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THE trend

Special Edition – 2008

THE OFFICIAL NEWSLETTER OF RELIABLE CONTROLS® CORPORATION

Articles of Green

2008 AHR EXPO® INNOVATION AWARDS Value Impact Application Honorable Mention

BUILDING OPERATING management 2008 Readers' Choice Award

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BACnet Empowers Green Living

Step back over a century to the year 1889. The place is Victoria, the provincial capital of British Columbia. On the eastern shore of the inner harbour, the oldest city in Western Canada is turning 46 years old and the bustling streets clear a corridor for a new electric tramway. On the harbour's western shores, the lands adjacent to the water are home to a variety of interests, including a string of privately-owned shipyards, a marine hospital, and the sprawling Songees First Nations Reserve. The reserve is bisected by a commuter train chugging down the tracks toward downtown Victoria. What can be seen in this grainy portrait from the Victorian era is a scenario of mixed land use where residential and light industrial functions live side by side with the foreshadow of environmentalism in the form of a commuter train.

Jump forward more than a century to 2008 and the same fundamental relationship holds true on the banks of Victoria's western inner harbour. The native reserve has been relocated, some of the ships built in the shipyards have been moved into museums, and the train has been reduced to a one-car commuter. But a new development has risen from the remediated brownfields to garner international attention. It is called Dockside Green.

Built on 15-acres, Dockside Green is a 1.2 billion dollar development fast becoming a leading eco-residential and eco-industrial development, earning the world's first platinum LEED-ND (Neighborhood Development) certification. In all, twenty-four buildings at Dockside Green will pursue the LEED Platinum certification, an elite designation currently held by a handful of buildings in the world. As a model for green living, the Dockside Green community will exceed almost all of the current environmental performance standards for green buildings in Canada. And the Reliable Controls® MACH-System with BACnet® protocol plays a pivotal role in helping Dockside Green forge its path to sustainability.

Joe Van Belleghem holds Dockside Green's LEED Platinum certification award. The development set a world record for the highest score ever awarded to a LEED Platinum project.

The scope of the Dockside Green development spans 1.3 million square feet of mixed residential, office, retail, and light industrial space. When the community is complete in the later-half of the next decade, Dockside Green will already have made a strong impact on the international scene as a model for holistic design. The site's multi-use components will function as a total environmental system. Form, structure, materials, and mechanical and electrical systems will be interrelated and interdependent. The defining goal at Dockside Green is to be a self-sufficient, planned community, in fact, a net-zero energy use community where waste from one area will provide fuel for another. Innovative energy-saving measures abound throughout the development, including a centralized waste wood biomass gasification plant for providing clean, renewable heating; a dedicated onsite sewage treatment plant; a naturalized storm water treatment system; residential power metering; extensive onsite tree planting and green roofs; the use of environmentally friendly building materials like fly ash cement and cork, bamboo, and eco-carpet flooring; the birth of onsite parks and rejuvenation of shoreline habitat; and the incorporation of products from the bio-regional economy. Designs also include human elements such as an amphitheater, the development of an affordable housing strategy, a First Nations job training program, and the commissioning of First Nations art, including a grand totem pole. Eco-friendly transportation alternatives include a smart® car sharing program, mini-transit system, boat launch, bike trail, and dock facilities. When complete, green spaces punctuated by waterways and walking trails will carpet this sustainable community.

These bold initiatives have both the power-suit gang and the Berkinstock crowd seeing green, but how will the developers achieve this grand design? A robust *triple bottom line* development model was endorsed in which developers balance financial profits with environmental and social dividends. The term *triple bottom line* was originally coined by John Elkington in 1994 and was later expanded and articulated in his 1998 book, *Cannibals with Forks: the Triple Bottom Line of 21st Century Business*. According to Joe Van Belleghem, Development Manager for Dockside Green and founder of the Canada Green Building Council, "We wanted to demonstrate that it is possible for developers to embrace ecological regeneration and social principles in a development while being economically successful."

The BACnet® protocol is an important contributor to the triple-bottom line model employed at Dockside Green. It offers financial, sociological, and environmental returns. The financial return on investment of BACnet® is well-recognized with an open international standard that is extendable by the consensus of ASHRAE members and volunteers. By its very nature, BACnet® the Building Automation Control network protocol, monitors and controls building operational efficiency and comfort, and in doing so, pays an environmental dividend of reduced energy consumption and conservation of water. The rich diversity of objects, services, and networks within BACnet® delivers outstanding communication ability. This provides meaningful performance data to be quickly gathered, calculated, and communicated to the occupants so they can readily view the impact of their behavior, and in doing so, allow them to make healthy and informed choices.

The Reliable Controls® MACH-System installed in the development's first two phases, *Synergy* and *Balance*, have already begun to closely monitor and control each residential unit's environment and keep an account of the occupant's carbon footprint. In addition to local access within the individual suite, residences have web access to their suite's environment control system from anywhere around the world using the Internet. Communicating energy, water, and carbon consumption to each occupant is an important aspect of a sustainable community as it allows people to make informed choices when optimizing their carbon footprint.

A Natural Evolution: Cities of the Future

If we dare to look outside the recycling box and take a peek at where the green building movement is going, it is easy to see how green neighbourhood developments such as Dockside Green in Victoria, British Columbia are helping to foster a natural evolution toward green cities. And given the current climate in which dwindling energy resources mingle with innovative thinking, ground has already been broken on the green cities of tomorrow...

Masdar – Abu Dhabi – United Arab Emerates

www.masdaruae.com/text/broc-coll.aspx

Launched in 2007, Masdar is a 6 km² sustainable development that uses the traditional planning principals of a walled city, together with existing technologies, to achieve a carbon neutral and zero waste community. Masterplanned by British architects Foster + Partners, the initiative to build Masdar has been driven by the Abu Dhabi Future Energy Company in the hopes of providing a catalyst for the development of new ideas in energy production. This ambitious project has already attracted the highest levels of international expertise and commerce, providing a mixed-use, high-density city that will feature a new university, the Headquarters for Abu Dhabi's Future Energy Company, special economic zones, and an Innovation Center.

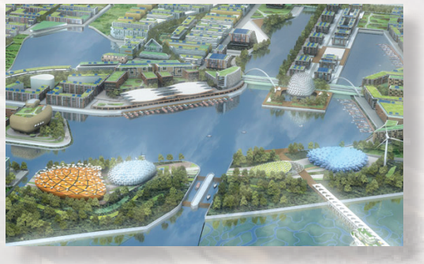
Borrowing on models from the past, Masdar will be developed as a dense walled city which will be constructed in an energy efficient two-stage phasing that will feature at its core, a large photovoltaic power plant. Strategically located near Abu Dhabi's transport infrastructure, Masdar will be linked to surrounding communities, as well as the center of Abu Dhabi and the international airport, by a network of existing roads and new rail and public transport routes.

To deliver on its carbon neutral ambition, the city will be car-free. With a maximum distance of 200 metres to the nearest transport link and amenities, the compact network of streets encourages walking and is complemented by a personalized rapid transport system. The shaded walkways and narrow streets will create a pedestrian-friendly environment in the heart of Abu Dhabi's extreme climate. Along with a carefully planned expansion, the surrounding land will contain wind, photovoltaic farms, research fields, and plantations, so that the city will be entirely self-sustaining.

visit www.reliablecontrols.com/greencities ... to learn more

Dongtan – Shanghai – China

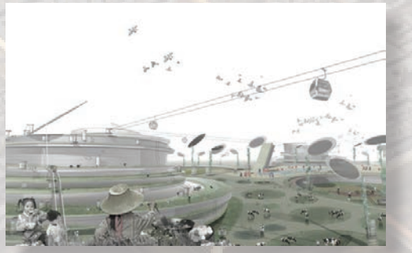
www.arup.com/eastasia/projects.cfm



Billed as the world's first eco-city, which will be sustainable not just environmentally, but also socially, economically, and culturally, Dongtan's goal is to create an urban development with low energy consumption that is as close to carbon neutral as possible.

Dongtan is located on the third largest island in China at the mouth of the Yangtze River. The 86 km² island is dominated by a wetland which will act as a buffer between the urban development and the natural world. Dongtan will produce its own energy from wind, solar, bio-fuel, and recycled city waste. Clean technologies such as hydrogen fuel cells will power public transport. A network of cycle and footpaths will help the city achieve close to zero vehicle emissions. Farmland within the Dongtan site will use organic farming methods to grow food. The city will consist of three villages, with the demonstrator phase for up to 10,000 people completed by 2010.

Guangming Smart-City – Shenzchen – China



www.ucl.ac.uk/news/news-articles/0703/07032301

Guangming Smart-City covers 8 km² near Shenzhen, China and provides a new urban topology beyond the conventional eco-city. The Smart-City is designed to provide housing for 200,000 inhabitants while continuing an agricultural tradition that runs deep in the surrounding territory. Plans call for lush grazing and arable land to be incorporated into the roofs of the huge circular towers that make up the city. Additional land for crops dispersed throughout the city will be made available on a series of eighty vertical farms in 10 m² allotments that will be cantilevered off a central spine and stacked one above the other like the branches of a giant tree. Housing will be arranged in human-scale clusters of housing/farming suburbs in the form of towers and craters with each suburb offering a self-sufficient, individual character. Sky-buses will provide a quick hop between urban centers, while in the center of the city, residents will be able to enjoy an artificial beach and a canal leading into the revitalized Maozhou River where a reed-bed water filtration system has recently been introduced. Existing lychee orchards will act as an air filter for the city.

LEED®
LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN

PROJECT PROFILES

1050 K Street

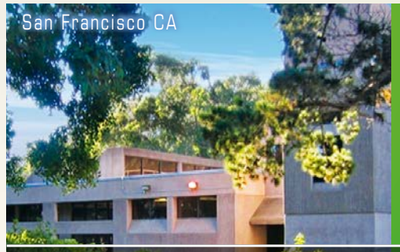
1050 K Street is a LEED™ Gold facility, which features the latest techniques in green design such as triple-scrubbed indoor air, power from wind energy, efficient water usage, and maximized use of daylight.

LEED: GOLD
Project Type: New Construction
Total Area: 12,633 m^2 (136,000 ft^2)
Total System Points: 1,075 points

San Ysidro DMV Field Office

The San Ysidro DMV Field Office is a LEED™-Gold certified building, the first new government structure in California erected to meet the construction benchmarks outlined in the state's Global Warming Solutions Act.

LEED: GOLD
Project Type: New Construction
Total Area: 14,636 m^2 (158,000 ft^2)
System Points: 1,800 points



Waldorf High School

Certified as LEED™ Gold, the Waldorf High School has achieved their goals by focusing on five categories of sustainable design: site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

LEED: GOLD
Project Type: Retrofit Construction
Total Area: 1,857m^2 (20,000 ft^2)
System Points: 150 points

Dockside Green

Dockside Green is a 1.2 billion dollar development earning the world's first platinum LEED™-ND (Neighborhood Development) certification. The site's first completed building broke the world record for the highest LEED™ point score.

LEED: PLATINUM
Project Type: Retrofit & New Construction
Total Area: 21,000 m^2 (226,042 ft^2)
occupied 120,000 m^2 (1,291,669 ft^2) total
Points To Date: 2,500 points

Burnside-Gorge Community Centre

Burnside-Gorge Community Centre was the first building in Victoria to be awarded LEED™ Platinum status. MACH-Stat™ controllers were installed to monitor energy usage and efficiencies.

LEED: PLATINUM
Project Type: New Construction
Total Area: 1,400 m^2 (15,061 ft^2)
System Points: 280

Discovery Education Centre

The Vancouver Aquarium is a LEED™ Gold project that uses the Reliable Controls® MACH-System™ to cool office areas with sea water, and regulate fresh water and salt water environments for the aquatic life.

LEED: GOLD
Project Type: Retrofit & New Construction
Total Area: 21,000 m^2 (226,042 ft^2)
120,000 m^2 (1,291,669 ft^2) total project
System Points To Date: 2,500 points

Heritage Woods Secondary School

As a LEED™ registered building, Heritage Woods incorporates many innovative and unique features that reduce energy consumption. Over half of the heating required for the ventilation air is provided by three heat recovery ventilators (HRVs).

LEED: SILVER
Project Type: New Construction
Total Area: 11,800 m^2 (127,000 ft^2)
Total System Points: 1,075 points

Kamloops Centre for Water Quality

The Reliable Controls® MACH-System™ installed at the Kamloops Centre for Water Quality helps the facility to produce clean, safe filtered drinking water for the city of Kamloops. The project is the largest facility of its kind in North America to use Zenon membrane treatment.

LEED: GOLD
Project Type: New Construction
Total Area: 38,100 m^2 (125,000 ft^2)
Total System Points: 352 points

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FOCUSING THE CARBON LENS

British Columbia Premier, Gordon Campbell, and Governor Arnold Schwarzenegger of California signing the Memorandum of Understanding (MOU) to fight global warming.

The *BC Energy Plan: A Vision for Clean Energy Leadership* puts British Columbia at the forefront of the fight against global warming with aggressive targets for net-zero greenhouse gas emissions, new investments in innovation, and an ambitious target to acquire 50 percent of BC Hydro's incremental resource needs through conservation by 2020.

To help achieve these ambitious goals, BC has become the first Canadian province to enshrine greenhouse-gas reduction targets in legislation. Bill 44, the Greenhouse Gas Reduction Targets Act mandates that the province's emissions be trimmed by 33 percent below current levels by 2020 – the toughest targets in North America. The law also calls for realistic, economically viable interim targets to be set by the end of 2008. And it mandates reduction of emissions by at least 80 percent below 2007 levels by 2050. The legislation also calls on government to produce a report every two years on its progress toward the targets which are designed by members of the Climate Action Team, an assembly of 22 leading environmentalists, research scientists, a recipient of the Nobel Peace-prize, students, accountants, and land developers. Bill 44 and other like-minded legislation in other jurisdictions have made a direct impact on the HVAC industry by requiring all government agencies including schools, colleges, universities, health authorities, and Crown corporations to be carbon neutral by 2010.

In 2007, Governor Arnold Schwarzenegger of California and Premier Gordon Campbell of British Columbia signed a Memorandum of Understanding (MOU) to fight global warming. The agreement outlines key actions that California and British Columbia will take to reduce greenhouse gas emissions and to build on the momentum established with BC's Greenhouse Gas Reduction Targets Act and California's Global Warming Solutions Act.

In 2006, Governor Schwarzenegger signed into law the Global Warming Solutions Act which places an economy-wide cap on greenhouse gas emissions and requires a reduction of emissions in California to 1990 levels by 2020. Administrative targets were also set to reduce greenhouse gas emissions in the state to 80 percent below 1990 levels by 2050.

Like BC's initiative to establish net-zero emissions from government facilities, California has been travelling on a similar road. In 2004's stated goal, Governor Schwarzenegger mandated that California's energy costs at state-owned buildings would be slashed by 20 percent by 2015, while encouraging companies, K-12 schools, and universities to embrace the same benchmarks. In 2006, he signed Executive Order S-17-06 which directs state agencies to begin implementation of the Global Warming Solutions Act. The first stop on this clean highway is the California Department of Motor Vehicles (DMV) San Ysidro field office which has been awarded a Leadership in Energy and Environmental Design (LEED) Gold Certification by the U.S. Green Building Council (USGBC) for meeting the necessary design, construction, and operation standards for a highly energy and resource-efficient facility.

DMV Director George Valverde called the LEED Gold Certification a landmark for the department. "We are absolutely committed to the *greening* of all of our facilities, be they newly constructed or retrofitted in some way. We want to lead the way in California with our environmentally-aware, can-do approach to managing our infrastructure. It's the right and smart thing to do," he said.

The 14,656 square-foot facility in San Diego County was conceived and constructed from the beginning to achieve LEED certification by utilizing the industry's latest, most innovative and environmentally-sound building technologies.

California Department of Motor Vehicles San Ysidro field office

The San Ysidro office features solar rooftop panels, glazed windows, energy efficient fluorescent and high pressure sodium lighting, and skylights to increase natural lighting and lower electricity, heating, and cooling costs. Fifty percent of the building's construction waste was recycled. And, all of the building's electricity costs have been offset by the purchase of wind energy through a two-year contract with 'Green-e' Renewable Certificates based on the building's estimated energy use. Reliable Controls® Authorized Dealer, L&H Airco of San Diego won the contract to install the VAV and CO_2 monitoring equipment which consists of 1 ETHER-Link™ portal, 1 MODBUS-Link™ portal, 2 MACH2™ controllers, 2 MACH2™ expansion cards, 1 MACH1™ controller, 3 MACH-Zone™ unitary controllers, and 20 MACH-Air™ VAV boxes.

It is little wonder that BC and California are pioneers in fighting global warming. Supernatural British Columbia is home to the Great Bear Rainforest, one of the largest remaining temperate rainforests in the world, and California is home to General Sherman, a 2,200 year-old giant sequoia tree weighing four million pounds and widely considered to be the largest organism on the planet, and Hyperion, another giant sequoia tree that is the tallest living thing on the planet, measuring 115.55 m (379.1 feet – that's 80 feet taller than the Statue of Liberty).

GREEN *OVER GREED*

In the wake of the current economic crisis, the green building movement has demonstrated a resilience that shows no signs of slowing down. This resilience stems in part from grass roots inertia and a growing desire to curb cost through demand side efficiency. According to Rick Fedrizzi, CEO, President and Founding Chair of the US Green Building Council, the green building movement originated from the desire of individuals to improve the world they inhabit. "Before there was a single government green building policy, before the business community stood up and took notice, before there was a LEED – there was you ... and every single one of us has a contribution to make towards pulling our country out of this crisis." In a recent open letter to members of the US Green Building Council, Rick predicts continued growth in the building automation market due in part to the increased drive to take what has been learned from the greening of new construction projects and applying the same treatments to retrofit projects.

To take the idea of individual environmental accountability to a higher level, municipalities are now boldly stepping up to the plate of green responsibility. At the end of September 2008, Reliable Controls® attended the Green Sustainable Building Controls conference in Dallas, Texas. Of particular note was the "Sustainablity in Dallas, Texas" session presented by Ms. Zaida Basora, who is a registered architect with over 20 years of experience in design, construction, and contracting. Working with the city council, she helped implement an Electric Energy Procurement Program for the City of Dallas in 2001, the LEED green building program in 2003, negotiated the City's first energy services contract in December of 2003, and participated in the Environmental Advisory Task Force. This led to the expedited implementation of the Building Inspection review process for LEED and Energy Star in 2004. She is currently implementing an Environmentally Preferred Procurement Program in her role as Assistant Director and Purchasing Agent for the Dallas Department of Business Development and Procurement. Through the efforts of Ms. Basora and the city council, Dallas is becoming a leading example of how the green movement has been embraced by municipal governments when state/provincial and federal governments have failed to act. In this manner, civic pride and common sense play major roles in fueling the green movement.

Dallas has embarked on an ambitious green program with an aim to claiming the title of "Greenest City in the US". The city's five-year old green building program has been made a top priority of the mayor's office and the Dallas city council. Although economic development remains the cornerstone of the Dallas green movement, Dallas has moved beyond "dollars saved" as the sole measuring stick of success, adopting the LEED standard for all city buildings over 10,000 square feet. As a result, the city of Dallas currently has 170 projects seeking LEED certification. In addition to LEED certification, Dallas has established a Green Building Task Force populated with members of the residential and commercial community to help Dallas become carbon neutral by 2030. To facilitate the move forward, milestones have been set – the first is to meet the US Mayors Climate Protection Agreement declaration to see a 7% reduction in Greenhouse Gas Emissions by 2012.

LEED™ BACnet® D S G™ supplier 5 year™ warranty

solutions for sustainability

Dockside Green
A 15 acre brownfield site transformed into the world's first LEED platinum certified neighbourhood development. (www.docksidegreen.com)

According to the US Green Building Council, CO2 emissions from buildings are predicted to grow faster than any other sector. Our Internet-connected building controls can help to reduce the carbon footprint of your building for the benefit of future generations.

We are the people and technology you can rely on.

www.reliablecontrols.com

Reliable® controls