slow traffic. The pedestrian feel of Tyee Road has been improved and enhanced by the addition of walk-up townhouses and the retail component at the corner of Harbour and Tyee Roads.

The plaza area and east/west connection have been completed at Synergy.

Consultation with the community has led to additional public corridors. For instance, in Balance a new trail has been added to the south of the buildings and a trail added along the Bay Street Bridge.

The re-design of the Galloping Goose Trail and a pedestrian cross-walk has been added at Tyee Road and are complete.

Outdoor seating at the bakery and coffee shop plaza is complete.

Goal #47:
Encouraging a Sense of Community - inspire a sense of community and establish a healthy working relationship with the local community association, environmental groups and the business community

Status:
We are happy with our relationships with the local community associations, in particular, the Vic West Community Association. They have been an integral part of our design team and their suggestions have improved our designs and enhanced marketability and livability.

The business community has also been very supportive of the development, as has the Chamber of Commerce. We are striving to support local business and BC technology companies.

A video of the development has been produced and includes positive comments from the Vic West Community Association, Sierra Club and Chamber of Commerce.

Staff of the municipality, Ministry of Environment and Capital Regional District has been very supportive of our innovative approaches and have proposed new strategies to enhance the triple bottom line elements of Dockside Green.

A sense of community is being cultivated and there has been a steady overwhelming acceptance expressed towards the development during the numerous rezoning, community and development permit meetings. We are committed to being open and transparent and to continuing to listen for new opportunities to improve the development.

Our goal is to create a model of how developers, municipalities and community, environment and business groups can work together to create sustainable developments.

Goal #48:
Public Amenities - provide the amenities that improve the livability of the development and the surrounding community, including:

- Public art
- Dock and small boat launch
- Upgrade of Galloping Goose Trail
- Sustainability centre (work with non-profit groups and commit $400,000)
- Historical and environmental education signage
- Main plaza, vista and triangle pathway, playground, staircase from the Johnson Street Bridge and public washrooms

Status:

- A First Nations totem pole has been commissioned and installed as well as the "Shatters" a glass sculpture installed in the Synergy plaza.
- Updates and modifications to the master plan have been completed to better facilitate the use of the north end of the site. The final plan, now built, has a water taxi connection, sufficient space for kayak, canoe or small boat launches, and enough area for pedestrians to walk about. Connecting to this small boat launch and to the rest of the Dockside site is the popular Galloping Goose Trail.
- A fitness centre is located in Synergy for residents and commercial tenants use.
- Approximately $100,000 has been spent investigating the creation of a sustainability centre. During 2008, several large non-profit organizations came forward expressing renewed interest in spearheading the planning and development of the Victoria Sustainability Centre. Presentations were made to these organizations early in 2009 however no consensus on the project has been reached.
- Significant educational signage has been placed to explore environmental First Nations' connections within the project.

Goal #49:
View Corridors and Open Space - continue to refine the master plan to improve view corridors and open space

Status:
As a result of consultations with the Vic West Community Association, the City Planning Department, and approval support from City Council, additional paths and view corridors have been added between buildings. In addition, the association's suggestion to develop townhouses along Tyee Road to improve the pedestrian feel of the street was implemented.

Goal #50:
Encouraging Innovations in Design and Sustainability - promote true triple bottom line results with clear communication of the challenges facing sustainability-focused developments

Status:
One of Dockside Green's initiatives from the beginning was to encourage similar types of development in the private and public sectors around the globe by sharing the lessons we have learned.

- We have met with developers and delegations from Victoria, across North America and around the globe. Teams from the Ukraine, Australia, Japan, Korea, Italy and China have visited Dockside Green.
- We have given numerous presentations on the project around the globe and locally.
- Dockside Green has also been featured in numerous industry magazines and newspapers.
- The project has been featured on "The Nature of Things" hosted by David Suzuki.
- A group of local professionals, with the facilitation of Dockside Green and Farmer Construction, meet on-site to study together to become LEED® accredited.
- Tours have been held for various government officials – from Natural Resources Canada, Public Works, National Defense, CMHC and various municipal governments from Canada and the U.S. (e.g., Bellingham, Campbell River, City of Vancouver, City of Calgary, Nelson, Nanaimo, UBCM, and FCM).

- We participated in the Green Shores program, in which the shoreline remediation of Point Ellice Park is being used as a case example (www.greenshores.ca) to create tools for sustainable coastal design and development.
    - The objectives of the Green Shores case example are to work with the shore design team to incorporate Green Shores principles into the shore remediation plan and apply the pilot Green Shores rating system to the final design plan. We work to identify any potential synergies and conflicts between Green Shores rating credits and LEED® Green Building rating credits.

Goal #51:
Educating Our Youth on Sustainability - engage in a program aimed at educating students about sustainability

Status:
Environmental posters were prepared by the Grade 4/5 class of Victoria West Elementary School for two years in a row. As part of the Grade 4 and 5 curriculums, students learn about sustainability issues and environmental stewardship. This was followed by a site tour of Dockside Green and then further research by the students. We have also made several other presentations to schools in the area and several university presentations.

A series of educational signs and brochures have been developed to create a self-guided tour of aspects of the poperty.

Goal #52:
Treating Our Workers with Respect - recognize the many men and women who work on-site in constructing our buildings and show our appreciation of their efforts, craftsmanship, quality work and enthusiasm for sustainability goals

Status:
As the development progresses workers will be treated to developer-hosted barbeques on a bi-annual occurrence where project gifts are shared with the on-site team. At one such event, members of the community association were also invited so they could meet the on-site team.

Economic Goals

Goal #53
Supporting Local Business - support local business by using and showcasing their products

Status

- Carmanah Technologies (Victoria, BC): providing site lighting, photovoltaic bus shelter and bus stop, traffic signage.
- Triton Logging (Sidney, BC): providing reclaimed wood from hydro-electric dams using Triton's underwater harvester.
- Reliable Controls (Victoria, BC): supplying each unit in Synergy and Balance with individually controlled meters that measure and record water, heat and electricity usage.
- Juneau Bros: providing exterior blind systems on the west and south windows of Synergy and Balance.
- Ocean Cement (Victoria, BC): The developer has worked with Ocean Cement to mix fly ash with cement to reduce CO2 emissions.
- Stone Designs: providing a glass-crete product for the elevator lobbies. All the materials have been salvaged from the downtown core of Victoria.

Goal #54
Supporting Innovative Environmental BC and Canadian Businesses - support a sustainable economy by focusing on using environmental technologies from British Columbia and Canadian companies

Status:

- Nexterra (BC): a biomass heat generation technology using waste wood.
- Sol-Air Systems (BC): an ultraviolet air decontamination technology for the sewage treatment facility.
- Zenon (Canadian): a sewage treatment process.
- Thermal Comfort (Canadian): a system that allows two of the pipes in a four-pipe fan coil to be the domestic hot and cold water supply.
- Delta (Canadian): quality bathroom and kitchen faucets and shower fixtures. In our experience, products made by Delta are some of the best-made and most durable faucets in the world.
- Quad Lock (BC): insulated concrete forms being used in three townhouses.
- HVAC Systems (BC): centralized heat recovery ventilators pump fresh air into each suite.

Goal #55
Support Local Employment and Post-Secondary Education - collaborate with local learning institutions to support education and training opportunities

Status:
Education

- University of Victoria's Integrated Management Masters program
- University of Victoria's speaker series on brownfield development
- University of Victoria's business class
- Royal Roads University's Environment Management and Environmental Science MA and MSc programs
- Canadian Public Relations Society (local chapter)
- Camosun College's Construction Management and Civil Tech program
- Pearson College's environmental program
- Numerous speeches on Dockside Green have been given locally, across North America and in Australia.
- BCIT Sustainable Business Leadership

Local Employment

- Many of the consultant teams have local offices
- Three co-op students have held positions at Dockside Green over the last two years with one student moving on to a full-time position.
- The biomass system and sewage treatment plant will created three new operator jobs.
- The First Nations Job Initiative resulted in 17 new jobs.

Tourism

- We have seen numerous groups visiting the city solely for the purpose of visiting Dockside Green.

Bio-diesel Facility

- We had agreed to build a bio-diesel facility and lease the building to Wise Energy on condition that the company completed its business case and arrange sufficient funding. Wise Energy has informed us it will not be proceeding with its plans to operate a facility because of economic and supply issues. So far, we have not been able to achieve this goal.

Goal #56
Limits Impacts on Municipal Infrastructure and Utilities (Sewer, Water, Storm, Roads and Landfill) - minimize impact on the municipal and the Capital Regional District infrastructure and utility costs

Status:
The development has succeeded in minimizing impacts on the municipal infrastructure in many ways and has been a catalyst for encouraging other developments to use some of our strategies.

Sewage

- Dockside Green does not be using the city sewage system except as a back-up measure related to unforeseen compliance matters with the treatment plant.

Water

- Dockside Green is expected to reduce potable water use because of the water-efficient appliances and the reuse of treated water from the sewage treatment process. In total, more than 70 million gallons of water will be saved annually on full build-out, the equivalent of the entire region's water use on the driest day of the year. In addition, the meters in each suite will measure hot and cold water use, which will also reduce water consumption due to greater usage awareness.

Stormwater

- Dockside Green does not use the municipal stormwater system.

Landfill

- Dockside Green produces less waste than typical developments, contributing positively to regional landfill costs.

Roads

- The various alternative transportation strategies ensure the development has less impact on traffic than a standard development, as confirmed by the traffic demand study prepared by the municipality.
- The car share program has reduced individual vehicle usage, while the Galloping Goose Trail, bicycle storage and shower facilities have increased bicycle usage.
- The car pooling and mini-transit will also result in a positive reduction in traffic.

Goal #57:
Economic Benefits to Residents and Business - offer residents and businesses protection against rising utility costs in the future by providing energy and water-efficient buildings with strategies that reduce ongoing maintenance costs

Status:
The water and energy efficiency of our buildings reduce ongoing operating costs to residents and businesses.

This approach also protects residents and businesses against rising utility costs. For instance, if utility costs increase by 5% per year, the impact on Dockside Green energy will be less because of the energy-efficient design. The compounded impact of this year over year saves significant dollars.

The installation of meters to measure hot water, cold water, heat and electricity in each residential unit and business provides immediate feedback on energy consumption. This leads to greater energy and water savings overall.

Concluding Remarks

Despite the achievement of a number of improvements and reaching a number of milestones this year there have been challenges in achieving some of our goals.

In 2010 and 2011, we slowed the pace of development, focusing instead on leasing and selling the existing inventory and ensuring that the needs of Dockside's residents are met. As of October 2011, all residential and commercial suites were sold out. Vancity remains committed to Dockside's financial, environmental and social vision and looks forward to the project's renewed progress as real estate markets improve.

We are committed to staying true to our vision of developing a sustainable community.