SNC·LAVALIN

Canada Pavilion

World Expo 2010 - Shanghai, China

Canadian Consulting Engineering Awards

category International

SNC-LAVALIN INC.
455, boul. René-Lévesque Ouest
Montréal (Québec)
Canada H2Z 1Z3

Téléphone: 514-393-1000
Télécopieur: 514-866-0795

April 29th, 2011

Mr. Bronwen Parsons, Editor
Canadian Consulting Engineer magazine
12 Concorde Place, Suite 800
Toronto, Ontario, M3C 4J2

Subject: **PARTICIPATON TO THE CANADIAN CONSULTING ENGINEERING AWARDS 2011**
Category: H – International

Dear Sir,

SNC-Lavalin Inc. is pleased to present its nomination document (complete Project Entry Binder) for the Canadian Consulting Engineering Awards 2011.

The government of Canada awarded the Design-Build-Operate-Maintain-Dismantle project of the Canada Pavilion for the World Exposition 2010 held in Shanghaï, China to SNC-Lavalin Inc. The realization of this project was made using an exclusively Chinese workforce and with the support of Chinese and Canadian engineers, architects and technicians.

The Canada Pavilion was a resounding success; it welcomed over 6 400 000 visitors and received high praise from the client, foreign governments as well as from the general public.

We would like to thank you for considering our nomination.

Yours truly,

SNC-LAVALIN INC.

Guy B...

For: Charles Chebl, Eng. M.A.Sc.
Senior Vice-President and General Manager
Buildings Group - Quebec

Encl.: 1 copy of the Project Entry Binder

a) Official Entry Form

CANADIAN CONSULTING engineer

PUBLISHED SINCE 1959
For Professional Engineers in Private Practice
FREE E-NEWSLETTER

ASSOCIATION OF CONSULTING ENGINEERING COMPANIES | CANADA
ASSOCIATION DES FIRMES D'INGÉNIEURS-CONSEILS | CANADA

OFFICIAL ENTRY FORM
Canadian Consulting Engineering Awards 2011

For other required documentation, see Information & Entry Rules at
www.canadianconsultingengineer.com

After completing this form, please print a copy and attach it to the front of your Project Entry Binder.

Please verify that the following information is correct, as it will be used for national publication purposes.

PROJECT INFORMATION

Project Name Canada Pavilion–Expo 2(
Location of Project Shanghai, China
Completed by December 2010
To be entered in Category H. International

ENTERING FIRM(S)

Firm Name(s) SNC-Lavalin Inc.
Firm Address
(including postal code) 455 Réné-Lévesque Blvd

Role in the Project Prime Consultant: Desigr
(i.e. prime consultant, mechanical subconsultant, etc.)

Member of the Association of Consulting Engineering Companies of Canada (ACEC)? Yes ◉ No ○

Project Leader SNC-Lavalin Inc.
P.Eng. ? Yes ◉ No ○

Contact Person Charles Chebl
Telephone Number 514-393-1112
Email Address charles.chebl@snclavalir

60 Word Summary of Project

This summary will be used for a video presentation and brochure for the Awards dinner. It is a good idea to use plain language to describe the nature of the project. You should also point out the project's benefits to society.

SNC-Lavalin successfully achieved the design, construction, operation and maintenance of the Canada Pavilion which welcomed a total of 6 400 000 visitors during the 2010 World Exposition in Shanghai, China. By providing a forum for trade, investment and educational programs, the Pavilion also fulfilled the client's objective of giving China and Canada the chance to deepen bilateral economic, diplomatic and cultural ties with each other.

Submit

QUESTIONS & CONTACT
Bronwen Parsons, Editor
Canadian Consulting Engineer
SUBMISSION DEADLINE: Tuesday, May 3, 5 p.m.Tel. 416-510-5119 / E-mail **bparsons@ccemag.com**

You have now entered this project. An acknowledgement will be sent. Do you wish to enter another project?
Click **here**

Incorrect syntax near 's'. Unclosed quotation mark after the character string ')'.

b) Entry Consent Form

CANADIAN CONSULTING engineer

ASSOCIATION OF CONSULTING ENGINEERING COMPANIES | CANADA
ASSOCIATION DES FIRMES D'INGÉNIEURS-CONSEILS | CANADA

ENTRY CONSENT FORM
CANADIAN CONSULTING ENGINEERING AWARDS 2011

INSTRUCTIONS

This Entry Consent form must be signed by someone from the entering firm(s) and also by the client and/or owner of the project.
The completed form must be attached at the front of the Project Entry Binder.

PROJECT NAME & LOCATION Canadian Pavilion - Expo 2010, Shanghai, China

1. TO BE COMPLETED BY AN INDIVIDUAL SIGNING ON BEHALF OF THE ENTERING COMPANY (COMPANIES)

I (We) confirm that this entry complies with the contest rules and that the information submitted is accurate.

I (We) also agree to accept as final the decision of the panel of jurors.

Name Charles Chebl

Position Senior Vice President and General Manager

Company SNC-Lavalin Inc.

Address 455, René-Lévesque Blvd. West

City Montreal Province Quebec Postal Code H2Z 1Z3

Tel. 514-393-8000, ext. 3352 E-mail charles.chebl@snclavalin.com

Signed Charles Chebl Date 23 mars 2011

2. TO BE COMPLETED BY PROJECT OWNER

I (We) agree with and support the entry of the above project into this awards program, and the release for publication of the information supplied.

Name Nicole Bourget

Position Assistant Deputy Minister

Company or Organization Department of Canadian Heritage

Address 25 Eddy St., 11th floor

City Gatineau Province Quebec Postal Code K1A 0M5

Tel. (819) 994-2164 E-mail nicole.bourget@pch.gc.ca

Signed N Bourget Date 23 mars 2011

CANADIAN CONSULTING engineer

ASSOCIATION OF CONSULTING ENGINEERING COMPANIES | CANADA
ASSOCIATION DES FIRMES D'INGÉNIEURS-CONSEILS | CANADA

ENTRY CONSENT FORM (continued)
Canadian Consulting Engineering Awards 2011

3. TO BE COMPLETED BY ENTERING FIRM'S CLIENT (If not the same as the Project Owner)

I (We) agree with and support the entry of the above project into this awards program, and the release for publication of the information supplied.

Name _____

Position _____

Company or Organization _____

Address _____

_____

City _____ Province _____ Postal Code _____

Tel. _____ E-mail _____

Signed _____ Date _____

4. TO BE COMPLETED BY ENTERING FIRM, PROJECT OWNER, ENTERING FIRM'S CLIENT

PERMISSION TO PUBLISH THE PROJECT ON CCE'S WEBSITE

After the awards have been announced, would you be willing to have Canadian Consulting Engineer magazine publish your entire Project Entry in an archive on its publicly accessible Web site www.canadianconsultingengineer.com? (Publication on this CCE archive would be for all entered projects, not just the winners.)

ENTERING FIRM	PROJECT OWNER	ENTERING FIRM'S CLIENT
☐ No ☐ Yes	☐ No ☑ Yes	☐ No ☐ Yes
Signed _____	Signed _____	Signed _____

PLEASE ATTACH THIS SIGNED FORM IN THE FRONT OF THE PROJECT ENTRY BINDER.

Send Project Entry Binders to:
Bronwen Parsons, Editor, Canadian Consulting Engineer,
12 Concorde Place, Suite 800,
Toronto, Ontario M3C 4J2
Tel. 416 510-5119, bparsons@ccemag.com
Fax 416 510-5134

PRINT

c) Page Project Highlights

Canada Pavilion – World Expo 2010, Shanghai, China
Consulting Engineering Awards 2011 - Category - H (International)

In 2008, the government of Canada awarded a contract to SNC-Lavalin for the design, construction, operation and maintenance of the Canada Pavilion for the 2010 World Exposition to be held in Shanghai, China.

Canada wanted to seize this opportunity to present the country's accomplishments and create innovative new partnerships among governments, the private sector and people from around the world. Expo 2010 also gave Canada the chance to deepen its bilateral economic, diplomatic and cultural ties with China, one of the fastest growing markets in the world and Canada's second-largest trading partner.

The **first phase** of the project consisted in the completion of the global design of the Pavilion jointly with the world-renowned Canadian entertainment company Cirque du Soleil, whose services had already been retained by the client to create the artistic concept of the Pavilion and provide the interactive exhibit and cultural program to be presented to visitors during the six-month duration of the 2010 Expo.

The **second phase** of the project consisted in the construction, operation, maintenance and dismantling of the Pavilion.

Completing the project required experience, adaptability and daring, combined with an excellent relationship with all stakeholders, including the government of Canada, Cirque du Soleil, the Expo Organizer (who managed the Expo site and its workforce of around 12,000 workers) as well as with Chinese authorities.

In addition, the very tight project schedule called for rigor and firmness in order to deliver the Pavilion on time and within the forecasted budget.

SNC-Lavalin's project team included a number of specialized Canadian and Chinese resources to design and build this complex facility. SNC-Lavalin succeeded in rendering most services required for this project locally, either at the construction site or within its neighbouring office in Shanghai.

In executing the Canada Pavilion project, SNC-Lavalin provided social and economic benefits to China and the local Shanghai region by generating work for the Chinese population and by purchasing Chinese goods and services. The Canada Pavilion also provided a forum for trade, investment and educational programs for the benefit of both China and Canada.

The organization put in place by SNC-Lavalin for the execution of this project made it possible to transfer skills to Chinese individuals, including SNC-Lavalin employees and construction workers retained by its subcontractors.

While integrating the work of such Chinese subcontractors and their workforce, SNC-Lavalin implemented extended training programs, rigorous construction procedures and strict monitoring requirements. Notably, by conducting mandatory training sessions and requiring standard safety equipment for all employees (boots, goggles, helmets, harnesses, etc.), SNC-Lavalin maintained an exemplary record in health and safety for all the Chinese workers assigned to the project. In all, 350 000 man-hours were spent working on the Canada Pavilion project, all without a single work-related accident.

During the entire project, particular emphasis was placed on designing and building an environment-friendly facility that met both Canadian and Chinese environmental performance indicators of sustainable development. The Pavilion featured a spectacular Canadian red cedar outer shell as well as eco-energy technology and practices to maximize the efficiency of the building. Strategies used to create an eco-energetic envelope included sun-breakers (louvers), a white roof membrane and a green wall to reduce urban heat islands.

The contract awarded to SNC-Lavalin comprised a vast array of technical and functional requirements. Analyses and studies were performed to optimize the structure as much as possible and three-dimensional models were used to visualize the desired end result. Furthermore, the Pavilion was designed according to both Canadian and Chinese codes, standards and regulations.

SNC-Lavalin maintained and operated the Pavilion during the 6-month duration of Expo 2010 (from May 1st to October 31st, 2010). During this period, an average 35 000 visitors/day enjoyed the multimedia interactive exhibit created by Cirque du Soleil as well as public presentations that showcased a number of Canadian artists and performers.

The Pavilion also comprised administrative offices and a VIP floor, the latter which served as a meeting place for dignitaries. A partnerships and trade events program held in the Pavilion provided an opportunity for business representatives and government officials to participate in bilateral discussions.

The Canada Pavilion was a resounding success; it welcomed over 6 400 000 visitors and received high praise from the client, the Expo Organizer, foreign governments as well as from the general public.

Moreover, the Pavilion was completed ahead of schedule and within the forecasted budget.

d) Full Project Description

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1. SUMMARY

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Moreover, the Pavilion was completed ahead of schedule and within the forecasted budget.

Visitors queuing to enter the Canada Pavilion

2. SOCIAL AND ECONOMIC IMPACT

In executing the Canada Pavilion project, SNC-Lavalin provided social and economic benefits to China and the local Shanghai region by:

- providing work to Chinese employees and subcontractors;
- purchasing Chinese goods and services;
- transferring expertise to the Chinese working community as a whole;
- providing a forum for trade, investment and educational programs.

2.1 PROVIDING WORK TO CHINESE EMPLOYEES AND SUBCONTRACTORS

The success of the project depended on the world-class quality, commitment and skills of the SNC-Lavalin team.

SNC-Lavalin's ability to use the best resources around the world is one of its strengths. The Shanghai based employees assigned to SNC-Lavalin's project team were involved in all aspects of the project, such as engineering, architecture, planning and cost control, procurement, contract administration and site management including with respect to health, safety and environmental issues.

Having in mind the various risks involved and the level of direct control needed to successfully achieve the project, and unlike most other international construction firms involved in Expo 2010, SNC-Lavalin opted for a business strategy whereby it implemented a "general contractor" project realization structure. This meant that SNC-Lavalin sequenced, planed and integrated the work of multiple specialized Chinese subcontractors, while controlling the overall project's progress, schedule, quality and budget.

SNC-Lavalin Chinese and Canadian employees

While this method increased SNC-Lavalin's control over the project's execution, it also required the hiring of several qualified individuals to be added to SNC-Lavalin's existing Chinese employees already working in Shanghai.

In addition to the hiring of Shanghai based employees to work on this project, SNC-Lavalin provided construction work and related training to the local labour force through the award of several construction contracts to Chinese subcontractors.

Subcontractors' Chinese workers

2.2 PURCHASING LOCAL GOODS AND SERVICES

Whenever possible, SNC-Lavalin encouraged the purchase of Chinese goods and services, therefore creating numerous direct and indirect jobs.

Contracts were awarded to many local suppliers including in the following fields:

- Supply and installation of structural steel;
- Supply and installation of curtain walls, aluminum doors and windows;
- Supply and installation of a roofing membrane and insulation;
- Supply and installation of prefabricated sandwich wall panels;
- Supply and installation of interior door frames, doors, locks and accessories;

Steel Structure

- Supply, installation and maintenance of an elevator;
- Supply, installation and maintenance of ventilation and air conditioning units;
- Supply, installation and maintenance of mechanical systems (including fire protection);
- Supply, installation and maintenance of electrical and telecommunications systems;
- Supply, installation and programming of a computer controlled architectural lighting system;
- Supply, installation and maintenance of a living wall ("green wall"), including an integrated watering system;
- Installation and maintenance of the tridimensional wooden architectural envelop made of certified Canadian Red Cedar;
- Supply and installation of commercial kitchen equipment (5 stars hotel type);
- Rental, transportation and installation of office furniture;
- Supply of on-site security services.

2.3 TRANSFERRING EXPERTISE TO THE CHINESE WORKING COMMUNITY

2.3.1 DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE EXPERTISE

An experience manager educated and trained in Canada headed the Canada Pavilion project and was transferred to Shanghai for the duration of the contract.

Such project manager and his Shanghai team members validated the design and oversaw the procurement and construction of the various work packages on site. Multidisciplinary meetings organized between the Montreal and Shanghai members of the project team were instrumental in ensuring coordination between the various work packages, addressing technical issues, executing, measuring, and making necessary adjustments.

To further ensure that the intentions and expected results of the concept were achieved, on-site visits were made by various Canadian engineers and architects during the construction of the Pavilion.

SNC-Lavalin set out to perform the design and construction work with the goal of providing superior quality services. To avoid design or construction rework, SNC-Lavalin set up a quality control system to ensure that all finished products and production phases met the required standards.

Chinese and Canadian engineers at work

The Canada Pavilion project provided the opportunity for SNC-Lavalin's local team in Shanghai to acquire and develop new expertise and talents, including the use of new or unusual execution methods, as well as techniques they seldom ever had the chance to experiment with first hand, all in their own backyard.

Despite such challenges, and through the knowledge and experience of its project team, SNC-Lavalin was able to recommend modifications to the project that were in the best interests of the client.

The Canada Pavilion project also happened to be the first SNC-Lavalin project involving building operation and maintenance activities performed in China and therefore yielded a new experience to its Chinese operations.

2.3.2 HEALTH, SAFETY AND ENVIRONMENT (HSE)

Health, Safety and Environment (HSE) are at the core values of SNC-Lavalin in every project it executes around the world. All SNC-Lavalin projects must follow the same strict HSE procedures and programs, and the Canada Pavilion was no exception.

Throughout the project, SNC-Lavalin was able to establish and communicate its HSE system to a workforce not used to working within such a system and in a country where HSE standards are not always enforced with the same intensity as in Canada or the rest of western world. To further help to put this into perspective, it is worth mentioning that three of the Canada Pavilion's close neighbours experienced workers casualties during construction activities.

Chinese Workforce

The implementation of SNC-Lavalin's HSE program on-site helped establish a direct bond with the local workforce and immediately produced related results such as better work cohesion, facilitated coordination and retention of the best and most talented elements. SNC-Lavalin's system made sure that every new worker, from his very first minute on site, was integrated into the Canada Pavilion team, and was made aware of

SNC-Lavalin's system, safety rules and of the rewards to be distributed among workers when the team's HSE objectives were attained.

This kind of direct recognition of the workforce's performance in HSE is not common in the construction industry in China, and to our knowledge, the Canada Pavilion was the only one which had an HSE system where measurable positive HSE results were rewarded in an organized manner.

The Expo Organizer soon noticed and recognized the value of SNC-Lavalin HSE management and cited the Canada Pavilion as an example to follow. The Expo Organizer even used the Canada Pavilion site as a showcase and invited many other countries' construction organizations to visit the site and exchange with SNC-Lavalin's team on the subject.

2.4 PROVIDING A FORUM FOR TRADE, INVESTMENT AND EDUCATIONAL PROGRAMS

Since China is one of the fastest growing markets in the world and Canada's second-largest trading partner, the resounding success of the Canada Pavilion has served to deepen bilateral ties between China and Canada. Participation in Expo 2010 has encouraged trade, the development of strategic corporate investment opportunities and educational programs in both countries.

During the 2010 Expo, the Canada Pavilion hosted the signing of contracts between Canadian and Chinese companies involved in fibre optic, green technology, architecture and entertainment.

VIP Floor Meeting Venues

International Trade Minister Peter Van Loan and Federal Finance Minister Jim Flaherty visited the Pavilion during a four-day trade visit to China, which featured meetings with several Chinese government officials, including Gang Wan, China's Minister of Science and Technology, and Xuedong Ma, China's vice-minister of commerce.

Also, whereas SNC-Lavalin has been active in China for several decades with respect to providing professional consulting services, the Canada Pavilion project was the first construction project it achieved in this region and this accomplishment will serve as a springboard for future projects of this nature.

In October 2010, SNC-Lavalin received the 2010 Member of the year (Gold Medal) Award from the Canada China Business Council (CCBC) recognizing that the Canada Pavilion project resulted in commercial success and clearly distinguished itself from its competitors. Upon presenting this award to SNC-Lavalin, the CCBC commented: "*SNC-Lavalin's path-breaking work in the design and construction of the Canada Pavilion for Shanghai World Expo 2010 resulted in a project delivered on time and on budget. The judges felt it was an artistic success and technological triumph in simultaneous engineering, real time, by managers in Canada and engineering and service teams in Shanghai*".


CANADA CHINA BUSINESS
EXCELLENCE AWARDS

1970
2010

Member of the Year Award
Gold Award

Presented to

SNC-Lavalin International Inc.

In recognition of the bold elements and accomplishments of the company's project, and
Their significant contributions to the firm's growth and business model.
The project has differentiated the company from the competitors in the industry.

Peter Kruyt
Chairman

Peter Harder
President

Sarah Kutulakos
Executive Director

October 13, 2010
Beijing, People's Republic of China

CCBC Award Ceremony

3. TECHNOLOGY TRANSFER

3.1 INTRODUCTION

Construction of the Canada Pavilion was made using an exclusively Chinese workforce and with the support of Chinese and Canadian engineers, architects and technicians.

The organizational structure of the project team made it possible to:

- Support local employment;
- Profit from the experience of Chinese employees;
- Transfer skills and provide training to Chinese individuals, including SNC-Lavalin employees and construction workers retained by its subcontractors.

The construction of the Expo site with its national self-built pavilions brought to Shanghai the World's best and most performing engineering and construction organizations for what can be described as "the Olympics of design and construction".

On numerous occasions, the Canada Pavilion team was recognized by the Expo Organizer as a leader and a key player. SNC-Lavalin played an active role in demonstrating and transferring Canadian know-how to the Chinese community in such a unique endeavour.

3.2 SNC-LAVALIN EMPLOYEES

SNC-Lavalin is very proud of the fact that almost all the services required for this project were performed in Shanghai, by a team who coordinated the entire project, from engineering design to shop drawings, from purchasing to inspection, from project management to site management.

SNC-Lavalin Shanghai project team

The "general contractor" approach adopted by SNC-Lavalin for this project required the hiring of additional resources to complement its existing Shanghai field office personnel in order to properly oversee the project's progress, schedule, safety, quality and budget.

Although applicants with good educational backgrounds were available in Shanghai, the majority had no concrete experience in the carrying out of a construction project for a Canadian company, especially in the context of western world quality requirements.

The strategy used by SNC-Lavalin involved the development of numerous skills by its employees based in Shanghai. As a result of the rapprochement between its Canadian and Chinese employees during the course of this project, the Canadian SNC-Lavalin manager in charge of the Canada Pavilion even decided to pursue his career in China once the project was completed.

The SNC-Lavalin Chinese employees assigned to the project acquired valuable experience in several fields, including:

- Engineering optimization and value engineering;
- Planning and cost control;
- Procurement management;
- Quality control at all phases of the project;
- Environmental protection;
- Health and Safety at work;
- Building operation and maintenance.

The project provided the opportunity for SNC-Lavalin Chinese employees to further develop their technical knowledge in several areas such as architecture, structure, mechanical (amongst other, fire protection) and electrical engineering, security and telecommunications. It also gave them the chance to gain experience with new or unusual execution methods, as well as with techniques they seldom had a chance to experiment with first hand.

Expo 2010 gave SNC-Lavalin's Chinese team members the opportunity to compete with the best companies in the world in a unique and highly motivating (but friendly) adventure.

3.3 CONSTRUCTION WORKFORCE

While integrating the work of several Chinese subcontractors and their workforce, SNC-Lavalin implemented extended training programs, rigorous construction procedures and strict monitoring requirements.

Notably, by conducting mandatory health, safety and environment (HSE) training sessions and requiring standard safety equipment for all employees (boots, goggles, helmets, harnesses, etc.), SNC-Lavalin maintained an exemplary record for all the Chinese workers assigned to the project.

Health, Safety and Environment (HSE) Recognition Events

HSE objectives and progress were pre-eminently displayed on the construction site. For each 50 000 man-hours worked without an accident, recognition was systematically provided. Workers were therefore continuously motivated to achieve the next HSE benchmark which in itself, was quite a novelty for workers in China and happened to be unique at the 2010 Expo construction site. In all, 350 000 man-hours were spent working on the Canada Pavilion project, all without a single work-related accident.

The pride felt by Chinese workers assigned to the Canada Pavilion became known to fellow construction workers assigned to other pavilions within the 2010 Expo site. As a result, several competing project teams ended up copying SNC-Lavalin's HSE incentives and recognition policy within their own work site.

Furthermore, the Expo Organizer cited SNC-Lavalin's HSE management as an example to follow and incited several other project teams to visit the Canada Pavilion construction site and enquire on the subject.

Recognition for Excellent Work

4. ENVIRONMENTAL IMPACT

SNC-Lavalin's environmental policy outlines its belief that sustainable development can only be achieved through the respectful use of natural resources. As part of this commitment, SNC-Lavalin ensures that all of its activities comply with applicable environmental laws and regulations. Throughout this project, both Chinese and Canadian requirements were taken into account, as well as environmental performance indicators provided by the client and the Expo Organizer. The project was thus developed and completed with great concern for quality and a view toward sustainable development.

Throughout the Canada Pavilion project, emphasis was put towards preventing pollution, promoting indoor energy environmental quality (thermal comfort, air quality, maximising daylight/sunlight) and site conservation. Also, the reuse or recovery of materials was prioritized in deciding which materials and construction methods to select in order to reduce waste.

Living or Green Wall

The steel-framed building was designed for energy efficiency, employing glass and aluminum curtain walls. About 4 000 square metres of Canadian red cedar was used to create the outer shell of the building envelope which incorporated sun-shielding shutters to reduce thermal gain in the building. The cedar boards were individually fastened to the steel frame, which will allow the wood to be easily dismantled and re-used in other construction projects in the future.

The walls of the courtyard where the public presentations were held were covered by a 15 by 40 metre living wall composed of evergreen seedlings designed to cool the Pavilion and filter air.

Another green feature of the building was the use of a reflective white membrane roof.

Furthermore, a waste management and recycling program was established and maintained during the construction of the Pavilion as well as for the 6-month duration of Expo 2010.

Whenever feasible, local materials were used in order to avoid transportation as much as possible. For instance, steel was widely used in the construction since it was readily available through local suppliers.

White Membrane Roof

When possible, the rental of furniture and decorations was preferred to the manufacture and purchase of new materials. In addition, easy maintenance materials and furniture (environment friendly) were chosen for the construction of the Pavilion.

The "Oriental Morning Post" awarded Canada with an Expo Oscar for having developed the most ecological green space amongst the 2010 Expo participants.

5. COMPLEXITY

5.1 INTRODUCTION

Completing the Canada Pavilion project required experience and adaptability. In realizing this project, SNC-Lavalin had to take into account the local environment and maintain excellent relationships with several organizations.

In addition, a very tight project schedule called for rigor and firmness in order to respect the deadline.

Moreover, the contract awarded to SNC-Lavalin comprised a vast array of technical and functional requirements in order to convey the particular artistic concept of Cirque du Soleil and fulfill other client demands.

5.2 LOCAL ENVIRONMENT

Having been present in China since the seventies, SNC-Lavalin benefited from the knowledge and experience of its existing Shanghai office employees in taking into account local factors (different culture and customs, business practices, language, geotechnical and weather conditions, etc.) in the development of the concept in order to ensure its successful execution.

The Pavilion was designed according to both Canadian and Chinese codes, standards and regulations (the most stringent was applied on every occasion). The concept was developed to achieve the objectives of the project as well as in accordance with the different construction methods familiar to local construction companies.

SNC-Lavalin understood and integrated the work methods prevailing in China and utilized them efficiently in order to deliver the expected results in respect of the quality standards of its client, the Canadian government.

5.3 PARTIES INVOLVED

The project's success can be attributed to several factors including the professionalism and imagination of the design and management team who was able to provide the client and other interested parties a final product that lived up to their expectations.

The parties involved included:

1. the client, which was represented by three entities: Canadian Heritage, Foreign Affairs, as well as Public Works and Government Services Canada;
2. the world-renowned Canadian show business company Cirque du Soleil in charge of the artistic concept, the interactive exhibit and cultural program of the Canadian Pavilion, along with its animation; and
3. the Expo Organizer and its technical office, overseeing the construction of more than 200 pavilions on the Expo site.

SNC-Lavalin's role was to bring to life the Pavilion while respecting the Cirque du Soleil's artistic concept, the client's technical and functional requirements, the Expo regulations, the Chinese and Canadian building codes, the budget and the tight schedule.

In order to accomplish the project, SNC-Lavalin organized a wide range of coordination meetings with the parties involved. In addition, SNC-Lavalin awarded and managed several subcontracts to successfully complete the project.

5.4 SCHEDULE

One of the project's challenges was the tight schedule. The contract was awarded in May 2008(with the artistic concept 20% complete) and the Expo opening was scheduled for May 1st, 2010.

In order to meet the deadline, the building and its various components had to be designed at the same time, by different resources. Since the schedule did not allow construction to wait for the completion of the design, SNC-Lavalin executed the project in fast track mode.

The chosen project team organization allowed SNC-Lavalin to rapidly deploy in the field a management entity with western style methods, tools and reporting systems capable of operating the site using Mandarin as the prime communication language and using field operations techniques familiar to Chinese subcontractors.

Having SNC-Lavalin's management team rapidly in place and establishing clear communication channels with its subcontractors proved to be a key factor of success.

Having project team members present both in Canada and China also turned out to be an advantage as the design work literally progressed "24/24" on both sides of the planet alternatively.

Construction began before the design was completed and some areas of the Pavilion were built while the design of other areas was still in progress.

The project was divided into several packages of procurement and of construction. Several contracts were awarded at the same time to different Chinese subcontractors.

SNC-Lavalin prepared a master schedule and controlled work package sequencing. Milestone dates were included in contracts and the subcontractors were required to prepare their own detailed schedules in accordance with strict requirements set forth by SNC-Lavalin.

SNC-Lavalin then integrated all the individual subcontractor work package schedules. This allowed SNC-Lavalin to measure the impact, at any time, of any construction schedule slippage in a particular work package onto another work package, and to take corrective actions in a timely manner.

Close coordination, state of the art collaboration tools and perfect alignment of everyone's objectives enabled SNC-Lavalin to successfully manage the project schedule.

5.5 PROCUREMENT AND CONTRACT MANAGEMENT

Given the number of procurement packages, and the number of contracts awarded to different subcontractors that overlapped in time, extra attention was focused on procurement and

contract management. The team in charge of preparing and managing the tenders, as well as the site contract administration team, had to overcome several challenges.

SNC-Lavalin adapted its management of various subcontracts depending on which solution was best adapted to the work at hand. Proceeding in this manner enabled SNC-Lavalin to control and reduce the risks associated with execution of the construction work. It should be noted that no unsettled claims remained at the conclusion of the project, thus confirming SNC-Lavalin's proactive attitude in matters of contract administration.

5.6 TECHNICAL AND FUNCTIONAL REQUIREMENTS

5.6.1 GENERAL

In order to convey the artistic concept, several requirements were incorporated in the design, including accessibility, signage, lighting orientation and acoustic insulation.

Located in Expo Zone C, in the Pudong district along the Huangpu River, the 6,000-square-meter Canada Pavilion was among the largest on the Expo site.

The visitors' entrance to the Pavilion was an open-air square that circulated through a larger structure where the covered queuing area and the interactive exhibit were located. The Pavilion comprised a few restricted access areas, namely administrative offices and a VIP floor. The exterior envelope of the Pavilion was composed of 4,000 m² of Canadian red cedar. Each cedar triangulation was individually cut, trimmed and fastened on site.

Throughout the project the architectural, structural, mechanical and electrical (amongst other, fire protection) requirements as well as security issues, telecommunications and environmental concerns were thoroughly taken into account. SNC-Lavalin provided the key personnel and worked in close cooperation with the client, the Expo 2010 Organizer as well as Cirque du Soleil in order to ensure the successful execution of the project.

5.6.2 FOUNDATIONS

The Expo site having previously been used as an industrial zone, the risk of encountering underground obstacles was significant. Whereas other project teams designed their pavilions with the use of piles and were slowed down when encountering obstacles, SNC-Lavalin opted for shallow foundations (raft, slab and sole types).

5.6.3 ARCHITECTURAL RED CEDAR ENVELOPE

The outer building envelope of the Pavilion was meant to evoke the precious character of Canada's natural resources. It also had to be spectacular and capture the imagination.

In order not to hinder in any way the design and construction of the outer shell, SNC-Lavalin chose to build a second and independent inner waterproof envelope within which the rest of the Pavilion construction work could proceed.

The construction of the exterior envelope required the development of a design and structural support system. In addition, a computer controlled architectural lighting system designed to enhance the Pavilion's distinctive outer envelope required the installation of specially adapted lighting fixtures.

Several SNC-Lavalin engineering specialists had to analyze the Cirque du Soleil's artistic concept requirements in order to prepare the construction documents. Three-dimensional models were used to make it easier to visualize the desired end result for the outer shell. Analyses and studies were necessary to lighten the structures as much as possible and produce the desired aesthetic effect. Determining the optimum number of component parts in the overall structure was a key factor in being able to meet project assembly deadlines.

Architectural Red Cedar Envelope

The Pavilion's exterior lighting had to highlight both the structure and its overall shape. To achieve the desired effect, direct and indirect lighting was used. Lighting requirements established by the Expo Organizer also had to be taken into account, particularly the requirement that all of the lighting fixtures had to be located exclusively on the Canada Pavilion plot of land. To avoid light pollution, the lighting planned for the area surrounding the Pavilion had to be taken into account as well. After several models were studied, the selected model consisted of recessed spotlights and light fixtures anchored to the Pavilion.

SNC-Lavalin designed and successfully executed this tridimensional back lighted cladding constructed with sustainable harvested Canadian red cedar which became the signature of the Canada Pavilion.

6. MEETING AND EXCEEDING CLIENT NEEDS

6.1 OVERWHELMING RECOGNITION

The government of Canada wanted to dazzle the public with a dynamic and memorable Pavilion and give the Chinese and international visitors a favourable, lasting impression of Canada as a democratic, culturally diverse, technologically advanced, environmentally aware and bilingual country. The Canada Pavilion designed and constructed by SNC-Lavalin proved to be a resounding success. It exceeded the client's hopes and expectations and received excellent reviews from numerous other sources.

Visit from Canadian Prime Minister Stephen Harper

The client representatives repeatedly expressed their great satisfaction with the pavilion in all aspects, from its spectacular red cedar exterior to its outstanding level of comfort and functionality, including with respect to the enjoyment of the interactive exhibit put together by Cirque du Soleil and the various public presentations.

Visit from former Governor General Michaëlle Jean

The Pavilion benefited from high media exposure throughout the 2010 Expo and was visited by many personalities, among them the Canadian Prime Minister, the Governor General, several Cabinet Members, CEOs and many other high ranking officials.

The Canada Pavilion welcomed an excess of 6 400 000 individuals throughout the 2010 Expo and thus became one of the top ten pavilions visited by the public. It was also voted as one of the top five most appreciated pavilions.

"The Expo Organizer" magazine and the Chinese daily economic paper "Diyi Caijing Ribao" bestowed the Canada Pavilion with the "Most Commercially Valuable" award.

The Canada Pavilion project was also honoured with three (3) other awards of merit:

- the 2010 Member of the Year Gold Medal Award given by the Canada China Business Council (CCBC);

- the 2011 Léonard Award – international project, bestowed by the Association des ingénieurs-conseils du Québec (the Association of Professional Engineers of Quebec or AICQ); and
- the 2011 Wood Design Award for "Best Design, using Western Red Cedar" by the Canadian Wood Council.

SNC-Lavalin was also invited to present the Canada Pavilion project to audiences convened by McGill University, by the Montreal Chinese Chamber of Commerce and by the Chinese Media Group.

6.2 SCHEDULE

Meeting the deadline for this project was imperative. Challenges in this respect included the time-consuming approval process inherent to the rules governing the client's operations, the approval process of the Expo Organizer and that of the Chinese authorities.

In order to meet such deadline, SNC-Lavalin mobilized the resources needed to begin project activities as soon as the contract was awarded and immediately put in place a comprehensive and efficient organization to manage all aspects of the project.

Concurrently, SNC-Lavalin organized the first of several coordination meetings with the Canadian government and the Cirque du Soleil to ensure that execution of the project would respect the artistic concept and other client requirements. A joint mission to Shanghai was also arranged with the client very early on in order to meet with the Expo Organizer and ensure that its requirements were well understood and taken into account in the design development of the Pavilion.

SNC-Lavalin took great care in informing the client of the project's progress every step of the way. The project schedule and project-specific procedures always allowed for client validation of the project's progress.

2011 AICQ Leonard Awards Ceremony

The project team members in Shanghai worked in close cooperation with their colleagues in Montreal to meet the client needs. Always keeping in mind the deadline for the opening of the 2010 Expo, the technical team optimized the design in order to respect Cirque du Soleil's artistic concept and deliver the Pavilion in accordance with the client's technical and functional requirements, those of the Expo Organizer as well as with the approval of the Chinese authorities.

Despite all of these constraints, the Pavilion was completed ahead of schedule and the client was able to welcome the first visitor on the Expo's scheduled opening date, whereas 25% of the other pavilions were not yet completed.

6.3 BUDGET

During the course of the project, SNC-Lavalin had to incorporate significant modifications to the design of the Pavilion in order to bring to life the artistic concept created by the Cirque du Soleil while respecting the forecasted budget.

Through several imaginative modifications, SNC-Lavalin was able to successfully overcome this challenge without compromising the schedule.

With respect to the construction activities, SNC-Lavalin's chosen business strategy whereby it took on the role of general contractor allowed it to control the Pavilion’s costs, and therefore to complete the project within the forecasted budget.

APPENDIX
DISCOVERY OF A UNIQUE PROJECT

CONSTRUCTION

SNC·LAVALIN

Construction
a story of People, Synergy and Safety
March 2009-April 2010






OPENING CEREMONY

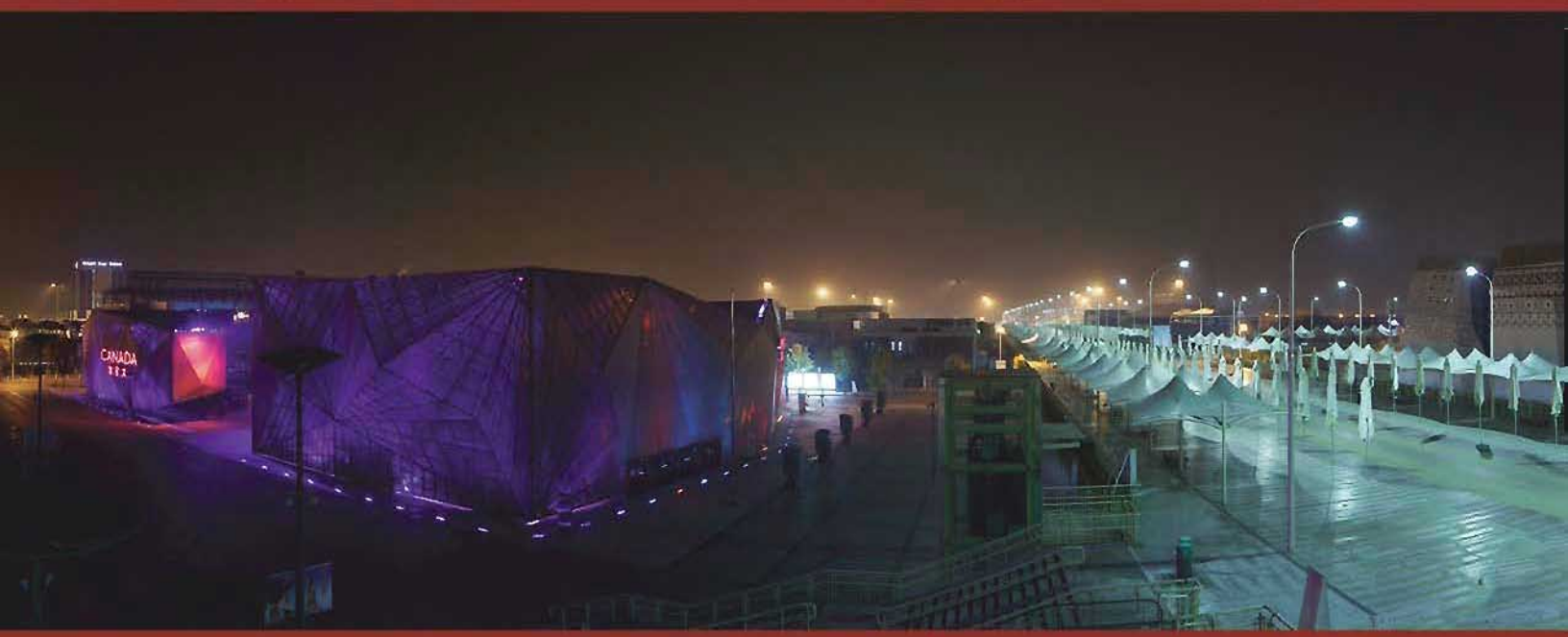
SNC·LAVALIN

Official Opening of the Pavilion - May 1st 2010


CANADA
加拿大

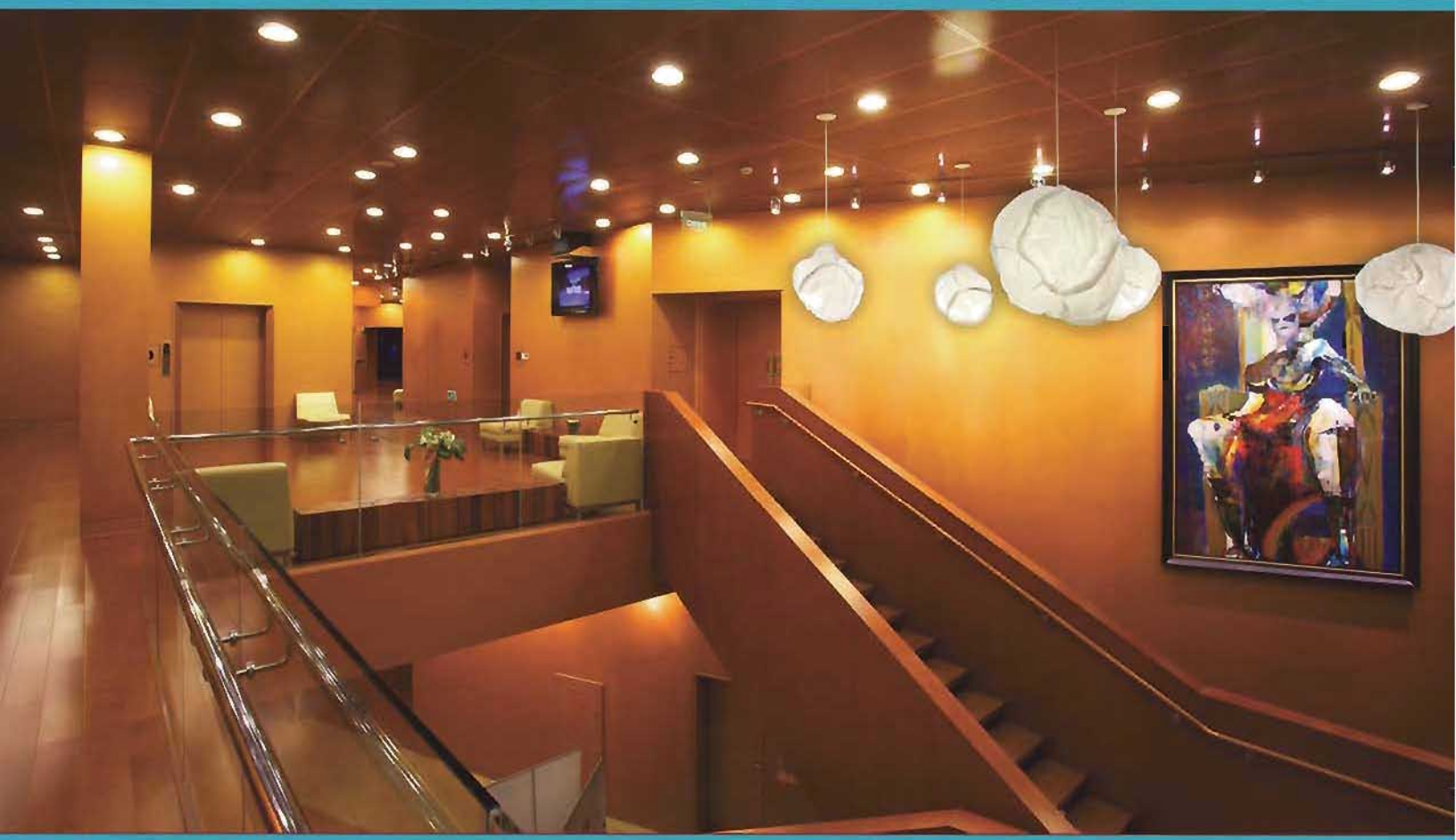

CANADA


CANADA
加拿大



NIGHT PERSPECTIVES

INTERIOR COURTYARD AND VIP FLOOR



DISCOVERY OF A UNIQUE PROJECT

SNC·LAVALIN

SOUTH ENTRANCE

WAITING AREAS

ENTRY TO INTERACTIVE EXHIBITION

INTERACTIVE EXHIBITION

INTERACTIVE EXHIBITION


枫艺轩
Canada Pavilion Boutique
Boutique du Pavillon du Canada
COPILOTE

Boutique


EXIT


RESTAURANT

VISITS FROM DIGNITARIES

SNC·LAVALIN

DECEMBER 5TH, 2009, Prime Minister of Canada
HONORABLE STEPHEN HARPER

SEPTEMBER 22ND, 2009, COMMISSIONER GENERAL
Mr. MARK H. ROWSWELL
ASSISTANT DEPUTY MINISTER, Public and Regional Affairs Sector,
Mrs. NICOLE BOURGET

APRIL 11, 2010, FORMER PRIME MINISTER HONORABLE JEAN CHRETIEN

JUNE 1st, 2010, Former Governor General of Canada
HER EXCELLENCY THE RIGHT HONORABLE MICHAËLLE JEAN

AWARDS AND TESTIMONIALS

SNC·LAVALIN

CANADA CHINA BUSINESS EXCELLENCE AWARDS

Member of the Year Award

Gold Award

Presented to

SNC-Lavalin International Inc.

In recognition of the bold elements and accomplishments of the company's project, and
Their significant contributions to the firm's growth and business model.
The project has differentiated the company from the competitors in the industry.

Peter Kruyt
Chairman

Peter Harder
President

Sarah Kutulakos
Executive Director

October 13, 2010
Beijing, People's Republic of China

CCBC - Member of the Year Award

Canada China Business Council
Conseil commercial Canada-Chine
加中贸易理事会

September 22, 2010

Mr. Charles Chebl
Senior Vice-President and General Manager
SNC-Lavalin International Inc.
455 René-Lévesque Blvd. West
Montréal, Québec H3Z 1Z3
Email: charles.chebl@snclavalin.com

Dear Mr. Chebl,

The Council is delighted to learn that SNC-Lavalin International Inc. has been unanimously chosen by an independent judging panel to be the **Gold Medalist of the Member of the Year Award**. In the eyes of the adjudicators who have carefully examined each award nominee's application, SNC-Lavalin International Inc. has tendered the best presentation. Upon a careful review by each of the judges and an open discussion among them, the judges are convinced that SNC-Lavalin International Inc.'s bold elements of the Project have made significant contributions to the firm's growth and business model and that the Project has transformed the company. As well, the Project has clearly differentiated SNC-Lavalin International Inc. from the competitors in the industry. Please accept the Council's heartfelt congratulations to SNC-Lavalin International Inc. for its marvelous achievement.

The award will be presented at the Gala Banquet of the Council's AGM and Policy Conference on Oct 13 in Beijing. The Council would like to invite your chief representative to receive the award and be recognized.

Congratulations on the great success! SNC-Lavalin International Inc.'s extraordinary commitment and outstanding accomplishment will be applauded and admired by all the attendees at the Gala Dinner, the CCBC membership, and the peers in your industry for many days to come.

Yours sincerely,

Alison Winters
Director, Vancouver Office
Canada China Business Council
Suite 600, 890 West Pender Street
Vancouver, B. C.
V6C 1J9
Tel: 604-681-8838; Fax: 604-681-8831 Email: alison@ccbc.com

18 JAN. 2011

Monsieur Charles Chebl, ing. M.Sc.A.
Vice-président principal et Directeur général
SNC-Lavalin inc.
455, boul. René-Lévesque Ouest
Montréal (Québec)
H2Z 1Z3

Monsieur, Cher Charles,

Par la présente, je désire vous faire part de la grande satisfaction du Gouvernement du Canada pour la qualité du travail accompli et les efforts déployés par SNC-Lavalin International inc. afin de réaliser la construction du Pavillon du Canada à l'Expo 2010, dans le respect du concept artistique ainsi qu'à l'intérieur des échéanciers prévus.

Du fait de sa composition singulière, ce projet clés en main comportait de nombreuses exigences techniques et fonctionnelles pour le moins exceptionnelles. Le pavillon que vous avez conçu, construit et opéré a accueilli en moyenne 35 000 personnes quotidiennement, pour atteindre, à la fin de l'Expo, le total sans précédent de 6 400 000 visiteurs; se classant ainsi parmi les dix premiers pavillons sur le site. Quelle magnifique réussite!

L'exposition universelle de Shanghai 2010 a été l'une des plus imposantes expositions internationales de l'histoire et à laquelle plus de 200 pays ont participé et accueilli au-delà de 70 000 000 de visiteurs. La fascination du public pour le Pavillon a permis au Canada de se démarquer en y présentant le fruit de sa créativité, de sa modernité, de son savoir-faire et de son esprit d'initiative. La collaboration exceptionnelle de votre organisation au cours des deux dernières années a joué un rôle de premier plan dans le succès de la participation du Canada à cet évènement plus grand que nature.

Plus particulièrement, je tiens à vous féliciter pour votre leadership, votre présence sur le terrain ainsi que l'étroite collaboration que SNC-Lavalin a su développer avec les entrepreneurs et intervenants locaux. Tout au long du projet, vous avez réussi, non seulement à relever plusieurs défis techniques, mais également à bâtir, mobiliser et inspirer une équipe de travail, et ce, en maintenant une fiche parfaite en matière de santé, sécurité et environnement.

.../2

L'excellence dont a fait preuve SNC-Lavalin dans sa gestion des ressources humaines a également contribué à présenter, au monde entier, une image exceptionnelle de notre pays.

Ce fut un privilège de travailler avec les membres de votre équipe. Aussi, je vous prie de bien vouloir leur transmettre mes sincères remerciements pour leur professionnalisme, leur dévouement et leur excellent travail qui ont contribué à faire de ce projet une expérience mémorable.

Encore merci et bravo! Je vous prie d'agréer, Monsieur, l'expression de mes sentiments les meilleurs.

La sous-ministre adjointe,
Affaires publiques et régionales,

Nicole Bourget

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