Integrating plants into building design delivers perennial energy savings

Royal Botanical Gardens Atrium
Integrating plants into building design delivers perennial energy savings

LEED Canada for Existing Buildings
An agent of change for the city’s existing building stock

Harbourfront Centre prepares to shine
A world-first in sustainable design

PLUS!
Local News + Events + Green Homes Checklist!
As we welcome spring, we are pleased to share with you this third Toronto FOCUS supplement in partnership with SABMag. This year promises to be an inspirational one and this issue highlights upcoming exciting and unique events, projects, initiatives and technologies of the green building industry. The enclosed articles and features help us to understand the intricate and crucial connection of sustainable buildings to the environment, the economy, our well-being, and our communities.

This year, the Greater Toronto Chapter of the CaGBC is planning to extensively recognize, thank, and celebrate the numerous contributions of green buildings to the City of Toronto and Southern Ontario. We sincerely hope you join us at our Spring Open event at the end of April as we launch this year’s Green Doors Open in collaboration with the Clean Air Partnership, as well as our “Thank You” Campaign.

We are also looking forward to the CaGBC’s National Conference and Expo which will be taking place in Toronto in June. The theme of the conference is Beyond Buildings: The Green City which will bring together leading practitioners and decision-makers to generate meaningful discussions on how to make green cities a reality.

With so many things to look forward to and to take action on, we hope that you will join Greater Toronto Chapter members at our many and diverse networking events, tours, and education initiatives. We also want to thank you for your continuous support and participation.

Thank you as well to our Marketing and Communications Committee for their assistance with this issue as well as the efforts of our volunteers, members, partners and friends in developing and providing some of the content, and of course our sponsors and advertisers who have helped make this publication happen.

Please continue to share with us your projects, lessons, and successes as we strive to showcase the many inspiring stories of the green building sector. We hope you enjoy this Toronto FOCUS Publication and we look forward to seeing you soon!

The Greater Toronto Chapter Team
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ONTARIO GREEN POLICY HUB [OGPH]

This unique online searchable resource, of the most innovative and best practices implemented to promote and develop sustainable built environments by Ontario Municipalities, will be launched this spring.

Thank you to the following people for their contributions:

Barry Lachapelle (Spring Open ad, p.11)
Catherine Masson (The water issue article coordinator, p.24)
Jennifer Li (The Green Grind article support, p.8)

Thank you to our generous chapter sponsors:

LEED Canada for New Construction and Major Renovations
LEED Canada for Commercial Interiors
LEED Canada for Existing Buildings Operation and Maintenance
LEED Canada for Core and Shell Development
LEED Canada for Homes
LEED Canada for Neighborhood Development

Growth of LEED Canada [Total Certified Square Footage]

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Supporting LEED Canada, the Ontario Power Authority and the Chapter, the OGPH is a project of the Greater Toronto Chapter, generously supported by the Ontario Power Authority and the Chapter’s founding partner, the TRCA. This resource will be available on the Greater Toronto Chapter website, at upcoming sustainability conferences, and through links with various partners. Stay tuned!
We’re transforming the built environment.

Be a part of it.

Some of the benefits of being a CaGBC Greater Toronto Chapter member include:

- Savings at CaGBC National Conference
- Discounts on events & workshops
- Volunteer for CE Hours
- Complimentary magazine subscriptions
- Diverse networking opportunities
- Eligibility as a Board & Committee Member
- Chapter logo use & access to member-only resources
- Belonging to the transformation movement
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- Belonging to the transformation movement

To become a member, go to www.cagbctoronto.org

The Green Grind

The Green Grind, a café on College Street with an environmentally conscious mission, opened in 2009 and is LEED Canada for Commercial Interiors Gold certified. The Greater Toronto Chapter’s Chair Shawn Vanderheyden visited the café to present owner Becky Dooley with their LEED plaque and to thank her for her commitment to green buildings. We asked Becky a few questions to find out why it was important for her midsize business to certify. Here’s what she had to say...

We see institutions and large commercial buildings obtain LEED certification but rarely see small to midsize businesses seek certification. What was the top reason for this initiative for The Green Grind? Being as environmentally friendly as possible is at the core of The Green Grind philosophy. In order to stand out as genuine and trustworthy I felt it was necessary to ensure to my customers that my claims of being an environmentally friendly business are verified. Using a third-party certification system does that. Just as I buy certified organic and fair trade coffees and teas, I wanted the space to have that seal of approval as well.

What sustainable strategies has the café implemented? All take away cups, lids, cutlery, and straws are biodegradable, while plates and real cutlery and cups are used in the store to cut down waste, while all paper products are 100% recycled paper. Coffees, teas and juices, dairy, and baked goods are fair trade, organic, or locally sourced. There are many other proven interior design and fixture strategies that supported the many LEED credits as well.

What challenges does the café face in relation to practicing sustainability? The biggest challenge we face is higher cost. Construction and getting LEED came with increased capital cost. Ongoing operating costs are also higher. All of my inputs [organic baked goods, organic coffee, organic milk] are twice as expensive as conventional ingredients, and there is a ceiling to how much people will pay, which means smaller margins but it’s something that I believe in. It was worth it in the end.

What advice would you give to someone who is planning to seek LEED certification for their midsize business? Educate your customers on what green building is and why certification matters. Customers need to know what was done and why in order for it to be a competitive advantage.

This initiative was the first outreach effort of our emerging Thank You Campaign, where the Chapter thanks those who have chosen to build green. More information about this initiative will be available shortly on the Greater Toronto Chapter website.
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The Enwave Theatre was originally constructed in 1926 as an ice house where large blocks of ice intended for freight and cold storage were stored. The development of the theatre began in 1986, when the space was repurposed into a versatile 416-seat performance venue.

The theatre’s unique design features include a sleek, three-story glass envelope that surrounds the entire north, east and west sides of the facility, providing acoustic insulation, additional lobby space, and an aesthetic external finish that preserves the integrity of this historical building.

The glass envelope surrounding the Enwave Theatre recently reached the end of its lifetime and required replacement. Building-integrated photovoltaic [BIPV] technology, which involves embedding solar cells within two panes of glass, was incorporated into the solution, making a section of the new glass envelope capable of generating renewable energy.

Harbourfront Centre is prepared to shine

This spring, the Harbourfront Centre will launch what will prove to be a jewel in Ontario’s green building landscape. The Centre’s newly renovated Enwave Theatre will be a world-first in how it designs a major sustainability project in collaboration with a contemporary artist.

The Enwave Theatre provides a stunning example of how technology, a commitment to environmental sustainability and artistic creativity can be beautifully matched.

A series of artistic images and a collection of 360 photographs, compellingly documenting the history of Lake Ontario, were permanently embedded into the glass envelope which now generates electricity during daylight hours and is soon to be backlit with programmable, colour-changing LED lights at night.

The artistic elements were created overseas with airbrushed, fired enamels sandblasted on architectural glass. The photographic image gallery visible from within the building uses screen-printed photographs and dichroic glass.

This retrofit is generating a significant reduction in the building’s energy consumption, carbon production and cost of operation. In addition, the extreme heat gains and thermal transfer that were characteristic of the envelope’s performance have been dramatically reduced. The transformation of the Enwave Theatre provides a stunning example of how technology, a commitment to environmental sustainability and artistic creativity can be beautifully matched.
Office building landlords and tenants across the Toronto region are pledging publicly to work together to reduce their buildings’ energy use through a unique friendly competition called the Race to Reduce.

Launched in May, 2011 by CivicAction’s Greening Greater Toronto, the Race to Reduce has a collective goal of reducing the total energy use in participating buildings by at least 10% over four years.

The Race is open to office buildings of all types, sizes and ages throughout the region whose landlords and tenants are looking to save money and energy and be more competitive. The Race to Reduce also includes an annual awards component to recognize outstanding participation and engagement, innovative conservation measures and performance achievements.

With office buildings accounting for close to 20% of the region’s carbon emissions and 37% of its electricity consumption, the Race to Reduce is a tremendous opportunity for office buildings to implement environmentally sustainable practices in day-to-day operations to reduce carbon emissions and improve air quality in the region.

The Race to Reduce continues to make waves in the Toronto region as office buildings begin to see significant and measurable energy savings results from their collaborative efforts. The challenge will launch in Peel, York, Halton/Hamilton and Durham over the next year. For details or to enter your building into the Race to Reduce, visit www.racetoreduce.ca.
Royal Botanical Gardens Atrium

Balance of plant and human comfort delivers perennial energy savings

For the Royal Botanical Gardens (RBG) in Burlington, Ontario, ‘being green’ comes naturally. Renowned as a living, interactive museum filled with organic wonders and designated as a Natural Historic Site of Canada, it is situated among 1,100 hectares of breathtaking gardens and spectacular nature sanctuaries.

The addition of the new three-level, barrier-free Camilla and Peter Dalglish Atrium at the RBG, introduces a variety of functionally-aesthetic, innovative, and sustainable initiatives. Designed by Diamond Schmitt Architects and opened in 2009, it has subsequently achieved Leadership in Energy and Environmental Design (LEED) Gold Certification.

The picturesque and purposeful biofilter living wall creates a natural air purification system using rainwater captured from the roof, which also aids in supplying irrigation needs and water closets.

The facility is conditioned by a variable air volume displacement ventilation system with air-side heat recovery and hydronic in-slab heating. This highly energy-efficient HVAC system allows the temperature to stratify in the space while strictly maintaining thermal comfort conditions in the occupied areas.

Fully-retractable glazed walls and a glazed roof soften the distinction between the interior and exterior, encouraging visitors to interact with and experience nature in a setting that elicits panoramic views of the botanical gardens and the Niagara Escarpment.

Solar heating is actively and passively managed through a combination of motorized and fixed shading devices. The building makes use of an advanced lighting control system, including multi-level switching and dimming, occupancy and daylight sensors, and exterior lighting controlled by photocells.

Visitors to the RBG will have the opportunity to experience how the project has achieved a 40% reduction in municipal water usage, and how its energy consumption is approximately 63% less than comparable facilities. A model of innovation and efficiency, visitors will be challenged to look at the relationship between nature, humans, and building systems in a different light.

Michael Hunter, a partner at MCW Consultants Ltd., commented that, “It was a challenge to balance the environmental needs of the plants together with maintaining acceptable comfort conditions for the visiting public. Temperature and humidity levels had to be carefully controlled all year round in order to keep the required environmental conditions in balance.”

Hunter explains, “The living wall assisted this process by providing humidity control in winter and by naturally filtering the air all year round. This enabled us to reduce the amount of fresh air being introduced by the mechanical ventilation system which lowers the building energy consumption.”

Environmental Control System

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Green Profile

Green retrofits

By Bryce Conacher

Knowing what to throw away and knowing what to keep

I’m pretty sure Kenny Rogers isn’t thinking about green building retrofits when he sings that line, but the dilemma is the same for designers and card players alike: When you have the opportunity to trade up, how do you decide if something is valuable enough to hold onto?

One thing is certain: existing buildings need to be improved. Even if we could fully service all new construction in North America with renewable energy, the building sector would still be stuck with 98.5% of the problem as existing buildings gulp conventional energy with gross inefficiency.

But what do you improve? And by how much? Working from average benchmarks isn’t always helpful because every building is unique. A technology that works on one building won’t necessarily work on another. And a system that needs replacing on one building might be best left intact on another.

The secret to success is thinking like a developer, a builder, an engineer, an architect, and an owner all at the same time, and having access to as many ideas, products, processes, and technologies as possible. Solutions present themselves when you question the merit and potential of all building systems and then evaluate a suite of performance metrics across economic, environmental, and human factors.

At Ledcor Renew, we bring nearly 65 years of experience as one of Canada’s leading construction companies to our work on green building retrofits. We partner with forward thinking architects and engineers to find the best solution for every project. Collaboration is the key. When you’re all at the table together, every building comes out a winner.

Bryce Conacher works with Ledcor Renew, a division of the Ledcor Group of Companies that focuses on deep green retrofits, unleashing the potential for existing buildings to reduce energy, waste, and emissions while optimizing space utilization, water usage, and occupant health and comfort.
LEED Canada for Existing Buildings
by Mark Bessoudo

An Agent of Change for Toronto’s Existing Building Stock

The LEED Canada rating system has transformed the way buildings are designed and built. The popularity of LEED Canada for New Construction (LEED-NC) has soared, pushing the market to increasingly expect new buildings to be green.

But, since LEED initially focused on new buildings, two critical questions remained: How well do these new buildings actually perform? And how can we improve and benchmark the environmental performance of the existing building stock?

This is where LEED Canada for Existing Buildings: Operations & Maintenance (LEED-EBOM) comes into play. LEED-EBOM rewards buildings for demonstrating actual performance, not modelled or predicted performance. Buildings must re-certify at least every five years, encouraging property managers to monitor their building’s performance and set targets to continuously improve.

The success of LEED-EBOM has had tremendous impact on the green building industry, particularly in Toronto. While new high-profile LEED-certified office towers have sprung up in Toronto’s financial district, most of the area’s existing flagship buildings – including the Sun Life Centre, Royal Bank Plaza, TD Centre, First Canadian Place, and Commerce Court – have been busy improving their environmental performance and have either achieved or are pursuing LEED-EBOM certification.

LEED-EBOM now accounts for one-third of the GTA’s LEED-certified space. Within the City of Toronto, the square footage of LEED-EBOM certification surpassed LEED-NC certification (on a cumulative basis) for the first time in 2010, a trend that continued into 2011.

New Opportunities for Improving Performance of Existing Buildings

The most exciting possibilities emerging from the success of LEED-EBOM include: tenant engagement and the acceptance of universal energy performance metrics.

LEED-EBOM promotes tenant engagement in two ways: directly, through the commonly-pursued “Education Credit” (under the Innovation in Operations category), which actively engages occupants to understand their role in improving the performance of the building, and, more importantly, by helping landlords understand that achieving deep performance improvements requires the cooperation of building occupants.

A successful tenant engagement program can be a win-win: occupants who are more engaged help property managers achieve their building performance targets, and better buildings often are critical to tenant organizations meeting their own corporate social responsibility targets. Through tenant engagement we have found that building occupants share best practices with their neighbours, inspire each other to improve performance continuously, and see landlords as partners in their success. This can lead to a virtuous cycle of improvement within the building.

Using an accepted process for evaluating and comparing building energy performance simplifies benchmarking and managing for efficiency. This creates the opportunity for energy efficiency to more directly influence marketability, thereby rewarding those landlords with the best management practices.

LEED-EBOM uses the ENERGY STAR Portfolio Manager, an online tool for benchmarking a building’s energy performance. A Canadian version of ENERGY STAR for Buildings will be introduced in 2013. These are voluntary; however, there is a trend in the US, Australia, and Europe to require building owners to disclose energy performance in both lease and purchase/sale agreements.

Clearly, LEED-EBOM is levelling the playing field. Property managers of existing buildings now have a way of demonstrating to tenants that their building can perform as well as, if not better than, the new LEED-certified building down the street.

More importantly, LEED-EBOM has been instrumental in improving the performance of Toronto’s existing building stock, including some of its most prominent properties. It is also being used as a catalyst for change: instead of improving performance on an ad hoc basis, LEED-EBOM has provided a common framework to continuously improve performance for years to come.
When Toronto-based developer DCL Equity Partners set out to build Canada’s first sustainable healthcare facility, Enbridge Gas Distribution Inc. was one of the first partners to come on board.

The goal of DCL’s Stouffville Medical Centre project is to design, engineer and build an environmentally-friendly medical building that embraces the kind of green features that can contribute to health and wellbeing, and yet is also economically viable.

With Enbridge’s long-standing commitment to energy conservation and their new Savings by Design program – created to help commercial builders develop high performance buildings – it was a natural fit.

“The key to maximizing energy efficiencies and cost savings is to start with the design phase,” says Shannon Bertuzzi, Portfolio Manager at Enbridge. “That’s why we created Savings by Design.”

The DCL Stouffville Medical Centre is one of the first projects to participate in Enbridge’s new program, which offers support and financial incentives during the design, construction and commissioning stages of new commercial buildings.

The design stage begins with an integrated design charrette. Enbridge was one of the main sponsors of DCL’s Design Charrette and Workshop for the Stouffville Medical Centre, which was held on January 25. The charrette brought together experts in design, engineering, renewable energy and energy efficiency, along with some of Ontario’s senior healthcare executives, to identify the optimal mix of smart building design elements, green materials and processes, and advanced technologies.

“An integral part of the design process is energy modelling,” says Mary Harinck, Program Manager at Enbridge. “It’s used to estimate the project’s potential natural gas and electricity savings.” At the DCL charrette, the energy model used generated results 60% better than the current Ontario building code requirements. These results are consistent with BREEAM standards – one of the most widely recognized measures of a building’s performance. The Stouffville Medical Centre will be the first project in Canada to be certified under the BREEAM assessment method.

In addition to helping cover the cost of the design charrette, Enbridge’s Savings by Design program also offers financial incentives to help builders implement equipment and approaches identified during the design process. That’s good news for DCL as they begin the construction stage of the Stouffville Medical Centre this summer.

“Enbridge is very excited to be involved with this project,” says Mary Harinck. “We’re confident that it will demonstrate the value of investing in sustainable energy solutions upfront.”

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For more information please contact Erik.Rybak@hdsupply.com
The Water Issue

Though not typically seen as a Canadian issue, water access and management has become a serious challenge for many countries around the world. Consequently, we’ve been forced to look at our own water consumption and conservation practices. So where do we stand?

Studies say that Canada ranks 5th in total renewable freshwater supply - with 40x China’s supply per caput. Even so, 60% of our gross domestic product depends on the availability of safe, reliable water supplies and the sourcing, cleaning, distribution, heating, and disposal of water has a significant environmental impact. So it’s no surprise that water has been climbing higher on Canada’s sustainability agenda.

For this issue, we scanned the Canadian marketplace for some initiatives and technologies that are bringing water to centre stage. To read more about any of the below issues or for additional resources, visit our website http://tiny.cc/centre stage. To read more about any of the below issues or for additional resources, visit our website http://canadiangeographic.com/atlas/themes.ar


Water Efficient Irrigation

Despite all the focus on water and energy efficiency in the last number of years, it is still the case that many building owners and managers have no idea what portion of the water bill is attributed to landscape irrigation. Outdoor water is not metered. [5]

Greywater Management and Design Guide


Water Policy


Good Water Management

The Sherbourne Common project on Toronto’s waterfront is a first of its kind in Canada. It has successfully transformed an industrial area into a green space by integrating a stormwater treatment facility in its design at a neighbourhood scale. [8] http://www.toronto.ca/water/wastewater_treatment/treatment_plants/index.htm.

Residential Greywater Reuse


Urban Water Solutions


Grey refers to water consumed in landscaping and architectural design. Toronto’s City Hall now houses a green roof, as a demonstration of the City’s Green Roof bylaw. [5]

Black is waste water from sewage or other processes that requires treatment. Ashbridges Bay Water Treatment plant is one of four in Toronto. The City’s sewer system stretches for about 9,000 km. [7]

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Toronto’s RBC Centre, a 42-storey office tower located downtown, across from Roy Thomson Hall, was recently certified by the Canada Green Building Council as the Nation’s largest LEED for New Construction project. Built by PCL Constructors for the Cadillac Fairview Corporation, with RBC as the anchor tenant, this project added 1.4 million square-feet to the city’s growing portfolio of class ‘A’, high performance, occupant-friendly commercial space.

The tower is characterized by features such as state-of-the-art daylight harvesting systems, bomb-blast resistant design, operable windows and an under-floor air distribution system, all of which are integrated into a building that uses 43% less energy and 44% less water.

The planned goal to divert 75% of construction waste from landfill was exceeded by PCL’s sustainable construction processes which produced an 89% landfill diversion rate, recycling waste for secondary uses such as road bedding, plant mulch and waste-to-energy conversion. LEED Silver was originally the target for such a large project but PCL delivered LEED Gold Certification on schedule and at no additional cost. The abundance of daylight and accessibility to views, along with operable windows for fresh air and temperature control, are a few of the strategies that ensure building users remain comfortable, healthy, productive and safe inside this building. The RBC Centre has come to be known across Canada as a landmark for best practices in “how-to” deliver large-scale LEED projects.
Green Home Checklist

Buying a New Home?
What to look for when selecting your new house.

General
- If it is a newly constructed home, look for recognized green building labels like LEED® Canada for Homes, ENERGY STAR, EnerGuide, GreenHouse Certified Construction or R-2000 to ensure the house was built to perform above and beyond building code requirements.
- If buying an existing home, request an energy audit report by a certified evaluator from the homeowner.
- How big is the house? The best green homes have just enough space and no more!

Location
- Look for houses located in communities that offer many amenities at your doorstep. You will save money, gas and time!
- Is the house located in close proximity to your place of work? Can you walk to work? Is it near public transit? Is the neighbourhood cyclist and pedestrian friendly?

Water
- Are plumbing fixtures water-efficient? Does it have low volume or dual-flush toilets?
- Does the house have a tankless water heater solution?
- Is water waste or run-off water harvested and reused for non-potable uses? Is the outdoor environment landscaped to use irrigation water efficiently?

Energy
- Does it take advantage of any renewable energy technique?
- Does the house make good use of natural light?
- Are lighting fixtures energy-efficient and using compact fluorescent (CFL) or LED bulbs?
- Are the included standard fixtures and appliances Energy Star® compliant?
- Does the house have high-performance windows that prevent air leakage, eliminate moisture damage and provide better insulation?
- Look for high-efficiency furnace that will burn less fuel more efficiently, reducing both heating costs and GHG emissions.

Sustainable Materials
- Are the materials used in construction or finishing of the house such as cabinets, floors and furniture made from renewable resources? Do they have a high recycled content? Have the products been sourced locally?
- Is the wood used in the house FSC certified?

Indoor Environmental Quality
- Are the flooring, paint and other finishes non-toxic with low volatile organic compounds (VOCs)?
- Is the house equipped with Heat Recovery Ventilators which help control the moisture and humidity in the air?

Extras
- Does it have a garden to provide some food supply?
- Does it have a green roof?

Want to “green” your current house?
Try these solutions.

Water
- Conduct an energy audit to identify the best opportunities to save and improve your energy efficiency
- Insulate and air seal the attic, electric outlets, pot lights, basement and crawl space. About 20% of energy costs come from heat loss in those areas
- Install fireplace draft stoppers, attic door covers and dryer vent seals that open only when your dryer is in use
- Upgrade your furnace to a 90% or higher efficiency model
- Install a tankless hot water heater
- Keep doors and windows airtight by weather-stripping and caulking to avoid air leakage
- Install thermal drapes to decrease heat exchange through windows
- Replace existing light fixtures and bulbs with modern and energy-efficient compact fluorescent (CFL) and LED bulbs
- Take advantage of daylight harvesting, timers, dimmers and motion sensors
- Install ENERGY STAR® appliances where possible

Energy
- Install a Heat Recovery Ventilator and take advantage of fresher air inside the house
- Use a programmable thermostat to reduce energy costs when you are away or at night when you are sleeping
- Repair plumbing leaks and conserve water by selecting water-efficient plumbing products like faucets, shower heads and low-flow toilets
- Choose natural or sustainable flooring products like FSC-certified hardwood floors and non-off-gassing carpeting made from sustainable materials
- Consider buying green power from companies such as Bullfrog Power
- Become energy independent by installing a renewable energy system in your house such as solar photovoltaic system or a domestic solar hot water system
- Install an in-home energy display to display your energy usage
- When renovating, use recycled materials such as Ecopaints and other low-VOC materials
- Install a recycling centre in the kitchen
AWIP / Vicwest IMP Systems... how cool is that?

From sub-zero cold to dry heat or humidity, Mother Nature tests the very limits of building envelopes. AWIP / Vicwest Insulated Metal Panel Systems are engineered to maintain interior climate control, regardless of the weather. Plus, they allow for a one step pass around the building for faster installation and reduced labor costs. Available in various profiles, colors, sizes and finishes, AWIP / Vicwest Insulated Panels are the way of the future.
Many of Lambton Doors products can contribute to the calculation of points for projects pursuing LEED® certification. Visit Architect Space of our new 2012 Website to use our LEED® Calculator.

Lambton Doors develops, manufactures and sells high quality and value added interior wood doors and frames, of standard and ecological types, for the commercial, architectural and institutional markets.

The FSC® logo identifies products which contain wood from well-managed forests certified in accordance with the rules of the Forest Stewardship Council® A.C.

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