Sustainable construction
Preserving our future

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Getting started with PCL’s LEED® Accredited Professionals

Starting with the very first pursuit meeting, the PCL team working on the Manitoba Hydro project had the expertise of a LEED® Accredited Professional (LEED® AP) at its disposal. Randy Storoschuk, a PCL LEED® AP on the project from the beginning, says: “The work I put into receiving my LEED® accreditation paid huge rewards with my involvement in this project. I was able to analyze the project from a sustainable point of view through the entire process, providing our builders with the input they required to serve our customer.”

Randy is one of over 120 LEED® APs in the PCL family of companies … and, more than another 150 PCL employees are in the process of receiving this designation. No matter where you want to build your project, if you want to build it green, PCL can have a LEED® AP on the team.

Further to our commitment to building green at PCL, we now have managers of sustainable construction in both the United States and Canada. Read more about our sustainable construction managers and PCL’s LEED® Accreditation training program on pages ten and eleven of this Horizons.
The Integrated Design Process gets all participants on board

Early involvement by the PCL team and other participants in the design or preconstruction stage is the most important contributor to the realization of high-performance green buildings. PCL’s green design input or preconstruction processes around the organization include different combinations of charrettes, project charters, partnering sessions, and more. These groups typically involve all members of the project team — subcontractors, consultants, owners, operators, users, etc. — working together as a cohesive unit with all participants aware of each other’s unique interests. The participants also work together to hold each other accountable and on track to the agreed-upon project objectives.

PCL’s team makes recommendations early in the design or preconstruction stage to help guide all of the participants in making decisions on how to incorporate the best value to attain the desired result. These informed decisions become part of the design and construction methods for the project and help attain the desired level of certification.

Manitoba Hydro Place Integrated Design Process

On the Manitoba Hydro project, senior project manager Monique Buckberger says that the integrated design process initiated at the very beginning of the project is the key element to the project’s construction success: “To have all of the players at one table discussing all of the issues from constructability to cost to schedule led to a cohesive unit all moving forward with the same or similar understandings. It really was “our” building right from the beginning, meaning all of the participants took ownership in their contribution.”

Winnipeg’s brilliant green gem

Owner: Manitoba Hydro
Construction Manager: PCL Constructors Canada Inc. (Winnipeg)
Design Architect: Kuwabara Payne McKenna Blumberg Architects
Architect of Record: Smith Carter Architects & Engineers Inc.
Total Value of All Contracts: $278 million
Construction Schedule: March 2005 to March 2009
Increasing the “triple bottom line” through value management

Fundamental to our building green philosophy at PCL is paying attention to our customers’ social, environmental, and economic goals: the “triple bottom line.” We do this for our customers and we do it for ourselves.

Our professionals’ ability to connect with our customers to understand their goals in these three areas ensures our customers receive the end product they expect.

As for Manitoba Hydro Place, our professionals were involved with hundreds of sustainable value management considerations.

Some examples include:

**Saving heating and cooling dollars while improving air quality through airflow design**

Intense design processes between PCL, the consultant, and the mechanical contractor were undertaken to maximize the quality of the air on each floor and manage costs. The airflow was scrutinized according to economic implications to the project, how the airflow fit into the sustainability of the structure, and most importantly, how the airflow program would benefit the inhabitants of the building.

**Saving lighting dollars and maximizing natural light and productivity through floor design**

By including a haunch into the concrete slab design for each floor, PCL professionals minimized the floor-to-floor height and maximized the amount of daylight that can penetrate the building, creating a reduced need for artificial light and a healthier work environment, which will contribute to improved productivity.

**Saving energy and elevator trips by creating vertical neighborhoods**

The PCL project team was involved with an ingenious way of connecting groups of employees in related departments through the strategic use of staircases. The result: fewer elevator trips and convenient access for employees to meet with each other.

These three examples are amongst thousands of documented value considerations in the PCL family that our people have put together for our clients to consider when building green. Again, these considerations are tested against the economic, social, and environmental goals for the project.

In the end, Manitoba Hydro Place will offer stunning features like the South Atrium Waterfall, the South Atrium Staircase, a Solar Chimney, and the Gallery (the Gallery is accessible to the public).
Maximizing the triple bottom line by analyzing LEED® credits

As far as the LEED® certification process goes, PCL’s team helps decide upon and analyze each targeted LEED® credit by using sustainable value engineering practices, plus net present value and lifecycle costing comparisons. Our professionals know what it takes to achieve the various credits outlined in the LEED® green building rating systems issued by either the United States Green Building Council (USGBC) or Canada Green Building Council (CaGBC).

Procuring cost-effective sustainable products, solutions, processes, and subcontractors

Our construction professionals are continuously looking into and proposing sustainable solutions that reduce ongoing energy consumption for green projects. Our efforts at Manitoba Hydro Place included:

• Containment and minimization of construction impacts – a thorough plan was created to protect the surrounding environment from construction impacts. Part of the initial demolition plan included dust and noise minimization.
• Maximum diversion of waste from the landfill – our PCL team worked with all people working on the project to reuse and recycle more than 90% of the waste from the project.
• Sedimentation control – an innovative containment pond for runoff and groundwater filtration was created onsite by reusing precast traffic barriers.

Another service PCL offers across North America, and provided on the Manitoba Hydro project, is training in sustainable construction for subcontractors.

The LEED® scorecard and accurate documentation puts the green proof on paper

Our professionals are well versed in the documentation required to make a successful application for LEED® certification. Through the use of the LEED® scorecard and using best documentation practices from PCL’s extensive green portfolio, all of the data to ensure requirements are met (including photographs, inspections, and tracking sheets) are captured for eventual submission for certification. These documentation processes provide the necessary information to support the LEED® points targeted in the application for certification.

Submitting the LEED® application with success

Once the green project nears full completion, our customers can feel especially confident that the comprehensive documentation of the sustainable construction efforts and subsequent LEED® application is in good hands with PCL as the builder. Our track record with successful LEED® applications speaks for itself.

A snapshot of a few of the special features of the building:

• Living green roof on the podium level consisting of low vegetation like natural grasses reduces stormwater runoff, energy consumption, and the urban heat island effect and its associated cooling costs.
• Reflective roof coating on the tower roof reflects the sun’s heat in the summer, saving energy costs.
• The water feature in the South Atrium humidifies and dehumidifies the building. It consists of 280 strips of Mylar paper six millimeters wide suspended six stories from the South Atrium ceiling to the floor. Droplets of water continuously run down the strips.
Green really is our favorite color at PCL. Sustainability and the environment have always been important to the PCL family and, more and more, we are helping achieve our customers’ goals to go green. PCL companies across North America are quickly becoming renowned for their expertise in building projects to Leadership in Energy and Environmental Design (LEED®) standards.

PCL is ranked sixth in Engineering News-Record’s 2008 ranking of the Top 100 Green Contractors in the United States.

Cardel Place (Nose Creek Recreation & Library Facility) (LEED® Gold)
Calgary, Alberta
• Constructed as the first public sector LEED® Gold project in Alberta; however, it was not originally conceived as a LEED® project. PCL assisted with implementation of LEED® principles after it was decided during the late design and early construction phases to help pursue a LEED® rating.
• Achieved the highest waste management LEED® credit with over 75% landfill diversion. This level of recycling was not common at that time and required significant planning and coordination. When recyclables were accidentally tipped in the landfill by the waste management company, we were able to mitigate the impact by diverting a similar quantity of material from another PCL site.
• Supplied an in-house building systems coordinator to assist in the LEED® commissioning process.

Food Production Facility (working toward LEED® Gold)
Ottawa, Ontario
• Worked with client through a series of design charettes to upgrade from a potential LEED® Silver rating to LEED® Gold with minimal cost impact and no effect on the project schedule.
• Designed to obtain five out of five Water Efficiency LEED® credits.
• Installing a green roof, which will provide insulation, help with heat island effect, and be used to salvage rainwater for appropriate reuse in the facility (i.e. toilets).
• Diverting of waste from the landfill including eventual composting of organic waste by the client (a significant portion of total waste from this facility) will obtain Innovation in Design LEED® credit.

PCL is painting North America green

PCL Centennial Learning Centre (LEED® Gold) (PCL’s own training and professional development hub is the first private sector building in Alberta to achieve LEED® Gold status)
Edmonton, Alberta
• Applied special coatings to the window system allowing the sun’s warmth to pass through during the winter, while reflecting solar energy during the summer.
• Selectively illuminated areas throughout the building based on type and amount of use of each area, saving lighting costs.
• Installed an underground reservoir to reduce the use of chlorinated city water. Storm runoff from the garden is captured, stored, and used for irrigation during periods of low rainfall.
Mountain Equipment Co-op (working toward LEED® Gold and following the Living Building Challenge) Burlington, Ontario

- Installed onsite water cisterns, visible to the public, that collect and filter rain water for use as grey water in the toilets and for irrigation.
- Installing innovative, energy-saving technologies like solar arrays for power generation, off-peak generating ice chillers for cooling, hydronic radiant and in-slab heating systems.
- Diverting over 90% of the generated construction waste from the landfill.

Vancouver Convention Centre Expansion Project (working toward LEED® Gold) Vancouver, British Columbia

- Managed waste management through single-source carrier; excavation & demolition contractors sourced locations for reuse of materials.
- Implemented an indoor air quality (IAQ) plan during construction, including monitoring of humidity and temperature levels.
- Liaised with the Owner’s environmental consultant to minimize sedimentation of the marine environment below and surrounding the building.

Government of Canada Building (LEED® Gold) Regina, Saskatchewan

- Renovated and retrofitted existing lower levels and office tower following LEED® principles and practices.
- Managed and monitored dust and noise pollution to high standards as a portion of the lower floor of the building remained occupied during construction.
- Assisted in coordinating design and installation of environmentally conscious electrical and mechanical systems while keeping the tenant in the lower floor operational.
PCL is painting North America green

Seattle Terminal Radar Approach Control Center
(LEED® Gold) (White House Closing the Circle Award) Burien, Washington
• Constructed as the first LEED® Gold project for the Federal Aviation Administration.
• Worked with the customer through a series of design charrettes to upgrade from a potential LEED® Silver rating to a LEED® Gold rating with minimal cost impact and no effect on the project schedule.
• Achieved the highest waste management LEED® credit with over 95% landfill diversion.
• Attained LEED® innovation points for recycled material content attributed to the PCL team’s attention to detail.

Byron G. Rogers Federal Building and Courthouse
(LEED® Gold) (GSA 2007 Environmental Award and the Colorado Construction 2006 Gold Hard Hat award for outstanding sustainable design) Denver, Colorado
• Attained LEED® innovation points for recycled material content and VOC (Volatile Organic Compounds) documentation. Demonstrated large decreases in all VOCs.
• Involved mechanical, electrical, and fire protection subcontractors in LEED® documentation for recycled material content (they are typically trades that are excluded from LEED® documentation). All subcontractors were required to submit monthly recycled content worksheets.

Treepeople Center for Community Forestry
(LEED® Platinum) (Design Green Citation Award from the Architectural Foundation of Los Angeles) Los Angeles, California
• Built with new lumber from Forest Stewardship Council certified sources, materials demolished from the original buildings onsite, high fly ash concrete, waterless urinals, thermostat-controlled clerestory windows, and recycled cotton insulation.
• Installed a 216,000-gallon underground cistern to collect rainwater from the parking areas and roof. Benefits include convenient access for emergency crews during brush fire emergencies and solar power draws rainwater for irrigation and use at a nursery.
• Helped reach landfill diversion rates of 90% by separating waste off site and recycling.
• Reused formwork from another PCL jobsite reducing costs and waste.
Viceroy at Snowmass Village (working toward LEED® Silver) Snowmass, Colorado
• Established a unique gypsum board recycling program after gypsum board was refused by a local landfill’s recycling program. Gypsum board to be recycled is now being transported to an American Gypsum plant in proximity of the jobsite.
• Reducing water usage by 30% by installing low-flow lavatories, kitchen sink aerators, and dual-flush toilets.
• Utilizing certified Green Power for 35% of electricity use over the next two years minimally.

Ox Mountain Landfill Gas Facility
Half Moon Bay, California
• This facility built by PCL Industrial Services, Inc. (Bakersfield) will generate 11.5 megawatts of green electricity — enough power for average use of 7,500 homes.
• Landfill gas is produced when oxygen mixes with decomposing garbage. This gas is mainly made up of carbon dioxide and methane.
• The methane is captured and is used as the fuel in the generating station to create electricity.

Army Aviation Support Facility (LEED® Silver)
Buckley Air Force Base, Colorado
• Recycled the asphalt and subbase from the existing airport tarmac. The client reused it around the Air Force Base as needed.
• Recycled material from other runways and used it for the apron subbase.
• Reached 94% diversion from the landfill using these techniques.
Building green in the PCL family means building sustainable projects for our customers and building an environmentally conscious culture in the workplace. As we become more recognized as a leader in sustainable construction, it is only fitting that our employees embrace reducing, reusing, and recycling for our customers and for ourselves. It really is about building green, inside and out.

Leading by building a green “home”

At the turn of the century, talks began around our organization about how to best recognize our centennial anniversary in 2006. One hundred years of construction excellence was to be truly a historical milestone for the PCL family of companies, so why not do what we do best: build something.

The PCL Centennial Learning Centre, opened in June 2006 at our North American Headquarters in Edmonton, Alberta, was created to celebrate our anniversary and is a tribute to past, present, and future generations. And … it is green! It is the first private sector building ever in Alberta to achieve LEED® Gold status. This commitment, on behalf of the shareholders of the PCL family of companies, our employees, demonstrates that we really do believe in sustainability.

Social responsibility is one of our guiding principles

We encourage and support our employees in their desire to improve the quality of life in our communities.

• We are good corporate citizens.
• We are environmentally conscious.
• We are a contributing partner to the development of the construction industry through active involvement in its associations.

Moving forward with sustainability

We are aggressively expanding our leadership in education, training, and sharing our knowledge in sustainable building and environmentally sound business practices. We are adopting aggressive but attainable goals for recycling, employee incentive programs, energy conservation, and a number of environmentally conscious initiatives.

New leaders, initiatives, and green committees

We now have managers of sustainable construction in our US Head Office in Denver and in our PCL Constructors Canada Inc. office in Toronto.

We set up a Green Initiative Leadership Committee to formulate our green building strategy and carry the movement forward in our family of companies. Green District Committees have been subsequently set up in many of our major office locations with each committee having two “champions” as co-chairs working with our managers of sustainable construction. These committees are not only looking at ways to green our PCL offices, but are looking at greening our jobsites and building on the environmentally friendly volunteer opportunities that have been occurring at PCL for years.
PCL’s LEED® training program

We have rigorous in-house LEED® and Green Building formal and informal training programs available for our people to become LEED® Accredited.

Our formal program is led by PCL LEED® training champions who work in conjunction with our managers of sustainable construction. These leaders are responsible for ensuring the training programs are in place to increase the number of LEED® Accredited Professionals in the PCL family. They assist with formal training sessions and follow up with training participants through to accreditation. These champions make sure everyone who takes the test has ample study sessions, study guides, practice tests, and mentor the LEED® test takers. In some locations, we are even extending training opportunities to reach to our business partners. We have had owners and architects attend some of these training sessions. The formal PCL LEED® Accreditation training program consists of:

1. LEED/Green Building Training Session – this two-day intensive, in-depth training covers the USGBC, the LEED® rating system, and an introduction to Green Building.

2. Study Sessions – teleconferences/videoconferences are set up by the LEED® champions to help answer questions and review study points to prepare for the LEED® Accreditation exam.

3. Self-study – self-study helps participants understand the nuts and bolts of the LEED® system.

Our informal program rests on the commitment and dedication of some employees to receive their LEED® Accreditation through their own individualized processes or in small office groups they form on their own.

We now have over 120 LEED® Accredited Professionals in the PCL family of companies … and, more than another 150 PCL employees are in the process of receiving this designation. Our goal is to have more than 200 LEED APs in our organization in 2009.

Other PCL green programs

Green Building 201 is a monthly conference/videoconference call to continue green education with LEED® APs and training participants. Information is shared about the latest sustainable materials in the construction industry, new green building techniques, green practices for the home, and more.

All-hands Green Building and LEED® Presentation is an introduction to general sustainability and green building for all PCLers.

For more information, contact
Sarah Siegel in the US at (303) 365-6464 or
Shawn Vanderheyden in Canada at (905) 276-7600.
PCL FAMILY OF COMPANIES

Our operations are carried out by a number of independent companies which operate in different construction markets or geographic areas.

Buildings

Our full-service buildings operations support the work of project sites across North America. This network of construction professionals rises to the challenges associated with our extensive buildings portfolio, bringing added value to every commercial, institutional, educational, and residential project. While we’re better known for our larger projects such as airports, sports facilities, and office towers, we also excel at smaller unique projects such as renovations, restorations, and repairs.

Industrial

Our industrial companies, which are located strategically throughout North America, respond to the unique construction needs of our clients in the petrochemical, oil and gas, refining and oil sands, mining, and power and cogeneration industries. In addition to offering Construction Management services, we offer a full range of general contracting services, specializing in mechanical, civil, and electrical construction; pipe and vessel fabrication and module assembly; and piping and plant shutdowns/turnarounds.

Civil

By nature, civil work is geographically diverse and extremely demanding. This has made us versatile civil builders — equally at home, building on land or over water, in busy cities, or in remote areas. Our civil teams possess the ingenuity and the experience needed to undertake any civil structure imaginable — from bridges, overpasses, tunnels, and interchanges to water and wastewater facilities, pipelines, and light-rail transportation projects.