ADVANTAGE STEEL

NO. 55 SUMMER 2016

STEEL INNOVATION SHOWCASE

+ EDMONTON'S ICE DISTRICT & ROGERS ARENA

CARLETON UNIVERSITY'S MACODRUM LIBRARY RENOVATION

QUEEN RICHMOND CENTRE

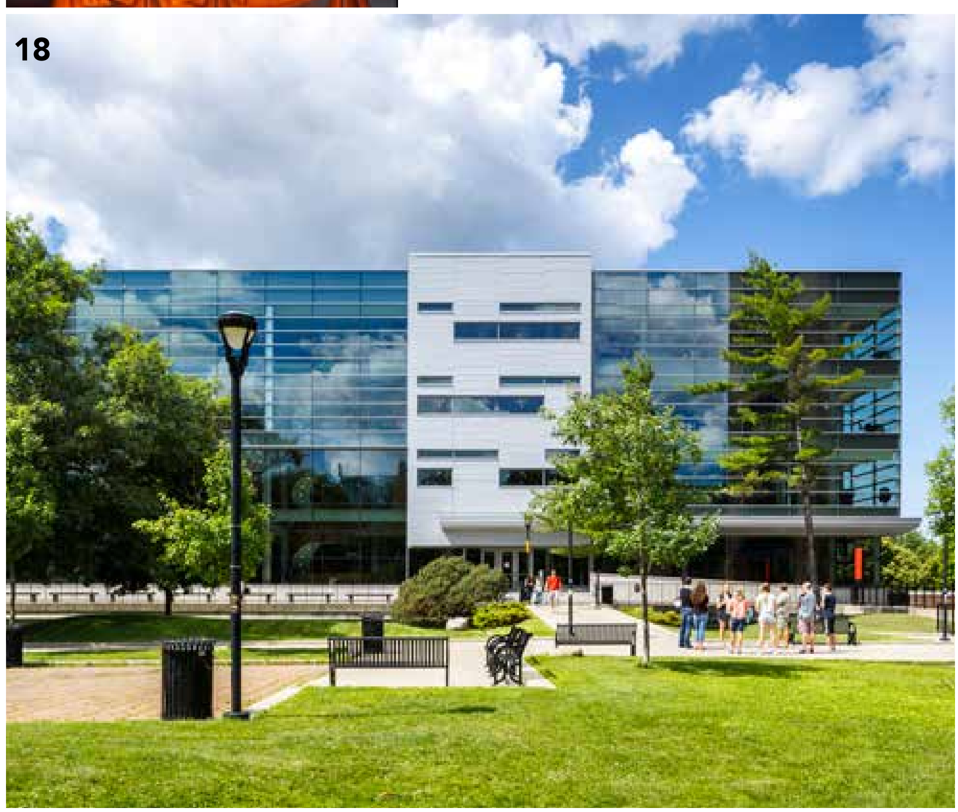
cisc icca
CANADIAN INSTITUTE OF STEEL CONSTRUCTION

PM#40787580

ADVANTAGE STEEL

NO 55 SUMMER 2016

FEATURES



IN EVERY ISSUE

COLUMNS

Professional engineers, architects, structural steel fabricators and others interested in steel construction are invited to inquire about CISC membership. Readers are encouraged to submit their interesting steel construction projects for consideration for inclusion in this publication by contacting CISC.

On the Cover: A rendering of Edmonton's forthcoming ICE District

Win-win

Ed Whalen, P.Eng.
ewhalen@cisc-icca.ca

/cisc_icca

CANADA HAS EVERYTHING we need as a country to be self-sufficient and prosper. We are world leaders in food production, have one of the largest reserves of fresh water in the world, have all the energy and mineral resources we would ever need and some to spare. There is little we need from outside of Canada and in fact the rest of the world needs us. We shouldn't be timid victims of global extortion and dumping but aggressive producers and sellers of products made from our own resources. So why is this not the case? Governments at all levels do not have an aligned vision nor economic foresight to understand how Canada can be a global leader in the two sectors that any country needs to be successful. In this day and age, successful countries need hard industries (manufacturing) and soft industries (high tech). Canada has both but they are suffering.

Jim Balsillie (Blackberry fame) suggested on CBC Radio in February that the Canadian "innovator sector" (think high tech) is lagging the rest of the world and the TPP (Trans-Pacific Partnership) will be its death. Is this prediction going to come true? I suppose there is no one better qualified to see death on the high tech horizon better than Jim Balsillie. However, if Jim is correct, governments had better start rethinking their hard industry strategy. I don't hear governments talking about how they will support and protect the industries that are paying the bills today such as manufacturing and construction and specifically the steel and steel construction industry. That said, millions of Canadians are in these industries.

Let's have a quick look at a few things that governments across Canada are doing to make industries more competitive to the likes of China and other countries. I like to call these Canadian Values (or industry killers, if governments are not careful):

- Minimum wage
- Corporate tax on manufacturers
- Sales taxes (provincial and federal)
- Provincial health care
- CPP
- EI
- Health and safety regulations
- Environmental regulations
- Minimum number of stat holidays
- Weekly maximum hours of work and overtime regulations
- Carbon taxes?
- Industry energy rates

The message here is that industries are not the problem, governments are. Now don't get me wrong, I believe in these Values too (ish), but if Canadian companies are not given credit for living under these rules by the same governments that apply them, then only two things are going to happen: the business will fail or they leave town. Governments have to stop setting minimum industry standards while ignoring these same values when it comes to government procurement and at the same time criticize Canadian industries for not being competitive. Talk about schizophrenia!

Recently, the US announced tariffs on China as high as 255%. The same levels have been applied here in Canada on a number of different goods including steel for years. This is proof that China and other countries are giving their companies the global advantage making it appear that our domestic supply is non-competitive. In fact our domestic producers are being strategically attacked.

My analysis of this whole problem is as follows:

1. The penalties for dumping are not high enough.
2. Believe it or not, there are other countries that help out dumpers when the dumper gets caught and high tariff gets imposed.

cisc icca
CANADIAN INSTITUTE OF STEEL CONSTRUCTION

CHAIRMAN
Laurier Trudeau, Abesco Ltd.

MANAGING EDITOR
Tareq Ali, CISC

Advantage Steel and the French-language edition **Avantage Acier** are published by the Canadian Institute of Steel Construction (CISC) on behalf of its members and associates. CISC is not responsible for the opinions expressed in this publication by those contributing articles. Visit us at www.cisc-icca.ca or **Tel 905 604-3231 | Fax 905 604-3239** for more information.

3. The real kicker is that we have importers in Canada that will recode imports to disguise the product and evade the tariff.

4. No national industry strategy.

5. Provinces and municipalities are ignorant of trade obligations, care little about the national trade deficit and don't understand the positive impact of local companies.

MY SOLUTIONS:

1. Make countries that illegally dump and subsidize their companies at the expense of Canadian companies pay and pay big time! Implement a two strikes you're out policy. Get caught once dumping into Canada and the existing tariff penalty would apply. Get caught twice, in the same general product category, then the country is banned in the general product category for a minimum period and I would argue for 10 years.

2. Countries that assist dumpers and act as decoy country of origin should be banned from Canadian ports for a minimum period of time and I would argue for 2 years.

3. Importers that fraudulently disguise their imports to evade tariffs or bans should be prosecuted and banned from importing anything for a period of 5 years. Owners and Directors of these importers should be banned from operating an import business for a period of 10 years.

4. Federal Government
   a Implement a National Trade Strategy and Council with provinces and industry.
   b Impose adjustments on transfer payments tied to provincial trade deficits. Make provinces think twice about buying offshore and make them look within Canada.
   c Educate provinces and municipalities on trade obligations.
   d Impose Canadian content or foreign price adjustment based on key Canadian Values.

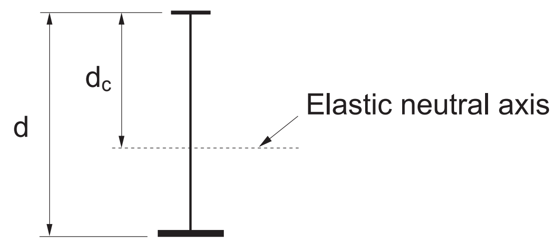
5. Provincial and Municipal Governments
   a Remove the lowest bid wins policy from the books and replace with best bid for the local, provincial and Canadian economy.
   b Implement Provincial Trade Strategy and Council including Municipalities.

So let's stop "digging and shipping" and start digging and processing, manufacturing, upgrading and building. Start to incent private owners to buy products and services from Canadian companies while leveling the playing field on government procurement. Let's play hard ball with import cheaters with a two strikes you're out policy including business suspensions and criminal prosecutions for Canadians. Maybe a sentence of deportation to the country they are colluding with would be just reward. AS

Alfred F. Wong, P.Eng., FCSCE
Director of Engineering

Question 1: For wide-flange sections used for building construction, should I specify CSA G40.21 Grade 350W or ASTM A992?

Answer: ASTM A992/992M should be specified. It is the grade that North American wide-flange mills produced to and CSA Standard S16-14 (and S16-09) explicitly recognize. Introduced in the 1990s as a product with enhanced properties for seismic applications, A992 is produced to additional controls for mechanical properties, such as a maximum yield stress limit and a maximum yield-to-tensile strength ratio. ASTM A992/992M steel is also preferred for greatest sourcing flexibility although mills in North America would certify their products destined for Canada to CSA G40.21 350W as well as ASTM A992/A992M.



Figure

Question 2: In National Building Code of Canada 2015, the period dependant Site Coefficient F(T), used for determination of seismic Design Spectral Accelerations, has replaced Site Coefficients F_a and F_v. CSA Standard S16-14, however, continues to reference Site Coefficients, F_a and F_v. Is S16-14 out of step with NBC 2015?

Answer: CSA S16-14 is compatible with NBC 2015. In S16-14, coefficients F_a and F_v, appear in two expressions: the short-period specified spectral acceleration ratio, $I_E F_a S_a(0.2)$, and the one-second specified spectral acceleration ratio, $I_E F_v S_a(1.0)$. Certain values of these quantities serve as triggers for more stringent requirements whereas other values set the conditions for relaxation. Although F(T) has replaced F_a and F_v for the purpose of determination of Design Spectral Accelerations in NBC 2015 the Code retains the expressions $I_E F_a S_a(0.2)$ and $I_E F_v S_a(1.0)$ as triggers. As defined in Sentence 4.1.8.4. 7) of NBC 2015, F_a = F(0.2) and F_v = F(1.0). Ideally, F(0.2) and F(1.0) should also replace F_a and F_v respectively in these trigger expressions. This was not possible in the 2015 code cycle for the following reason: In order to be considered for adoption by NBC 2015, CSA material design standards, S16, A23.3 etc., must be published in 2014. However, changes proposed for NBC, including the period dependant Site Coefficient F(T), could not be finalized in time to meet the publication schedule for the CSA standards.

Question 3: I am proportioning a mono-symmetric I-girder whose web-slenderness, h/w, marginally satisfies the Class 3 limit for W-shapes in pure bending in accordance with Table 2 of S16-09. Does this limit apply to mono-symmetric sections?

Answer: No, the limits for I-sections are provided in Table 2 of S16-09 for sections with equal flanges. CSA Standard S6, Canadian Highway Bridge Design Code, in Clause 10.10.3.1, addresses Class 3 web-limits for mono-symmetric I-sections. In this clause, the value of h is replaced by $2d_c$, where dc is the distance from the neutral axis to the compressive extreme fibre (see Figure). AS

Questions on various aspects of design and construction of steel buildings and bridges are welcome. They may be submitted via email to faq@cisc-icca.ca. CISC receives and attends to a large volume of inquiries; only a selected few are published in this column.

PCS Cory Mine
- *Cory, SK*

NBC 2015 Simplified Force Procedure for Low Seismicity

Alfred F. Wong, P.Eng., FCSCE
Director of Engineering

IN ORDER TO simplify the procedure for determining earthquake loads and effects in regions of low seismicity, a simplified static procedure has been introduced in National Building Code of Canada 2015. In this article, the force magnitude of a building in terms of the base shear, as determined in accordance with this simplified procedure, is compared to the base shear derived using the equivalent static force procedure and the base shear due to wind.

MAIN RESTRICTIONS

The application of this simplified procedure is subject to a number of restrictions. The main conditions that apply to structural steel *seismic-force resisting systems, SFRS,* are low specified spectral acceleration ratios at 0.2 second and 2.0 seconds, specifically, $I_E F_s S_a(0.2) < 0.16$ and $I_E F_s S_a(2.0) < 0.03$,

where:

I_E *and* $S_a(T)$ are the *importance factor* and the *5% damped spectral acceleration ratio for a period of T* respectively, and

F_s, the site coefficient based on the top 30 metres of soil,
= 1.0 for *rock* sites, when $N_{60} > 50$ or when $S_u > 100$ kPa,
= 1.6 when $15 \le N_{60} \le 50$ or when 50 kPa $\le S_u \le$ 100 kPa, and
= 2.8 for all other cases (see NBC 2015 for precise definitions).

Unlike the *site coefficient, F,* used in other procedures, F_s is not period-dependent.

"The seismic design base shear of a six-storey steel-framed commercial building is determined in accordance with the simplified procedure and the equivalent static force procedure."

MINIMUM LATERAL DESIGN FORCE

Within the stated restrictions, the minimum lateral earthquake design force at the base of the structure,

$V_s = I_E F_s S_a(T_s) W_t / R_s$

where:

W_t = the building weight,

R_s = 1.5 except R_s = 1.0 where a weak storey condition exists, and

$T_s = 0.025 h_n$ for steel braced frames and
$= 0.085 (h_n)^{3/4}$ for steel moment frames,
h_n being the height from the base.

V_s is subjected to a minimum value that corresponds to T_s = 1 second and, where R_s = 1.5, V_s need not exceed the value corresponding to T_s = 0.5 second.


KEEP PRODUCTION
IN THE GREEN
Peddinghaus
PROCESS MORE STRUCTURAL
STEEL WITH PEDDINGHAUS
ACQUIRE MAXIMUM THROUGHPUT
Plate Lines
CNC Layout Marking Lines
Drill Lines
Angle Lines
Coping Lines
For Western Canadian Sales Contact: Akhurst Machinery (780) 718-2228
For Eastern Canadian Sales Contact: AS Bond 003 (819) 260-3007
Peddinghaus
www.peddinghaus.com
info@peddinghaus.com
+1 (815) 937-3800

CASE COMPARISON

The seismic design base shear of a six-storey steel-framed commercial building (see Figure 1) is determined in accordance with the simplified procedure and the equivalent static force procedure. The seismic force parameters are as follows:

Locality: Windsor, Ontario

$S_a(0.2) = 0.096$, $S_a(0.5) = 0.063$, $S_a(1.0) = 0.035$, $S_a(2.0) = 0.017$;
$N_{60} = 40$; Wt = W = 33 900 kN;
$h_n = 22.7$ m; steel braced frame *SFRS*;
weak storey precluded, i.e. $R_s = 1.5$.

Simplified procedure:

$F_s = 1.6$ ($N_{60} < 50$)
$I_E F_s S_a(0.2) = 1.0(1.6)(0.096) = 0.154 < 0.16$
$I_E F_s S_a(2.0) = 1.0(1.6)(0.017) = 0.027 < 0.03$
$T_s = 0.025h_n = 0.025(22.7) = 0.568$ s
$T_s < 1$ s but > 0.5 s
$S_a(0.568) = 0.059$ (by interpolation)
$I_E F_s S_a(T_s) W_t / R_s$
$= 1.0(1.6)(0.059)(33\,900)/1.5 =$ **2130 kN**

Equivalent static force procedure:

$R_d = 1.5$; $R_o = 1.3$ *(Conventional Construction)*
$T_a = 1.14$ s (T_a is longer but limited to $2 \times 0.025h_n$)
$V = I_E F S_a(1.14) W M_V / (R_d R_o) =$ **869 kN**

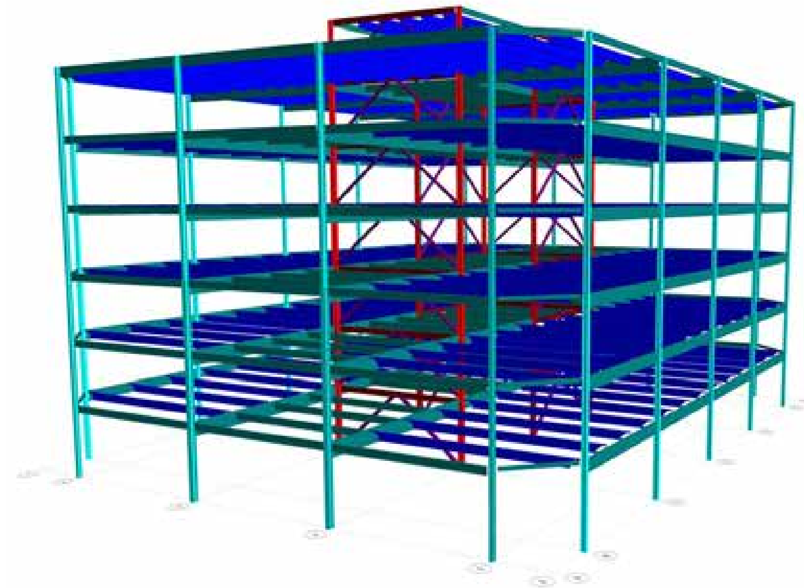


FIGURE 1: Six-storey steel-framed commercial building

Wind base shear for open terrain = **1480 kN**

In summary, the simplified procedure gives a seismic base shear that is 2.5 times the value derived from the equivalent static force procedure. If the simplified procedure is used, seismic forces control the design; otherwise wind effects govern.

It should be noted that the simplified procedure gives even more conservative results for *Site Classes A* and *B* because $F_s = 1$. However, when the simplified procedure is permitted and used, some restrictions and additional requirements for post-disaster buildings, including the use of more ductile systems, are waived. AS

Tareq Ali, RPM
Director of Marketing, Communications, and Membership Services

Designing healthy buildings with the WELL Standard

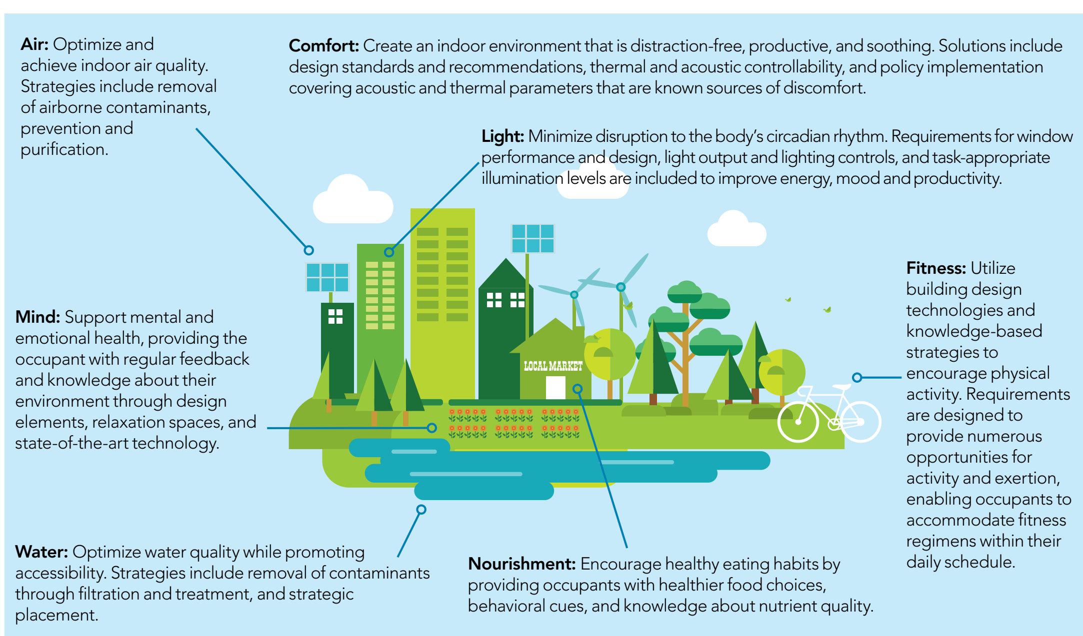
With sustainability already a mainstream consideration in building design, the conversation is now shifting beyond green buildings to buildings that are "healthy". These are buildings that are designed with the health and wellbeing of its occupants as the primary focus with considerations for nourishment, physical health, mental health and wellness, and healthy behaviour choices.

In 2014, the U.S based International WELL Building Institute™ (IWBI) launched the WELL Building Standard® [WELL] to provide a framework for designing such "healthy" buildings where we tend to spend 90% of our time. The WELL Building Standard was developed by integrating scientific and medical research and literature on environmental health, behavioral factors, health outcomes and demographic risk factors that affect health with leading practices in building design and management. WELL also references existing standards and best practice guidelines set by governmental and professional organizations where available, in order to harmonize and clarify existing thresholds and requirements.

The WELL Building Standard is a performance-based system for measuring, certifying, and monitoring features of the built environment that impact human health and well-being, through air, water, nourishment, light, fitness, comfort and mind. The WELL Standard is third-party certified through IWBI's collaboration with Green Business Certification Inc. (GBCI), which administers LEED certification and the LEED professional credentialing program. This relationship assures that WELL works seamlessly with LEED.

Projects earn WELL Certification by achieving features in seven categories of building performance – air, water, light, nourishment, fitness, comfort, and mind. Each WELL Feature is designed to address issues that impact the health, comfort or knowledge of occupants through design, operations and behavior.

Specific metrics measured in each of the seven categories are outlined below:



WELL CERTIFICATION INVOLVES FIVE STEPS:

1. **Registration:** WELL Certification begins with registration through WELL Online, an online platform designed to take projects through the WELL certification process from start to finish.

2. **Documentation:** Documentation is required prior to final certification review.

3. **Performance Verification:** A series of onsite post-occupancy performance tests known as Performance Verification occurs.

4. **Certification:** WELL Certification recognizes that the project has successfully documented compliance with all features and passed Performance Verification.

5. **Recertification:** Recertification, which must be completed after three years, ensures that the project maintains the same high level of design, maintenance and operations over time. For Core and Shell projects, no recertification is required.

The WELL Building Standard can be applied across many real estate sectors, with WELL v1 optimized for commercial and institutional office buildings. WELL is further organized into Project Typologies of New and Existing Buildings, New and Existing Interiors, and Core and Shell, which account for specific considerations that are unique to a particular building type. Pilot Programs are also available for market sectors including retail, multi-family residential, education, restaurant, and commercial kitchen projects.

"More than 120 projects have already registered or certified through WELL globally."

"The WELL Building Standard was developed by integrating scientific and medical research and literature on environmental health, behavioral factors, health outcomes and demographic risk factors that affect health with leading practices in building design and management."

In 2015, the Canada Green Building Council [CaGBC] announced that CaGBC would be working with Green Business Certification Inc. [GBCI] to promote and advance WELL in Canada.

More than 120 projects encompassing more than 25 million square feet have already registered or certified through WELL globally. AS

Source: The International WELL Building Institute website. For more information, visit www.wellcertified.com.

"The WELL Building Standard can be applied across many real estate sectors, with WELL v1 optimized for commercial and institutional office buildings."

MODEL	PORTS	PRESSURE RATING	OUTPUT FLOW	MOTOR SPEC.	PENDANT CONTROL	RESERVOIR CAP
JM-8	8	10,000 PSI	27 cu.in/min.	1.5 hp-115v	20' Motor/Valve	10-40 G
JM-10*	10	10,000 PSI	40 cu.in/min.	1.5 hp-115v	20' Motor/Valve	10-40 G
JM-12	12	10,000 PSI	60 cu.in/min.	3 hp - 230/460	20' Motor/Valve	10-40 G

MACODRUM LIBRARY'S S

Carleton University facility becomes star campus attraction

Matt Bradford

TEEL TRANSFORMATION

Photo credit: All photos by Doublespace Photography

OTTAWA'S CARLETON UNIVERSITY inked another chapter in its Campus Master Plan with the recent renovation and expansion of its MacOdrum Library – and it's a story that could only be told with steel.

A campus staple since 1958, the MacOdrum Library has undergone numerous upgrades throughout its 60-plus years. None, however, were as dramatic as its 2015 revitalization which saw additions constructed on its east and west sides, as well as extensive renovations within.

"The MacOdrum Library at Carleton University has seen many transformations over the decades," says Sydney Browne, Principal with Diamond Schmitt Architects, designers of the project. "This latest – and largest – project added close to 75,000 square feet of space and relied on steel moment frames to tie into the existing structure, support the vertical steel addition, and integrate with the design in order to provide unimpeded views throughout the five-storey glazing on the new façade."

Conducted as part of the University's ongoing Campus Master Plan initiative, the MacOdrum Library project included the development of a two-storey addition atop an expansion built in the 1990s; and five more storeys added to the east side's older 1950s frame.

The work was carried by consulting project managers Turner Townsend alongside Toronto-based Diamond Schmitt Architects, who partnered for the final construction with Ottawa-based Edward J Cuhaci and Associates Architects. Along with engineer WSP (formerly Halsall Associates), steel fabricator Mometal Structures Inc., and a seasoned team of trades, the team retrofitted the original facility with 74,200 square feet of new usable space and a refreshed facade, and renovated approximately 34,700 square feet of the library's interior.

"This was a rewarding project," says Arrigo Ciccarelli, Mometal General Manager. "Using steel allowed students to benefit from a nicer place to visit and the University was able to save money. To do what we did with steel using concrete would have cost a lot more and be a lot harder to achieve."

Certainly, the choice to use steel was critical to achieving both those goals. Fortunately, the Quebec-based team at Mometal brought the experience and skills necessary to see those goals through.

On the west side, for example, crews were challenged with adding two new levels to an existing structure that, while initially designed to accommodate vertical expansions, no longer adhered to modern seismic hazard codes. This left the University with the choice of either paying for a costly upgrade to the original concrete structure or finding a more effective and budget-friendly alternative.

"When we started this project, we were trying to minimize the extra seismic force that we're putting on the existing building," says David Arnold, Structural Engineer with WSP. "Seismic forces are directly proportional to weight, and steel framing is inherently a lighter system than a concrete framed system, which is one of the main reasons we relied on it for the project."

Herein, steel moment frames were used to construct the fourth and fifth-floor additions thanks to their reduced weight and installation flexibility. In the end, this allowed owners to bypass a full structure upgrade and architects to pursue greater creativity with their exterior designs.

Moreover, Browne notes, constructing the west side additions afforded crews a more convenient way of installing sunshade features into the vertical expansion: "A system of exposed steel framing and perforated screens on the building's exterior allowed for the use of extensive perimeter glazing, which in turn provides daylight and views for occupants while reducing solar heat gain within the building."

Adds Arnold: "It's really nice when you have a steel frame building. It's easy to just connect those bits of jewellery around the outside of the

MacOdrum Library's revitalized interior promotes a fresh and open approach to learning

"The university was strongly motivated to improve both the outside look of the building, to make it a more attractive building, and create an interior place where students would want to come, study, and congregate."

building to the steel framing. That really worked quite nicely.

MacOdrum's east side renovation also owes its success to steel. Construction took place over an underground pedestrian walkway, tasking crews with installing the new floors and a curtain wall while being mindful of putting too much weight on the tunnel passage.

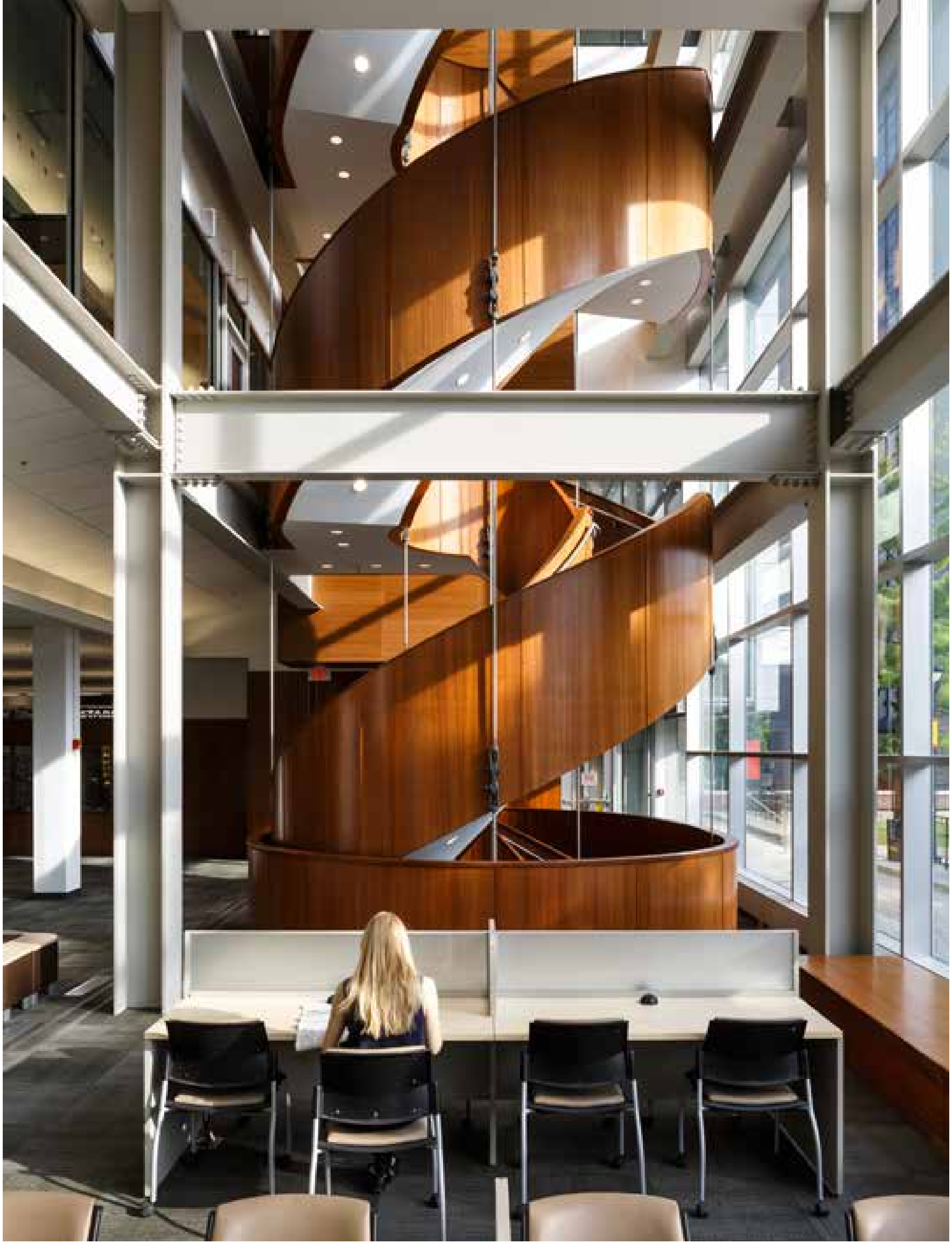
"We were dropping steel columns down through the mid-point of the tunnel roof, so you can imagine needling in the steel structure around this old, existing concrete. That was a lot easier to do with steel than it would have been to do with concrete," explains Arnold, noting the lightweight nature of steel provided an opportunity to install the pieces by crane without using heavy machinery over the tunnel ceiling.

INSIDE TRANSFORMATION

While the library's new facade and expanded footprint is turning heads at Carleton University's campus, MacOdrum Library's rejuvenated interior is also drawing crowds. Among the highlights of the western expansion include new study rooms, digital media spaces, a special collections study, help desk, and a slate of aesthetic upgrades.

Elsewhere, the new library also enjoys more social spaces, a more inviting educational environment, and a more open design.

"By using moment frames, there is no cross bracing which would cut into the space, just columns and beams. As a result, the steel



connections are highly integrated and the design work is very detailed, requiring several months of design," explains Browne, adding that the use of a relatively lightweight steel framing system also allowed for the addition of two floors over a portion of the existing building, without triggering the need for additional structural reinforcing of existing lower floor levels.

Perhaps the most notable feature of the new library, however, is its signature helical mahogany staircase, a steel-made structure which coils upwards through the west side expansion. Fabricated and pre-assembled at Mometal's shop, the feature was shipped to the site in pre-fabricated segments which were assembled and suspended on site. Upon completion, it was hung from the building structure at roof level using exposed stainless steel hanger rods, which were themselves pre-stressed to minimize any pedestrian-induced vibrations in the stair. Additionally, the curved stringer members of the stair were constructed from specially fabricated steel tube sections.

Speaking to the challenges of installing this centrepiece component, Ciccarelli notes, "To do a circular staircase the way we did...there aren't many companies that could do it. But the challenge wasn't really the fabrication, but the logistics around getting it in there because we were limited in space and schedule."

As such, Mometal prepared a logistical plan for the stair's erection, successfully installing what is now one of the library's most standout features. Speaking to steel's role once more, Arnold adds, "Steel was the obvious choice for the stairs since it would have been almost impossible to build something like that out of concrete framing. With steel, you can be really creative with unusual geometries and the steel fabricator Mometal did a great job of fabricating this corkscrew kind of stair. It's certainly one the biggest highlights."

A NEW LOOK

Since opening the doors to students in early 2015, the MacOdrum Library has become a standout feature at Carleton University's campus. In addition to inspiring further interior upgrades, the facility stands as a testament to the versatility steel, and the benefits of project leadership.

The project has also captured the attention of the construction industry itself, earning Ontario Library Association's building award for Library Architectural and Design Transformation, and a finalist spot in the Quebec Steel Design Awards of Excellence. "Projects Outside Quebec" category.

"As explained by the Library Director, the renovation and expansion has transformed the library, which is reflected in the significant increase in numbers of students and faculty who come through its doors," says Browne. "It's also allowed the library to expand its services, attract new users, and offer more opportunities to existing clients."

Adds Ciccarelli: "We're proud of this project and the benefits its brought to students and the University." AS

PROJECT TEAM

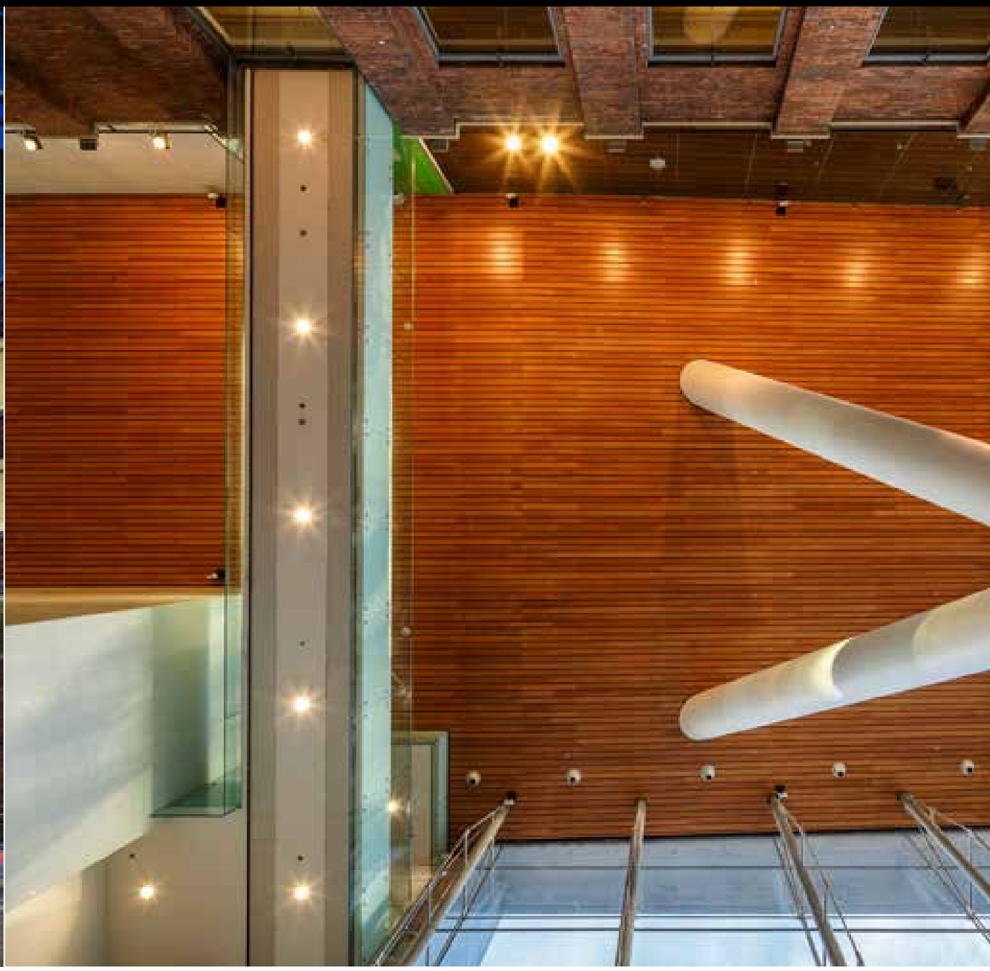
OWNER: CARLETON UNIVERSITY **GENERAL CONTRACTOR:** PORMERLEAU **CONSULTING PROJECT MANAGER:** TURNER & TOWNSEND **STRUCTURAL ENGINEER:** WSP (FORMERLY HALSALL ASSOCIATES) **ARCHITECTS:** DIAMOND SCHMITT ARCHITECTS / EDWARD J. CUHACI OF OTTAWA **CISC STEEL FABRICATOR:** MOMETAL STRUCTURES INC.

FEATURE

SUPPORTING THE QUEEN

Steel addition brings new life to downtown Toronto site

Charlie Jenks, CISC Regional Manager, Ontario



RARELY DOES A PROJECT symbolize the true coordination of architectural, engineering, product design, and material selection quite like the Queen Richmond Centre West in Toronto, Ontario.

Launched by project Owner Allied Properties REIT, the goal behind the high-profile development was to create what the firm calls a "truly unique professional office complex" at Peter and Richmond Street in Toronto's downtown core by transforming a four-storey and five-storey heritage building into a 305,000 sq. ft. office complex.

To achieve this, an idea was conceived to hover the new building above the existing heritage structures. This created a win-win situation wherein the existing buildings would be rejuvenated. A "soaring atrium" could be built around them and a new tower above. In so doing, however, crews faced a structural challenge of supporting the eleven-storey addition that was needed to achieve the target square footage.

The design team spent a year researching ways to develop an impressively-designed building while maintaining a collaborative, mutually agreeable approach. The final design they settled on was one with three, 70-foot tall mega delta frames consisting of four lower legs and four upper legs that meet approximately

RICHMOND CENTRE WEST



Photo credit: Photos Courtesy of doublespace Photography, Sweeny &Co Architects, Stephenson Engineering, Cast Connex, Walters Group, and Terri Meyer Boake

half way up at a central node. The existing L-shaped atrium would house these enormous frames, and each of the legs would be 1000 mm in diameter, 50 mm thick, and concrete filled. The structural design solution allowed for an unencumbered view through the atrium.

The design team worked closely with Walters Group Inc. under a competitively earned design assist arrangement to determine a fabrication and erection process that

"The goal behind the high-profile development was to create what the firm calls a 'truly unique professional office complex' at Peter and Richmond Street in Toronto's downtown core."

"Throughout the development process, the use of BIM technology allowed the team to envision the options and determine the best solution for the node."

would fit the constructability requirements and Sweeny &Co Architects Inc.'s vision, while supporting the significant structural requirements of Stephenson Engineering's design.

A number of possible structural solutions were investigated, such as splaying the legs out at the central kernel point of the frames and connection to a massive steel transition plate. In the end, it was decided that a structural casting would be used at the nodes. The delta frame's lower "legs" would also taper down in diameter to a raft footing. By working closely with Walters, the competing demands of aesthetics, constructability, cost and structural demand were optimized.

Throughout the development process, the use of BIM technology allowed the team to envision the options and determine the best solution for the node.

"Each mega delta frame had to be capable of supporting forces of 80,000kN, which is approximately equivalent to the weight of 400 transport trucks," explains Sweeny &Co in its project documents.

The engineering requirements of the node included:

- Volumetric optimization of the gross nodal geometry;
- Industrial design of the node, including shaping of its exterior based on aesthetic considerations and shaping of the interior based on structural and manufacturing constraints;

- Establishing manufacturing requirements in collaboration with Walters with respect to joint detailing; tolerancing, and field erection methodologies

Under the direction of Allied Properties, the Project Team of Sweeny &Co, Stephenson Engineering, Eastern Construction, Walters Group Inc. and Cast Connex worked tirelessly to overcome the project's many challenges to balance vision with economics.

As Carlos de Oliveira, Co-founder, President and CEO of Cast Connex Corporation, recalls, "Collaborating with Sweeny &Co, Stephenson Engineering and Walters on this project was very rewarding, and the success of the collaboration is immediately evident when you enter the building's atrium. Together, we were able to create a steel structure which not only carries an astonishing amount of load, but which is perceived as sculpture."

Speaking to the project's innovative design, he adds, "The node was intentionally shaped to cause the legs of the frames to appear to bend away from one another just as they gracefully meet, which results in a vertical continuity of visual flow and produces frames which appear monolithic in form. We're very proud of the marriage between function and aesthetics that we achieved in this project."

Walking through this incredible project, it is difficult to imagine the tremendous loads these mega delta frames support yet it is easy to be in awe of how the massive truss system tying the three mega deltas completes the backbone of this structure. One can also appreciate how the nodes allow a seamless architecturally-exposed finish, providing a space and quality finish that only structural steel and steel castings could offer. AS

PROJECT TEAM

CISC MEMBER FABRICATOR (AND CERTIFIED STEEL STRUCTURES) – WALTERS GROUP INC. **CISC ASSOCIATE** – CAST CONNEX **CISC STEEL DETAILER** – WALTERS GROUP INC. **CISC STEEL ERECTOR** – WALTERS GROUP INC. **OWNER** – ALLIED PROPERTIES REIT **ARCHITECT** – SWEENY &CO ARCHITECTS **STRUCTURAL ENGINEER** – STEPHENSON ENGINEERING LIMITED **GENERAL CONTRACTOR** – EASTERN CONSTRUCTION COMPANY LIMITED

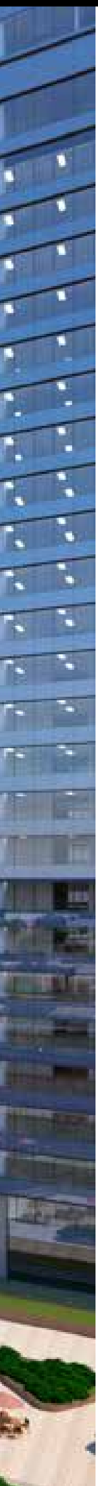
EDMONTON'S ICE DISTRICT

World-class sports and entertainment district taking shape in

Neil Kaarsemaker, CISC Regional Manager, Alberta & Saskatchewan

& ROGERS PLACE ARENA

Alberta's capital



TO SAY there is something dramatic happening in Edmonton's downtown would be an understatement. There are multiple construction cranes sweeping the sky in a tight four-block square, and your eye catches the distinctive steel clad curved outline of Rogers Place Arena that straddles 104 Avenue dominating the northern edge of the development branded as the ICE District.

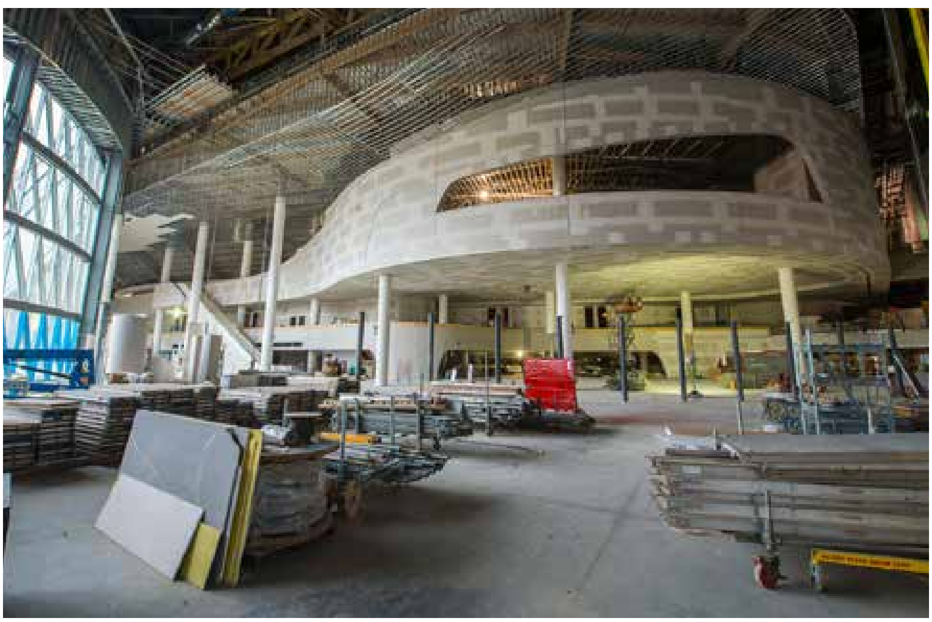
The 27-storey City of Edmonton tower (Tower D) rises along 101 Street, the eastern edge of ICE District, with it's steel frame still visible on the upper floors. The foundations are being poured for the 66-floor Stantec tower which, when finished, will be the tallest tower in Canada outside of Toronto, adding another aspect to the intense rivalry between Edmonton and Calgary, Alberta's two major cities.

The vision for this $2.7 billion of private and public development, which will produce 1.3 million sq. ft. of new office space, over 1,000 new residential units, a new luxury hotel, a Las Vegas style casino, and the most impressive arena in the NHL, has been ten years in the making. The development is a innovative partnership between a private development joint venture and the City of Edmonton.

"The steel fabricators were selected and brought into the design process at a very early stage so that their expertise and perspective could be brought to bear to help identify and resolve construction challenges each of these buildings would present."

"We set out a vision seven years ago for how an iconic new downtown arena could be the catalyst for positive change for downtown and the entire Capital region," said Daryl Katz, Chairman, Katz Group. "It's exciting to see that vision come to life. We are very proud that Phase 1 of this project will be the largest mixed-used sports and entertainment project in Canada and, we believe, a great reflection of Edmonton's spirit and potential."(1)

The selection of building designs was crucial to achieve the look and feel the development team had for ICE District. A very tight construction schedule, in a cold weather climate city within a



tightly confined construction site in the middle of an active downtown core, meant the selection of the building material and construction partners were critical to the success of the project.

The Edmonton Oilers, the primary tenant of Rogers Place Arena, were determined to open their 2016-17 National Hockey season in their new home. This meant the completion date for the arena had little to no flexibility. The pressure was on.

When the project architect HOK of Kansas City, structural engineer Thornton Tomasetti of New York, their local design consultant partners, and Edmonton-based construction manager PCL reviewed their options, all agreed that structural steel was the best choice for the arena. Design teams for the other key buildings came to the same conclusion. The speed of construction – especially in cold climate conditions – and the flexibility to allow for design modifications in large, open concept structures meant that structural steel was the building material of choice for Rogers Place Arena, City of Edmonton tower (Tower D), and Block K (Edmonton Oilers Entertainment Group offices, Grand Villa Edmonton Casino, and arena loading dock).

The innovative approach to this development continued with the decision to use a design-assist model in each of these buildings. The steel fabricators were selected and brought into the design process at a very early stage so that their expertise and perspective could be brought to bear to help identify and resolve construction challenges each of these buildings would present.

The design-assist process is attractive to most fabricators as it allows them to bring their experience in constructability and associated fabrication issues early in the design process. The perspective of the fabricator can help to anticipate and overcome construction challenges and bring appropriate solutions to the project team. A high functioning design-assist team has the chemistry that delivers the symmetry needed to achieve creativity for innovative design that achieves construction efficiency.

The benefit of early steel fabricator engagement was stressed in comments from Ryan Gedman of architect HOK and reinforced by Jesse Chrismer of Thornton Tomaseti, who noted, "For any project that requires specialized engineering and fabrication, there are certain factors that are critical to a smooth process. First, all consultants and stakeholders must have a seat at the table to help shape and refine the project approach. This allows them to share knowledge and provide realistic pricing. Second, it's always helpful to have consultants involved as early as possible in the process. As architects, we

A COOL ADDITION

The Winter Garden is a defining design feature of Rogers Place Arena. Spanning 104 ave, a major 4 lane downtown traffic artery, this 24,000 sq. ft. multi-use space is up to 70 metres wide and 25 metres tall with 1,100 tons of steel and can hold 850 Ford F-150 half ton trucks stacked atop one another. A number of design modification were made by the project team here as well to cost effectively accomplish the goal of "an iconic front grand entrance at the south face of the arena serving not only as a bridge but also as an exterior lobby and an event space in it's own right." (3) Working with the fabrication team at Walters, the project team developed an innovative means of supporting the irregularly shaped open spaces while concealing the expansion joints under the bridge deck and reducing the steel required for the structure by 50 tons. Erecting the Winter Garden presented it's own logistical challenges and to minimize traffic disruption, work could only proceed in the evenings and weekends.

appreciate the knowledge base of the experts who help make our designs a reality and we value having them involved from day one."

There was extensive consultation with the fabrication and erection team for the roof of Rogers Place Arena. Ed Cote of Whitemud Ironworks indicated that they worked with the entire project team to review the positioning of cranes, the number of lifts, the size of the cranes required, and the time each crane would be required.

It was also noted by Serge Dussault of Canam Heavy that these extensive consultations resulted in a significant redesign of the roof truss configuration. The roof surface area for Rogers Place arena was designed to be 40 per cent larger than that of Bell Centre in Montreal or Air Canada Centre in Toronto to cover large concourse areas and open spaces behind the seating bowl. (819k sq. ft. of arena space compared to 650k sq. ft. for other major arenas).

The end result of the roof redesign, according to Jesse Chrismer of Thornton Tomasetti, was an increase in the tonnage of the roof structure and crane lift capacity required at a lower total cost. This was achieved due to a less complex fabrication process that allowed for more ground assembly onsite, less shoring towers, a more simplified erection process and reduced crane time. The staging of the roof truss erection was a delicate logistical ballet as roof sections were trucked to site, positioned on the floor of the seating bowl for pre-assembly, then lifted into place by the massive 350-ton Liebherr cranes from inside the arena. Then there was the staging of the removal of the shoring towers and cranes themselves post erection.

Each structure presented its own challenges that the project team needed to tackle. The subtle curvature of the north and south facades of City of Edmonton Tower (Tower D) required extensive planning and consultation between the architect, engineer, and fabricator. We were advised by Martin Savoie and Daniel Proulx of Beauce Atlas that to achieve this distinctive design feature, it required

sourcing of a larger than normal beam size and very precise fabrication. They indicated that they needed to modify their erection procedure every second floor to maintain the slope of the facade, all the while maintaining the aggressive erection schedule that the project demanded and structural steel provided. The marshalling of the steel sections was a logistical challenge as well. With limited laydown space on site, a marshalling area was established in Fort Saskatchewan, just outside of Edmonton where the steel sections were carefully labeled for appropriate sequencing of shipment to site to achieve a steady and seamless erection process.

For Block K, the challenge for the team was related to the wide range of uses for the structure. Part office space, part Las Vegas style casino, and part arena loading dock, the structure required flexibility and precision in fabrication and erection. The column free loading dock area required beams spanning 27 metres in the three storeys above. We were advised by Steven Oosterhof of DIALOG that these long spans used some of the deepest rolled sections that are available and several custom plate girders. Working with the fabricator, Quirion Metal, they were able to significantly rationalize the steel used and anticipate their needs for steel members with long lead times and bulk pre-order to maintain their schedule. Steven also reported that through collaboration between architect, engineer and fabricator they reduced lag time between design and construction by sharing design details early in the project.

There is a great deal of anticipation in Edmonton for the completion of Rogers Place Arena, scheduled for fall of 2016. The first concert date has been announced and the Edmonton Oilers are scheduled to drop the puck for their 2016-17 NHL season under the meticulously designed, fabricated and erected steel roof. The City of Edmonton is anticipating it's move into their gleaming new tower with it's elegant curved facades. Block K will be ready for business as the new headquarters for Oilers Entertainment Group, home of Grand Villa Edmonton Casino and the crucial loading dock for sports team and entertainers who need to move their bus loads and truck loads of gear into the spacious hold of Rogers Place Arena. The steel construction industry can be justifiably proud of the role they played in the design and construction of what will be known as one of North America's premier sports and entertainment districts and the pride of Edmontonians. AS

ROGERS PLACE ARENA

ARCHITECT: HOK AND LOCAL PARTNERS CISC ASSOC DIALOG AND ARCHITECTURE TKALCIC BENGERT **ENGINEER:** THORNTON TOMASETTI & CISC ASSOC DIALOG **FABRICATOR:** CISC MEMBERS CANAM HEAVY & WHITEMUD IRONWORKS **ERECTOR:** ALCO (JOINT VENTURE PARTNERS LPR CONSTRUCTION & WHITEMUD IRONWORKS)

WINTER GARDEN

ARCHITECT: HOK AND LOCAL PARTNERS CISC ASSOC DIALOG AND ARCHITECTURE TKALCIC BENGERT **ENGINEER:** THORNTON TOMASETTI & LOCAL PARTNERS, CISC ASSOC DIALOG **FABRICATOR:** CISC MEMBERS CANAM HEAVY & WALTERS GROUP **ERECTOR:** ALCO (JOINT VENTURE PARTNERS LPR CONSTRUCTION & CISC MEMBER WHITEMUD IRONWORKS)

TOWER D

ARCHITECT: STANTEC CONSULTING **ENGINEER:** STANTEC CONSULTING **FABRICATOR:** CISC MEMBER BEAUCE ATLAS

BLOCK K

ARCHITECT: HOK AND LOCAL PARTNERS CISC ASSOC DIALOG AND ARCHITECTURE TKALCIC BENGERT

ENGINEER: CISC ASSOC DIALOG & THORNTON TOMASETTI **FABRICATOR:** CISC MEMBER QUIRION METAL

(1) http://www.marketwired.com/press-release/ead-joint-venture-unveils-new-details-about-the-edmonton-arena-district-1942436.htm
(2) Civil Engineering- 20160315- A Bridge to the Future
(3) Civil Engineering – 201601415 – A Bridge to the Future

Innovation To Increase Efficiency

"At ADF Group, the first thing we look at when investing in our production process is where we could gain the most efficiency and improve productivity, while at the same time preparing for the future. With FICEP equipment, we actually adopted tomorrow's technologies today.

The automated production lines at our Canadian operations use FICEP high performance equipment since 2007. Because of the gain in productivity and quality, we also chose FICEP equipment for our new state-of-the-art fabrication plant in the United States"

Mr. Jean Paschini, Chairman and CEO
ADF Group Inc.

A drive to constantly improve, to meet increased demands for higher efficiency and throughput, has made FICEP a global leader for the past 85 years.

Don't just take our word, ask our customers...

FICEP equipment owners have seen the results, with unmatched reliability and increased productivity.

Call and let us show you solutions designed specifically for your operation.

FICEP
CORPORATION

FICEP Corporation
2301 Industry Court I Forest Hill, Maryland 21050
Phone (410) 588-5800
Fax (410) 588-5900

www.ficepcorp.com

Continuing Education Courses

CISC continues to increase the number of courses and seminars available in the Self-Paced Learning Centre, which offers online education that qualifies for Continuing Education Units (CEUs) using video presentations packaged with notes, design guides, assignments, tutoring and examinations where available. Newly added to the portfolio is the updated Industrial Building Design course and the updated Steel Bridges – Design, Fabrication, Construction course. In addition, look for the discounted bundles of Hot Topic Webinars.

For full course and seminar schedule, information, online registration and the latest updates, please visit our website at www.cisc-icca.ca/courses.

NEW CISC MEMBERS AND ASSOCIATES (SINCE JANUARY 2016)

MEMBERS

Fabricator:
Sierra Fabricating and Manufacturing
23 Exploration Drive
Devon, AB

Detailer:
Tech-Line Design
306-1450 Bishops Gate
Oakville, ON

ASSOCIATES

Fabricator:
CB Metal Works
136 Main Hwy
Avondale, NL

Supplier:
Supreme Galvanizing Ltd.
15 Blair Drive
Brampton, ON

Sherwin Williams
28 – 33rd Street East
Saskatoon, SK

Builder/Stakeholder:
IMPACT Canada
205 Chatelain Drive
St. Albert, AB

IMPACT Canada
#14 – 3710 Eastgate Drive
Regina, SK

Professional – Individual:
Aaron Rideout PEGNL, APENS, PEO
Morrison Hershfield
St. John's, NL

Daniel Estabrooks, B.Sc, Peng.
Estabrooks Engineering Inc
Saint John, NB

Professor:

Phalguni Mukhopadyaya
University of Victoria
Victoria, BC

Ryan Habkirk
Georgian College
Barrie, ON

Tracy Becker
McMaster University
Hamilton, ON

Rodney A. Hunter
SAIT
Calgary, AB

Technical – Individual:
Martin Kowalyk
Civil Engineering Technologist (CET)
Moose Jaw, SK

SEISMIC DESIGN OF INDUSTRIAL STEEL STRUCTURES + CSA S16-14 ANNEX M
– NEW LIVE ONLINE COURSE –

This half-course will elaborate on earthquake design procedures and SFRS options in the 2015 NBCC and CSA S16-14 for industrial buildings illustrated using the mill-building example in the Industrial Building Design course. In addition, CSA S16-14 Annex M is introduced and applied to the design of pipe and process support structures.

Course Leader:
R. Mark Lasby, B.Sc., P.Eng., Principal Structural Engineer, Fluor Canada Ltd.

Live Online, 2 x 2 hr Sessions, August, 2016 (TBD), 12:00 - 2:00 p.m. and 3:00 - 5:00 p.m. ET

STEEL BRIDGES – DESIGN, FABRICATION, CONSTRUCTION
– NEW SELF-PACED LEARNING COURSE –

This 16-hour course covers the design, fabrication and construction of steel bridges based on CAN/CSA-S6-14, Canadian Highway Bridge Design Code. The course provides understanding on design theory and the rationale behind Code provisions as well as the application of specific Code formulae and requirements. The practical and economical aspects of fabrication, erection, choice of material and their impact on design have been emphasized.

The presentations and the Course Notes include four updated design examples illustrating extensive design calculations for I-girders and box girders of straight and curved configurations. Topics include fatigue and brittle fracture, integral abutments, aesthetics, design process and economics, highway bridge loads and methods of analysis, I-girder design, straight and curved box girder design, wind and seismic effects, fabrication and economical details, construction and erection methods, and an architectural perspective on pedestrian bridges.

Major changes and new provisions that were introduced in the 11th edition of CAN/CSA-S6 and their effect on the design of steel girders are highlighted.

Course Leaders:
Gilbert Grondin, Ph.D., P.Eng., Senior Bridge Engineer, AECOM
Paul J. King, M.S., P.Eng., VP Engineering, Rapid-Span Structures Ltd.
James Montgomery, Ph.D., P.Eng., Principal, DIALOG
Terri Meyer Boake, M.Arch., LEED AP, Professor of Architecture, University of Waterloo

STEELDAY IS SEPTEMBER 16, 2016: SIGN UP AS A HOST TODAY AND PROFILE YOUR BUSINESS!

CISC is pleased to present SteelDay 2016 – an annual, national event that showcases the versatility, performance, and sustainability of steel and its various innovative applications. From coast to coast, our members and associates will open their facilities, job sites, and offices to offer tours and demonstrations.

SteelDay is a great way to grow your business! Register to be a Host today at SteelDay.ca and take advantage of the opportunities to showcase you company, facilities, and projects; network with key industry decision makers; develop new business opportunities; and support the steel industry. Register at steelday.ca.

REGISTER NOW FOR THE CISC 87TH ANNUAL CONFERENCE AND NATIONAL DESIGN AWARDS, SEPTEMBER 27-30

This exciting four-day event offers a comprehensive program that is packed with multiple social and networking events such as our Chairman's Reception, Steel Sponsors Reception, and Fun Night, inspiring keynote sessions and engaging presentations, a membership engagement and marketing workshop, and a grand finale with our prestigious National Design Awards Gala.
Register today at ciscconference.ca.

SPONSOR THE CISC ANNUAL CONFERENCE

Don't miss the chance to network and profile your products and services to over 300 steel industry leaders and delegates from Canada's leading consulting firms. Download the sponsorship package at cisc-icca.ca.

NEW! CISC NATIONAL STEEL SYMPOSIUM FOR THE CONSTRUCTION INDUSTRY ON SEPT 29TH, 2016. REGISTER NOW!

Don't miss this exciting multi-track education day with dynamic sessions featuring the latest topics in steel design and construction. Registration is now open! Visit ciscsymposium.ca to register.

NEW CISC HANDBOOK OF STEEL CONSTRUCTION, 11TH EDITION

The new edition features the latest updates to reflect changes to CSA S16-14 and the structural section data. It is intended to be used in conjunction with the National Building Code of Canada 2015. Buy it today at www.cisc-icca.ca.

NEW CISC CODE OF STANDARD PRACTICE, 8TH EDITION

CISC is pleased to launch our new Code of Standard Practice for Structural Steel, 8th edition, available as a free download on our website. The CISC Code of Standard Practice for Structural Steel is a compilation of usual industry practices relating to the design, fabrication, and erection of structural steel.

The following topics have undergone major revisions in the 8th edition: conditions where lintels are included in a steel contract, computations of units and mass, erection stability, temporary bracing, and Electronic documents (BIM, Appendix J). Download your copy today at cisc-icca.ca/solutions-centre/publications.

EXPLORE THE LATEST TECHNICAL RESOURCES ON STEEL KNOWLEDGE.CA

Our new blog features posts on current technical topics, addresses complex questions on steel design and construction, provides updates on new provisions and changes in building codes and standards, and features industry news such as the introduction of new steel products.

Visit Steelknowledge.ca today to explore the latest tools and resources we have available for you!

SAVE THE DATE: THE NEXT BC REGIONAL MEETING AND GOLF DAY IS ON JULY 26, 2016

Slated for July 26th at Northview Golf & Country Club in Surrey. Registration opens soon.

SAVE THE DATES: QUEBEC STEEL SYMPOSIUM AND QUEBEC STEEL DESIGN AWARDS OF EXCELLENCE

The 8th edition of the Québec Steel Symposium will take place on October 25, 2016. On the occasion of the inauguration of the Chair of Leadership in Education (CLE) in Structural Steel, this year the Quebec Steel Symposium will be held at Laval University in Quebec in collaboration with the (CLE) - André Picard. Visit rendezvousacier.com/program for more.

The CISC Quebec Steel Design Awards of Excellence will be held on November 4, 2016. See 300+ participants representing more than fifty companies from across Quebec, 60+ project submissions, 30+ finalists, and 9 winners.

For more information, please contact Hellen Christodoulou at (514) 909-6186 or visit rendezvousacier.com/prix-excellence.

COMMON CODES AND STANDARDS FOR DESIGN AND CONSTRUCTION OF STEEL STRUCTURES

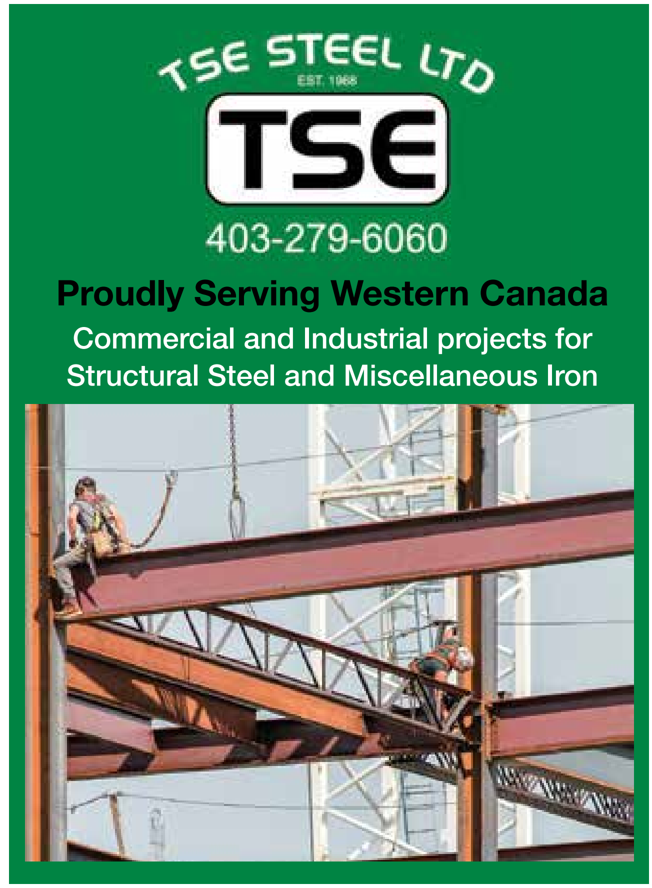
Current Status and Future Publication Targets

Code/Standard/Supplement/ Commentary/Referenced Document	Current Edition	Next Edition/Revision	Publication Target
National Building Code of Canada (NBC)	NBC 2015	NBC 2020	Dec. 2020
NBC Structural Commentaries (Part 4 of Div. B)	NBC 2010 Str. Comm.	NBC 2015 Str. Comm.	late 2016
CSA S16 Design of Steel Structures	CSA S16-14	CSA S16-19	2019
CISC Commentary on CSA S16 (Part 2 of CISC Handbook of Steel Construction)	CISC Handbook 11th Edition[1]	TBA	Early Spring, 2016
CISC Moment Connections for Seismic Applications	2nd Edition[2]	TBA	
CSA S6 Canadian Highway Bridge Design Code	CSA S6-14	CSA S6-19	
CSA S6.1 Commentary on Canadian Highway Bridge Design Code	CSA S6.1-14	CSA S6.1-19	2015
CSA G40.20/G40.21 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel	G40.20-13 G40.21-13	TBA	
CSA W59 Welded Steel Construction (Metal Arc Welding)	CSA W59-13	TBA	
CSA W47.1 Certification of Companies for Fusion Welding of Steel	CSA W47.1-09 (R2014)	TBA	
CSA S136 North American Specification for the Design of Cold-Formed Steel Structural Members	CSA S136-12	CSA S136-16	Sep. 2016
CSA S136.1 Commentary on CSA S136	CSA S136.1-12	TBA	

[1]*CISC Handbook of Steel Construction - 11th Edition includes CSA S16-14, its Commentary, CISC Code of Standard Practice - 8th Edition (new), and design and detailing aids in accordance with CSA S16-14*

[2]*Adopted in S16-14 by reference*


SPECIALIST :
H.S.S.TUBES
AND STRUCTURAL
PIPE
ALTITUBE Steel Inc.
2555 Francis-Hughes, Laval, QC H7S 2H7
(514) 637-5050 - (450) 975-TUBE (8823)
ROUND - SQUARE - RECTANGULAR
www.altitube.com
North American Steel Alliance
cisc icca


TSE STEEL LTD
EST. 1968
TSE
403-279-6060
Proudly Serving Western Canada
Commercial and Industrial projects for
Structural Steel and Miscellaneous Iron


cisc icca
QUALITY CERTIFIED
CWB
CERTIFIED
DIVISION 2
aclsteel Ltd.
www.aclsteel.ca
519.568.8822
2255 Shirley Drive
Kitchener, ON, N2B 3X4
ISO 9001 : 2008 Registered

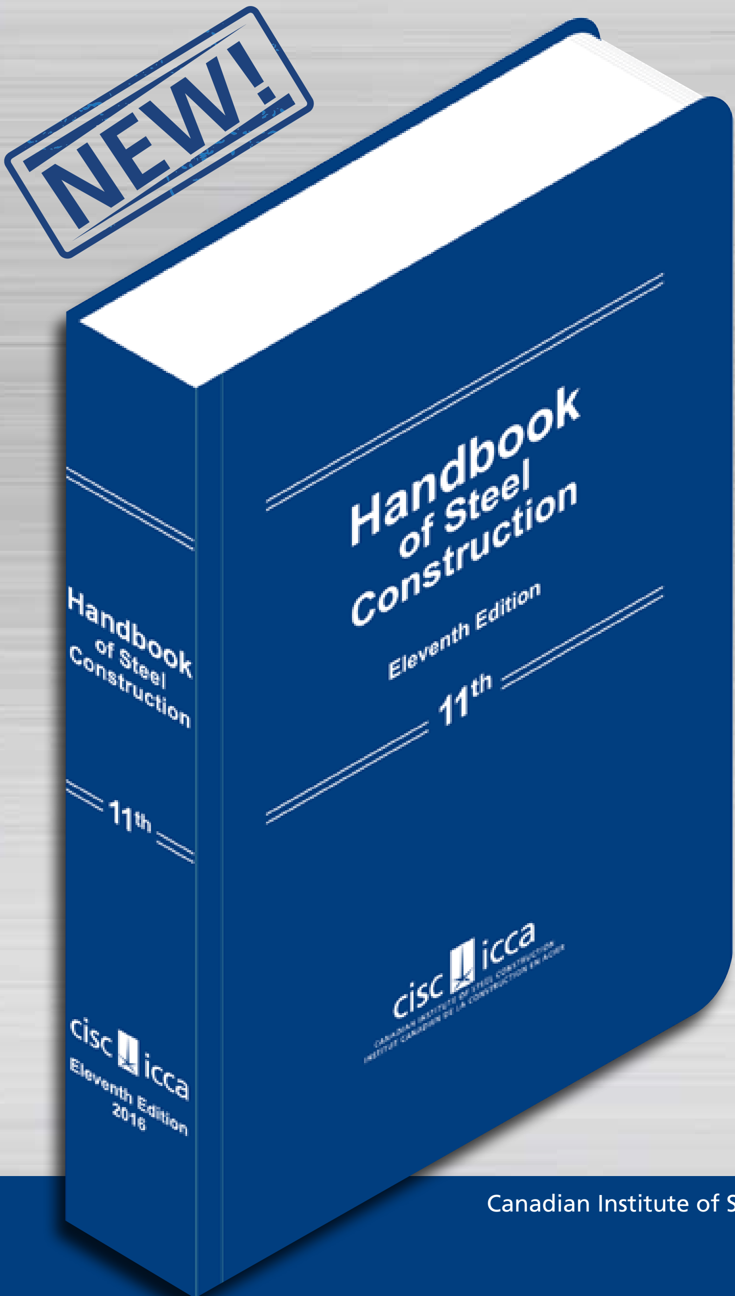

moore
BROTHER'S
Since 2000
Moore Brothers Transport Ltd.
1834 Drew Road | Mississauga, ON L5S 1J6
Tel: 905-673-6730 | Fax: 905-673-8680
Cell: 416-771-3396 | Toll Free: 1-866-279-7907
Email: smoore@moorebrothers.ca
www.moorebrothers.ca

cisc icca

CANADIAN INSTITUTE OF STEEL CONSTRUCTION
INSTITUT CANADIEN DE LA CONSTRUCTION EN ACIER

Handbook of Steel Construction 11th Edition

The Handbook of Steel Construction contains detailed information on the design and detailing of structural steel in metric units. The new 11th Edition is intended to be used together with the National Building Code of Canada 2015. Member design tables are based on steel grades ASTM A992, A572 Grade 50, A913 Grade 65, A500 Grade C and CSA G40.21-350W.



Updates in the 11th Edition:

- Includes CSA Standard S16-14 "Design of Steel Structures".
- Updated design data for common connections.
- Updated design data for twist-off bolt assemblies and direct tension indicators.
- New design table for all-bolted single-angle beam connections.
- Readily available wide-flange sizes are highlighted in yellow colour throughout the book.
- New tables for columns produced to ASTM A913 Grade 65 steel and for single-angle struts.
- Design and detailing data for anchor rods and accessories.
- Member design tables for angles and channels increased from 300 to 350 MPa yield stress.
- Structural section data for hot-rolled sections has been completely updated.
- Updated range of HSS sizes reflecting availability and including large (Jumbo) sections.
- Includes CISC Code of Standard Practice, 8th Edition, with updated provisions on erection stability and Building Information Modelling (BIM).
- Enhanced colour scheme for easier navigation.

Canadian Institute of Steel Construction / Institut canadien de la construction en acier
Phone / Tél: 905-604-3231 • info@cisc-icca.ca

cisc-icca.ca

follow us on: @cisc_icca linkedin.com/company/986081

Membership list as of June 15, 2016

Legend:
**sales office only*
B Buildings
Br Bridges
S Structural
P Platework
J Open-web Steel Joist

MEMBERS

STEEL FABRICATOR ATLANTIC

Cherubini Metal Works Limited B, Br, P, S
Dartmouth, NS 902-468-5630
www.cherubinigroup.com

Eascan Building Systems Ltd. S
Truro, NS 902-897-9553
www.eascan.ca

Gerrys Welding & Fabrication Inc. B, S
St-John, NB 506-642-3704

MacDougall Steel Erectors Inc. B, P, S
Borden-Carleton, PE 902-855-2100
www.macdougallsteel.com

Marid Industries Limited B, S
Windsor Junction, NS 902-860-1138
www.marid.ca

Modular Fabrication Inc. Br, S
Miramichi, NB 506-622-1900
www.modularfab.com

MQM Quality Manufacturing Ltd. P, S
Tracadie-Sheila, NB 506-395-7777
www.mqm.ca

Ocean Steel & Construction Ltd.
Fredericton, NB 506-444-7989
www.oceansteel.com

Ocean Steel & Construction Ltd. B, Br, P, S
Saint John, NB 506-632-2600
www.oceansteel.com

Prebilt Structures Ltd.
Charlottetown, PE 902-892-8577
www.prebiltsteel.com

RKO Steel Limited B, Br, S
Amherst, NS

RKO Steel Limited Plant 1 B, P, S
Dartmouth, NS 902-468-1322

RKO Steel Limited Plant 2
Dartmouth, NS

RKO Steel Limited
Riverview, NS

Tek Steel Ltd. S
Fredericton, NB 506-452-1949

QUEBEC

Acier Métaux Spec. inc. S
Chateauguay, QC 450-698-2161
www.metauxspec.ca

Acier Robel inc. S
St-Eustache, QC 450-623-8449
www.acierrobel.com

Canam-Bridges, a division of Canam Group Inc. B, S
Laval, QC 450 786-1300
www.canambridges.com

Canam-Bridges, a division of Canam Group Inc. P, S
Québec, QC 418-683-2561
www.canambridges.com

Canam-Buildings, a division of Canam Group Inc. J, S
St-Gédéon, QC 418-228-8031
www.canam-construction.com

Canam-Heavy, a division of Canam Group Inc. J, S
Boucherville, QC 450-641-4000
www.canamheavy.com

Canmec La Baie B, Br
La Baie, QC 418-544-3319
www.canmec.com

Constructions PROCO Inc. S
St. Nazaire, QC 418-668-3371
www.proco.ca

Lainco Inc. B, Br, S
Terrebonne, QC 450-965-6010

Les Aciers Fax inc. B, S
Charlesbourg, QC 418-841-7771

Les Charpentes d'acier Sofab Inc. S
Boucherville, QC 450-641-2618
www.sofab.ca

Les Constructions Beauce-Atlas Inc. - Plant 1 S
Ste-Marie de Beauce, QC 418-387-4872
www.beauceatlas.ca

Les Constructions Beauce-Atlas Inc. - Plant 2 Br
Ste-Marie de Beauce, QC

Les Industries V.M. Inc. S
Longueuil, QC 450-651-4901
www.industriesvm.com

Les Structures C.D.L. Inc. S
St-Romuald, QC 418-839-1421
www.structurescdl.com

Les Structures G.B. Ltée P, S
Rimouski, QC 418-724-9433
www.structuresgb.com

Métal Moro inc S
Montmagny, QC 418-248-1018

Métal Perreault Inc. B, P, S
Donnacona, QC 418-285-4499
www.metalperreault.com

Mometal Structures Inc. B, S
Varennes, QC 450-929-3999
www.mometal.com

NGA Structure Inc. B, S
Drummondville, QC 819-477-6891
www.nga.qc.ca

Produits Métalliques PMI S
Rimouski, QC 418-723-2610
www.pmistructures.com

Quirion Métal Inc. S
Beauceville, QC 418-774-9881
www.quirionmetal.com

Structures XL B, Br, J
Terrebonne, QC 450-968-0800

Sturo Metal Inc. S
Lévis, QC 418-833-2107
www.sturometal.com

Supermétal Structures Inc. P, S
St-Romuald, QC 418-834-1955
www.supermetal.com

Tecno Metal Inc. B, S
Quebec, QC 418-682-0315
www.tecnometal.ca

ONTARIO

AC Metal Fabricating Ltd. S
Oldcastle , ON 519-737-6007

ACL Steel Ltd. S
Kitchener, ON 519-568-8822
www.aclsteel.ca

Akal Steel (2005) Inc.
Brampton, ON 905-458-7555
www.akalsteel.ca

Arkbro Structures S
Mississauga, ON 905-766-4038
www.arkbrostructures.com

Benson Steel Limited J, S
Bolton, ON 905-857-0684
www.bensonsteel.com

Burnco Mfg. Inc. Br, S
Concord, ON 905-761-6155
www.burncomfg.com

C & A Steel (1983) Ltd. S
Sudbury, ON 705-675-3205
www.casteel1983.com

C_ore Metal Inc. S
Oakville, ON 905-829-8588
www.coremetal.com

Canam-Buildings, a division of Canam Group Inc. J, S
Mississauga, ON 905-671-3460
www.canam-construction.com

Central Welding & Iron Works Group B, Br, P, S
North Bay, ON 705-474-0350
www.centralwelding.ca

Cooksville Steel Limited S
Kitchener, ON 519-893-7646
www.cooksvillesteel.com

Cooksville Steel S
Mississauga, ON 905-277-9538
www.cooksvillesteel.com

D & M Steel Ltd. S
Newmarket, ON 905-836-6612

Eagle Bridge Inc. Br, S
Kitchener, ON 519-743-4353
www.eaglebridge.ca

Fortran Steel Contracting Ltd. S
Ottawa, ON 613-821-4014
www.fortransteel.com

G & P Welding and Iron Works P, S
North Bay, ON 705-472-5454
www.gpwelding.com

Gensteel - Division of Austin Steel Group Inc. S
Brampton, ON 905-799-3324
www.gensteel.ca

Hopkins Steel Works Limited B, S
Welland, ON 905-732-6018
www.supremegroup.com

IBL Structural Steel Limited B
Mississauga, ON 905-671-3301
www.iblsteel.com

Lambton Metal Services S
Sarnia, ON 519-344-3939
www.lambtonmetalservice.ca

Laplante Welding of Cornwall Inc. S
Cornwall, ON 613-938-0575
www.laplantewelding.com

Linesteel (1973) Limited B, S
Barrie, ON 705-721-6677
www.linesteel.com

Lorvin Steel Ltd. S
Brampton, ON 905-458-8850
www.lorvinsteel.com

M&G Steel Ltd. S
Oakville, ON 905-469-6442
www.mgsteel.ca

M.I.G. Structural Steel (Div. of 3526674 Canada Inc.) S
St-Isidore, ON 613-524-5537
www.migsteel.com

Mariani Metal Fabricators Limited S
Etobicoke, ON 416-798-2969
www.marianimetal.com

Mirage Steel Limited
Brampton, ON 905-458-7022
www.miragesteel.com

Norak Steel Construction Limited S
Concord, ON 905-669-1767
www.noraksteel.com

Paradise Steel Fab. Ltd. S
Etobicoke, ON 905-770-2121

Pittsburgh Steel Group S
Mississauga, ON 905-362-5097
www.pittsburghsteel.com

Quad Steel Inc. S
Bolton, ON 905-857-9404
www.quadsteel.ca

Shannon Steel Inc. S
Orangeville, ON 519-941-7000
www.shannonsteel.com

Steelcon Fabrication Inc. B
Brampton, ON 416-798-3343
www.steelcon.ca

Telco Steel Works Ltd. S
Guelph, ON 519-837-1973
www.telcosteelworks.ca

Trade-Tech Industries, Inc. B, P, S
Bowmanville, ON 905-623-5060
www.tradetech.ca

Tresman Steel Industries Ltd. S
Mississauga, ON 905-795-8757
www.tresmansteel.com

Trevco Steel Ltd. B
Bolton, ON 905-857-8233
www.trevcosteel.ca

Victoria Steel Corporation S
Oldcastle, ON 519-737-6151

Walters Inc. Br, P, S
Hamilton, ON 905-388-7111
www.waltersinc.com

Walters Inc. B, P, S
Princeton, ON
www.waltersinc.com

Walters Inc. B, P, S
Stoney Creek, ON
www.waltersinc.com

MANITOBA

Abesco Ltd. S
Winnipeg, MB 204-667-3981

Behlen Industries LP B, Br
Brandon, MB 204-728-1188
www.behlen.ca

Capitol Steel Corp. Br, S
Winnipeg, MB 204-889-9980
www.capitolsteel.ca

Coastal Steel Construction Limited P, S
Thunder Bay, ON 807-623-4844
www.coastalsteel.ca

Shopost Iron Works (1989) Ltd. S
Winnipeg, MB 204-233-3783
www.shopost.com

Sperling Industries Ltd. B, Br, P, S
Sperling, MB 204-626-3401
www.sperlingind.com

Supreme Steel LP - B, S
Winnipeg, MB 204-589-7371
ww.supremegroup.com

SASKATCHEWAN

Anlin Welding & Steel Fabrication B, S
Regina, SK 306-721-6566
www.anlinwelding.com

Avanti Steel Fabricators Ltd.
Regina, SK 306-352-1650
www.avantisteel.com

Elance Steel Fabricating Co. Ltd. S
Saskatoon, SK 306-931-4412
www.elancesteel.com

IWL Steel Fabricators Ltd. B, P, S
Martensville, SK 306-242-4077

IWL Steel Fabricators Ltd B, P, S
Saskatoon, SK 306-242-4077
www.iwlsteel.com

Supreme Steel LP P, S
Saskatoon, SK 306-975-1177
http://www.supremegroup.com

Weldfab Ltd. S
Saskatoon, SK 306-955-4425
www.weldfab.com

ALBERTA

Bow Ridge Steel Fabricating S
Calgary, AB 403-230-3705

C.W. Carry (1967) Ltd. P, S
Edmonton, AB 780-465-0381
www.cwcarry.com

Canam-Buildings, a division of Canam Group Inc. J, S
Calgary, AB 403-252-7591
www.canam-construction.com

Collins Industries Ltd. S
Edmonton, AB 780-440-1414
www.collins-industries-ltd.com

Eskimo Steel Ltd. P, S
Sherwood Park, AB 780-417-9200
www.eskimosteel.com

Garneau Manufacturing Inc. S
Morinville, AB 780-939-2129

Hranco Industries Ltd. Br, P, S
Medicine Hat, AB 403-527-4190
www.hranco.com

Hyduke Drilling Solutions
Nisku, AB 780-955-0360

JV Driver Fabricators Inc. B, S
Nisku, AB 780-955-1746
www.jvdriver.com

Leder Steel Limited S
Acheson, AB 780-962-9040
www.ledersteel.com

Norfab Mfg (1993) Inc. B, P, S
Edmonton, AB 780-447-5454

Northern Weldarc Ltd. P, S
Sherwood Park, AB 780-467-1522
www.northern-weldarc.com

Omega Joists, a division of ROLL FORM GROUP of SAMUEL MANU-TECH INC. J
Nisku, AB 780-955-3390
www.omegajoists.com

Precision Steel & Manufacturing Ltd. S
Edmonton, AB 780-449-4244
www.precisionsteel.ab.ca

Rampart Steel Ltd. S
Edmonton, AB 780-465-9730
www.rampartsteel.com

Rapid-Span Bridges Inc. Br
County of Grande Prairie No. 1, AB 780-538-9199

RIMK Industries Inc. B, S
Calgary, AB 403-236-8777

Sierra Fabricating and Manufacturing S
Devon, AB 780-987-2676

Spartan Steel S
Edmonton, AB 780-435-3807

Supermétal Structures Inc., Western Division P, S
Leduc, AB 780-980-4830
www.supermetal.com

Supreme Steel LP S
Acheson, AB
www.supremegroup.com

Supreme Steel LP P, S
Edmonton, AB 780-483-3278
www.supremegroup.com

Supreme Steel LP, Bridge Division B, Br, P, S
Edmonton, AB 780-467-2266
www.supremegroup.com

Triangle Steel (1999) Ltd. P, S
Calgary, AB 403-279-2622
www.trianglesteel.com

TSE Steel Ltd. S
Calgary, AB 403-279-6060
www.tsesteel.com

W.F. Welding & Overhead Cranes Ltd. S
Nisku, AB 780-955-7671
www.wfwelding.com

Waiward Steel LP P, S
Edmonton, AB 780-469-1258
www.waiward.com

Whitemud Ironworks Limited S
Edmonton, AB 780-701-3295
www.whitemudgroup.ca

BRITISH COLUMBIA

Canron Western Constructors LP B, Br, P, S
Delta, BC 604-524-4421
www.supremegroup.com

George Third & Son P, S
Burnaby, BC 604-526-2333
www.geothird.com

Impact Ironworks Ltd. B, S
Surrey, BC 604-888-0851

JP Metal Masters 2000 Inc. B, Br, J, P, S
Maple Ridge, BC 604-465-8933
www.jpmetalmasters.com

Rapid-Span Structures Limited Br, P
Armstrong, BC 250-546-9676
www.rapidspan.com

Solid Rock Steel Fabricating Co. Ltd. S
Surrey, BC 604-581-1151
www.solidrocksteel.com

Warnaar Steel Tech Ltd. S
Kelowna, BC 250-765-8800
www.warnaarsteel.com

Wesbridge Steelworks Limited S
Delta, BC 604-946-8618
www.wesbridge.com

West Coast Steel Ltd. B, Br
Coquitlam, BC 604-554-0171
www.westcoaststeel.ca

XL Ironworks Co. J, S
Surrey, BC 604-596-1747
www.xliron.com

SERVICE CENTRE OR STEEL WAREHOUSE

A.J. Forsyth, A Division of Russel Metals Inc.
Delta, BC 604-525-0544
www.russelmetals.com

Acier Leroux Boucherville, Division de Métaux Russel Inc.
Boucherville, QC 450-641-2280
www.leroux-steel.com

Acier Pacifique Inc.
Laval, QC 514-384-4690
www.pacificsteel.ca

Custom Plate & Profiles Ltd. a div. of Samuel, Son Co. Ltd
Delta, BC 604-524-8000
www.customplate.net
Cut to size steel plate in various grades to 12" thick. Stock size sheets of plate to 12"

Dymin Steel (Western) Inc.
Abbotsford, BC 604-852-9664
www.dymin-steel.com

Dymin Steel Inc.
Brampton, ON 905-840-0808
www.dymin-steel.com

Dymin Steel Inc.
Nisku, AB 780-979-0454
www.dymin-steel.com

Metalium Inc.
Laval, QC 450-963-0411
www.metalium.com

Price Steel Ltd.
Edmonton, AB 780-447-9999
www.pricesteel.com

Russel Metals Inc.
Edmonton, AB 780-439-2051
www.russelmetals.com

Russel Metals Inc.
Lakeside, NS 902-876-7861
www.russelmetals.com

Russel Metals Inc.
Mississauga, ON 905-819-7777
www.russelmetals.com

Russel Metals Inc.
Saskatoon, SK 306-931-3338

Russel Metals Inc.
Winnipeg, MB 204-772-0321
www.russelmetals.com

Salit Steel (Division of Myer Salit Limited)
Niagara Falls, ON 905-354-5691
www.salitsteel.com

Samuel, Son & Co., Limited
Delta, BC 604-524-8000
www.customplate.net

Samuel, Son & Co., Limited
Laval, QC 514-384-5220
www.samuel.com

Samuel, Son & Co., Limited
Hamilton, ON 1-866-972-6835
www.samuel.com

Samuel, Son & Co., Limited
Mississauga, ON 905-279-5460
www.samuel.com

VARSTEEL Ltd.
Delta, BC 604-946-2717
www.varsteel.ca
Beam, angle, channel, HSS plate, sheet, expanded metal, pipe flats, rounds etc.

VARSTEEL Ltd.
Lethbridge, AB 403-320-1953
www.varsteel.ca
Beam, angle, channel, HSS plate, sheet, Grating, expanded metal, pipe, flats, rounds etc.

VARSTEEL Ltd.
Nisku, AB 780-955-1953
www.varsteel.ca

VARSTEEL Ltd.
Saskatoon, SK 360-955-3777
www.varsteel.ca

Wilkinson Steel and Metals, Division of Samuel, Son & Co., Limited
Edmonton, AB 780-434-8441
www.wilkinsonsteel.com

Wilkinson Steel and Metals, Division of Samuel, Son & Co., Limited
Saskatoon, SK 306-652-7151
www.wilkinsonsteel.com

York-Ennis, A Division of Russel Metals Inc.
Mississauga, ON 905-819-7297
www.russelmetals.com

STEEL MILL PRODUCER

Atlas Tube Canada ULC
Harrow, ON 519-738-5000
www.atlastube.com

Essar Steel Algoma Inc.
Sault Ste. Marie, ON 705-945-2351
www.essarsteelalgoma.com

Gerdau Corporation
Whitby, ON 905-668-8811
www.gerdau.com/longsteel

DETAILER

A.D. Drafting B
Brampton, ON 905-488-8216

A-1 Detailing and Engineering Ltd. B, P
Nackawic, NB 506-575-1222

Acier MCN/MCN Steel J, P, S
Ville St-Laurent, QC 514-508-6871
www.mcnsteel.com

Acklam Drafting Service B, Br, S
Tecumseh, ON 519-979-1674

Aerostar Drafting Services B
Georgetown, ON 905-702-7918

Apex Structural Design Ltd. B
Red Deer, AB 403-343-2001
www.apexstructural.ca

Base Line Drafting Services Inc. B
Concord, ON 905-660-7017
www.bld.ca

BBK Steel Detailing Inc. B
Hamilton, ON 905-645-0484

CADD Atla Drafting & Design B
Edmonton, AB 780-461-3550
www.caddalta.com

Draft-Tech Inc. B
Tecumseh, ON 519-979-3858
www.dtigroup.ca

Dtech Enterprises Inc. B
White Rock, BC 604-536-6572
www.dtechenterprises.com

Exact Detailing Ltd B, Br, J, P
Victoria, BC 250-590-5244
www.exactdetailing.com

Genifab Consultants Inc. B, Br
Quebec, QC 418-622-1676
www.genifab.com

Haché Technical Services Ltd./Haché Services Techniques Ltée B, P
Caraquet, NB 506-727-7800

Husky Detailing Inc. B
London, ON 519-850-9802
www.huskydetailing.com

iGL inc. B
Trois-Rivières, QC 888-573-4982

IKONA Drafting Services Inc.
Regina, SK 306-522-2650

INFocus Detailing Inc. B, Br, P
Kemble, ON 519-376-8717
www.infocusdetailing.com

IRESCO Ltd. B
Edmonton, AB 780-433-5606
www.steeldetailers.com

JCM & Associates Limited B, P
Frankford, ON 613-398-6510
www.jcmdrafting.com

JP Drafting Ltd. B, Br, J, P
Maple Ridge, BC 604-465-8933
www.jpdrafting.com

KGS Group Steel Detailing Division B
Winnipeg, MB 204-896-1209
www.kgsgroup.com

Lancor Structural Design Ltd. B
Shediac, NB 506-532-0838
www.lancorstructural.com

Les Dessins de Structure Steltec Inc. B, Br, P
Ste-Thérèse, QC 450-971-5995
www.steltec.ca

Les Dessins Trusquin Inc. B, Br
Boisbriand, QC 450-420-1000
www.trusquin.com

Les Systèmes Datadraft Inc., Datadraft Systems Inc. B
Boisbriand, QC 514-748-6161
www.datadraft.com

M & D Management Consulting Ltd. B
Parksville, BC 250-248-4871

M-Tec Drafting Services Inc. B, Br, P
Sherwood Park, AB 780-467-0903
www.mtecdrafting.com

ProDraft Inc. B, Br, P
Surrey, BC 604-589-6425
www.prodraftinc.com

Ranmar Technical Services Ltd. B, P
Mt. Pearl, NL 709-364-4158
www.ranmartech.com

River City Detailers Limited B
Winnipeg, MB 204-221-8420
www.rivercitydetailers.com

Service Technique Asimut inc
Charny, QC 418-988-0719
www.asimut.ca

Spec 5 Services Inc. B, P
South Tetagouche, NB 506-546-2121
www.spec5services.com

Summyx inc. Br, S
Ste-Marie, Beauce, QC 418-386-5484
www.summyx.com

TDS Industrial Services Ltd. B, P
Prince George, BC 250-561-1646
www.tdsindustrial.com

Techdess Inc. B
Saint-Jérôme, QC 450-569-2629
www.techdess.com

Tenca Steel Detailing Inc. Br
Charlesbourg, QC 418-634-5225
www.tencainc.com

Vet Dessin
Terrebonne, QC 450-477-1000
www.vetdessin.com

STEEL AFFILIATE

CWB Group/Le Groupe CWB
Milton, ON 905-542-1312
www.cwbgroup.org

ASSOCIATES

STEEL FABRICATOR

Acier Charron Ltée
Boisbriand, QC 450-434-1890
www.aciercharron.com

A-Post Aluminum Fabricators
Winnipeg, MB 204-663-8800
www.a-post.com

CB Metal Works Inc
Avondale, NL 709-229-1099

CC Industries
Saskatoon, SK 306-374-8228
www.ccindustries.ca

Century Steel Fabrications
Winnipeg, MB 204-233-3300

CNS Fabrication Ltd.
Bolton, ON 780-980-2001

Coquitlam Steel Products Ltd.
Port Coquitlam, BC 778-387-8294
coquitlamsteel.com

Ed Lau Ironworks Limited
Kitchener, ON 519-745-5691

EZ-Steel (A division of Quirion Metal)
Leduc, AB 780-980-2001
www.ezsteel.ca

Ganawa Bridge Products and Services
780-980-2001
Ajax, ON 905-686-5203
www.ganawa.ca

Headsteel Ltd.
Headingley, MB 204-831-1115
www.headsteel.ca/

I & M Welding & Fabricating Ltd.
Saskatoon, SK 306-955-4546

JCT Metals Inc.
Strathroy, ON 519-518-0246
www.jctmetalsinc.com

Les Ateliers Ferroviaires de Mont-Joli Inc. (a division of SEMA Railway Structures)
Sainte-Flavie, QC 418-775-7141
www.sema.ca

NorthWest Fabricators Ltd.
Athabasca, AB 780-675-4900

Nor-Weld Ltd.
Orillia, ON 705-326-3619
www.norweld.com

Old Tymer Welding
Orillia, ON 705-327-1964
www.oldtymerwelding.com

Payford Steel Inc.
Thunder Bay, ON 807-577-8455
www.payfordsteel.com

Petro-Chem Fabricators Ltd.
Edmonton, AB 780-414-6701

Show Canada
Laval, QC 450-664-5155
www.show-canada.com

Times Iron Works Inc.
Pickering, ON 905-831-5111
www.timesironworks.ca

ERECTOR

Arcweld Industries Inc. B, Br, J, P, S
Winnipeg, MB 204-661-3867
www.arcweld.ca

D.R. Steel Inc. B, J
Edmonton, AB 780-699-9872

E.S. Fox Limited B, Br, J, P, S
Niagara Falls, ON 905-354-3700
www.esfox.com

K C Welding Ltd. B
Angus, ON 705-424-1956

KWH Constructors Ltd. B, Br
Burnaby, BC 604 629 4897

M-C Steel Services Inc. B, Br, J, P, S
Bowmanville, ON 905-623-0388
www.mccormickcampbell.com

Montage d'acier International - division de Gastier M.P. Inc. Br, P
Anjou, QC 514-328-6232

Montage St-Laurent B, Br
Boisbriand, QC 450-430-2212
www.montacier.com

Niagara Rigging & Erecting Company Ltd. B, Br, J, S
Thorold, ON 289-296-4594

St. Peter Steel Inc. B
Woodbridge, ON 905-851-2817

Stampa Steel Erectors Ltd. B, Br
Concord, ON 905-760-7689
www.stampasteel.com

Superior Steel Erectors Ltd. B
Sherwood Park, AB 780-922-0520
www.superiorsteel.ca

SUPPLIER

Aarc-West Industrial Coatings Inc.
Surrey, BC 604-588-9961
www.awcoatings.com

Acier Altitube Inc. / Altitube Steel Inc.
Chomedey, Laval, QC 514-637-5050
www.altitube.com

Acier Picard inc.
St-Romuald, QC 418-834-8300
www.acierpicard.com

Advanced Bending Technologies Inc.
Langley, BC 604-856-6220
www.bending.net
Rolled or bent structural sect

Aggressive Tube Bending Inc.
Surrey, BC 604-662-4872

Agway Metals Inc.
Brampton, ON 905-799-7535
www.agwaymetals.com

Akhurst Machinery
Edmonton, AB 780-435-3936
www.akhurst.com

AkzoNobel Coatings Limited
Lively, ON 705-688-8450
www.international-pc.com

All Fabrication Machinery Ltd.
Leduc, AB 780-980-9661
www.allfabmachinery.com
Steel and plate fabrication -machinery.

Amcan Jumax Inc.
St-Hubert, QC 450-445-8888
www.amcanjumax.com

Applied Bolting Technology
Bellows Falls, Vermont USA 802-460-3100
www.appliedbolting.com

AXIS Inspection Group Ltd
Winnipeg, MB 204-488-6790
www.axisinspection.com

Behlen Industries COM-BLD Division
Edmonton, AB 780-237-8497
www.behlen.ca

Blastech Corporation
Brantford, ON 519-756-8222
www.blastech.com
Abrasive blasting, glass bead

Borden Metal Products (Canada) Limited
Beeton, ON 905-729-2229
www.bordengratings.com
Aluminum, stainless steel, steel grating

Brunswick Steel
Winnipeg, MB 204-224-1472
www.brunswicksteel.com
Steel-structures plate bars, HSS

Burlington Automation
Hamilton, ON 905-689-7771

Canadian Quality Inspections Ltd.
Winnipeg, MB 204-663-7775
www.cqinspections.ca

CANSTUD Welding And Supply Inc.
Delta, BC 604-952-4066
www.canstud.com

Cast Connex Corporation
Toronto, ON 416-806-3521
www.castconnex.com

Cloverdale Paint Inc.
Edmonton, AB 780-453-5700
www.cloverdalepaint.com
Specialty hi-performance industrial coatings and paint products

Cloverdale Paint Inc.
Surrey, BC 604-329-0703

Commercial Sandblasting & Painting Ltd.
Saskatoon, SK 306-931-2820
Sandblasting and protective coating applications

Construction Fasteners & Tools Ltd.
Saskatoon, SK 306-668-8880
www.cf-t.com

Corrcoat Services Inc., Sandblasters and Coaters
Surrey, BC 604-881-1268
www.corrcoat.ca
Sandblasters and coaters

Court Galvanizing Ltd.
Cambridge, ON 519-624-5544
www.courtgalvanizingltd.com

Cowan Insurance Group
Cambridge, ON 519-650-6363
www.cowangroup.ca

Daam Galvanizing Inc.
Edmonton, AB 780-468-6868
www.daamgalvanizing.com
Hot dip galvanizing

Daam Galvanizing Ltd.
Saskatoon, SK 306-242-2202
www.galv.ca
galvanizing services

Devoe Coatings
Edmonton, AB 780-454-4900
www.devoecoatings.com
Coating, paint

DryTec Trans-Canada
Terrebonne, QC 450-965-0200
www.drytec.ca
Grating, metallizing, paint

EBCO Metal Finishing L.P.
Richmond, BC 604-244-1500
www.ebcometalfinishing.com
Hot dip galvanizing

Endura Manufacturing Co. Ltd.
Edmonton, AB 780-451-4242
www.endura.ca
Paint and coating materials

Ficep Corporation
Forest Hill, MD 410-588-5800
www.ficepcorp.com

Fisher & Ludlow,
A Division of Harris Steel Limited
Edmonton, AB 780-481-3941
www.fisherludlow.com
Welded steel/ aluminum/stainless steel grating, "Grip Span" and "Shur Grip" safety grating

Fisher & Ludlow,
A Division of Harris Steel Limited
Surrey, BC 604-888-0911
www.fisherludlow.com
Welded steel/ aluminum/stainless steel grating, "Grip Span" and "Shur Grip" safety grating

Fisher & Ludlow,
division d'acier Harris Ltée
Pointe Aux Trembles, QC 514-640-5085
www.fisherludlow.com
Welded steel/ aluminum/stainless steel grating, "Grip Span" and "Shur Grip" safety grating

Frank's Sandblasting & Painting
Nisku, AB 780-955-2633

GE Capital Canada
Montreal, QC 514-868-2303

GRAITEC Inc.
Longueuil, QC 450-674-0657
www.graitec.com

Harsco Industrial IKG (Grating Division)
Newmarket, ON 905-953-7779
www.harsco.com

HDIM Protective Coatings
Edmonton, AB 780-482-4346
www.hdimpc.ca

Infasco
Marieville, QC 450-658-8741
www.infasco.com

Kubes Steel Inc.
Stoney Creek, ON 905-643-1229
www.kubesteel.com

La Compagnie Américaine de Fer et Métaux Inc. / American Iron & Metal Inc.
East Montréal, QC 514-494-2000
www.scrapmetal.net

La Corporation Corbec
Lachine, QC 514-364-4000
www.corbecgalv.com
Supplier of hot dip galvanizing only

Les Industries Méta-For inc.
Terrebonne, QC 450-477-6322
www.meta-for.ca

Les Soudures Giromac enr.
Papineauville, QC 819-427-5377

Lincoln Electric Company of Canada LP
Toronto, ON 416-421-2600
www.lincolnelectric.com
Welding equipment and welding

Magnus Inc.
Ste-Thérèse, QC 866-435-6366
www.magnus-mr.ca
SDS/2 Design Software

McCann Equipment Ltd.
Mississauga, ON 905-542-1333
www.torquetools.com

Metal Fabricators and Welding Ltd.
Edmonton, AB 780-455-2186
www.metalfab.ca

Midway Wheelabrating Ltd.
Abbotsford, BC 604-855-7650
www.midwaywheelabrating.com
Wheelabrating, sandblasting, industrial coatings

Moore Brothers Transport Ltd.
Mississauga, ON 905-840-9872
www.moorebrothers.ca

Nucap Industries Inc.
Toronto, ON 416-494-1444
www.gripmetal.com

Pacific Bolt Manufacturing Ltd.
New Westminster, BC 604-524-2658
www.pacbolt.com
Steel fasteners, structural bolts, anchor bolts, tie rods

PARK DEROCHIE
Edmonton, AB 780-478-4688
www.parkderochie.com

Peddinghaus Corporation
Bradley, IL 815-937-3800
www.peddinghaus.com

Peikko Canada Inc.
Quebec, QC 418-263-2023

Peinture Internationale (une division de Akzo Nobel Peintures Ltée) / International Paints (A Division of Akzo Nobel Coating Ltd.)
Dorval, QC 514-631-8686
www.international-coatings.com
Protective coatings, corrosion-resistant paints

Prodevco Industries
St-Georges, QC 418-226-4480
www.prodevcoind.com/

Red River Galvanizing Inc.
Winnipeg, MB 204-889-1861
www.redrivergalvanizing.com
Supplier of hot dip galvanizing only

Reliable Tube (Edmonton) Ltd.
Acheson, AB 780-962-0130
www.reliable-tube.com
HSS Tubing, ERW Tubing, CDSSM

Reliable Tube Inc.
Langley, BC 604-857-9861
www.reliabletube.com
Hollow structural steel tube

Selectone Paints Limited
Weston, ON 416-742-8881
www.selectonepaints.ca
Paint primers, fast dry enamels, coatings

Sherwin Williams
Saskatoon, SK 306-716-0942
www.protective.sherwin-williams.com

Silver City Galvanizing Inc.
Delta, BC 604-524-1182
Custom "hot dip' Zinc Galvanizing: Picking and Oiling

Solutions Consortech inc.
Brossard, QC 450-676-1555
www.consortech.com
logiciels autodesk et services professionels sur ces logiciels

Steel Plus Network Inc.
Edmonton, AB 780-756-7959
http://www.steelplus.com

SteelWare Solutions Ltd
Edmonton, AB
www.steelwaresolutions.com 780-328-7700

Supreme Galvanizing Ltd
Brampton, ON 905-450-7888
http://www.supremegalvanizing.com

Terraprobe Inc.
Brampton, ON 905-796-2650
www.terraprobe.ca

The Blastman Coatings Ltd.
Brampton, ON 905-450-0888
www.blastmancoatings.com

The Sherwin-Williams Company
Ville d'Anjou, QC 514-356-1684
www.sherwin.com
Specialty industrial coatings

Tuyaux et Matériel de Fondation Ltée / Pipe and Piling Supplies Ltd.
St. Hubert, QC 450-445-0050
www.pipe-piling.com
Hot Roll-Wide-Flange-Bearing Pile Beams

Vectorbloc Corp.
Toronto, ON 416-766-9018
www.vectorbloc.com

Vicwest Building Products
Delta, BC 604-946-5316
www.vicwest.com
Steel metal floor/roof deck, wall and roof cladding

Vicwest Building Products
Edmonton, AB 780-454-4477
www.vicwest.com
Steel metal foor/roof deck, wall and roof cladding

Vicwest Building Products
Memramcook, NB 506-758-8181
www.vicwest.com
Steel metal floor/roof deck, wall and roof cladding

Vicwest Building Products
Oakville, ON 905-825-2252
www.vicwest.com

Vicwest Building Products
Winnipeg, MB 204-669-9500
www.vicwest.com
Steel metal floor/roof deck, wall and roof cladding

Vixman Construction Ltd.
Rockwood, ON 519-856-2000
www.vixman.com
Roof and floor deck

Voortman USA Corporation
Manteno, IL 815-468-6300
www.vortmancorp.com

Western Industrial Services Ltd. (WISL)
Winnipeg, MB 204-956-9475
www.wisl.ca
Abrasive blasting & painting services

STEEL MILL PRODUCER

ArcelorMittal International Canada
Chicago, IL 905-320-6649
www.arcelormittal.com

Nucor-Yamato Steel Company
Blytheville, AR 870-762-5500
www.nucoryamato.com

BUILDER OR STAKEHOLDER

Impact Canada
Regina, SK 306-536-0442
www.ironworkerswesterncanada.org

Impact Canada
St. Albert, AB 780-459-3389
www.impact-net.org

Ironworkers International
Coquitlam, BC 614-313-8678
www.ironworkers.org

Ironworkers Local 97
Burnaby, BC 604-879-4191
www.ironworkerslocal97.com

Ironworkers Local Union 728
Winnipeg, MB 204-783-7853
www.ironworkers728.com/

Ontario Erectors Association
Collingwood, ON 705-445-9415
www.ontarioerectors.com/

CONSULTANT COMPANY

Adjeleian Allen Rubeli Ltd.
Ottawa, ON 613-232-5786

AECOM Canada Ltd., Québec, QC 418-648-9512

AECOM Canada Ltd., Whitby, ON 905-668-9363

Aecom Consultants Inc., Montréal, QC 514-287-8500

Amec Foster Wheeler, Vancouver, BC 604-664-5920

Amec Foster Wheeler Americas Limited
Trail, BC 250-368-2407

Amec Foster Wheeler Americas Limited
Dartmouth, NS 902-420-8924

Amec Foster Wheeler Inc.,
Saskatoon, SK 306-477-1155

ARUP, Toronto, ON 416-515-0915

Associated Engineering (B.C.) Ltd.
Burnaby, BC 604-293-1411

Atkins + Van Groll Inc., Toronto, ON 416-489-7888

Axys Consultants inc.
Sainte-Marie de Beauce, QC 418-387-7739

Bantrel, Calgary, AB 780-462-5000

BAR Engineering Co. Ltd.
Lloydminster, AB 780-875-1683

Blackwell Bowick Partnership Ltd.
Toronto, ON 416-593-5300

BMR Structural Engineering
Halifax, NS 902-429-3321

BPTEC Engineering Ltd., Edmonton, AB 780-436-5376

Brenik Engineering Inc., Concord, ON 905-660-7732

Bureau d'études spécialisées inc.
Montréal, QC 514-393-1500

Byrne Engineering Inc., Burlington, ON 905-632-8044

Calculatec Inc., Montréal, QC 514-525-2655

CBCL Limited, Halifax, NS	506-450-9441
CIMA+, Québec, QC	418-623-3373
CIMA+ Partenaire de génie, Laval, QC	514-337-2462
CPE Structural Consultants Ltd. Toronto, ON	416-447-8555
Crosier Kilgour & Partners Ltd. Winnipeg, MB	204-943-7501
CWMM Consulting Engineers Ltd. Vancouver, BC	604-868-2308
D'Aronco, Pineau, Hébert, Varin Laval, QC	450-969-2250
Dessau Inc., Montréal, QC	514-281-1033
Dialog Design, Edmonton, AB	780-429-1580
Dorlan Engineering Consultants Inc. Mississauga, ON	905-671-4377
DTI Structural Engineers Inc. Toronto, ON	519 979 3858
ECO-Technica, Edmonton, AB	780-440-0400
ENGCOMP, Saskatoon, SK	306-978-7730
Engineering Link Inc., Toronto, ON	416-599-5465
Entuitive, Toronto, ON	416-477-5832
Entuitive Corporation, Calgary, AB	403-879-1270
exp, Markham, ON	905-695-3217
exp, Hamilton, ON	905-525-6069
Experts-Conseils CEP inc., Laval, QC	418-622-4480
Fluor Canada Ltd., Calgary, AB	403-537-4000
GCM Consultants , Anjou, QC	514-351-8350
Genifab Consultants Inc., Quebec, QC	418-622-1676
Gerrits Engineering, Barrie, ON	705-737-3303
Glotman Simpson Consulting Engineers Vancouver, BC	604-734-8822
Golder Associates Ltd., Mississauga, ON	905-567-4444
Groupe-conseil Structura international Montréal, QC	514-360-3660
Haddad, Morgan and Associates Ltd. Windsor, ON	519-973-1177
Halsall Associates, Toronto, ON	416-487-5256
Harbourside Engineering Consultants Darmouth, NS	902-405-4696
Hastings & Aziz Limited, Consulting Engineers London, ON	519-439-0161
Hatch, Mississauga, ON	902-421-1065
Hatch, Saskatoon, SK	306-657-7500
Herold Engineering Limited Nanaimo, BC	250-751-8558
IBI Group, Etobicoke, ON	416-679-1930
IRC McCavour Engineering Group Inc. Mississauga, ON	905-607-7244
Isherwood Associates, Mississauga, ON	905-820-3480
Jacobs Canada Inc. , Edmonton, AB	780-732-7837
JADE Engineers Inc., Tillsonburg, ON	519-842-9500
JML Engineering, Thunder Bay, ON	807-345-1131
K. D. Ketchen & Associates Ltd. Surrey, BC	604-560-5540
Klohn Crippen Berger Ltd. Vancouver, BC	604-251-8429

Konsolidated Structural, Toronto, ON	416-762-3224
Kova Engineering (Saskatchewan) Ltd. Saskatoon, SK	306-652-9229
Krahn Engineering Ltd., Abbotsford, BC	604-853-8831
Leekor Engineering Inc., Ottawa, ON	613-234-0886
Les Conseillers BCA Consultants Inc. Montreal, QC	514-341-0118
Les Services exp inc. Drummondville, QC	819-478-8191
McElhanney Consulting Services Ltd. Vancouver, BC	604-683-8521
Morrison Hershfield Ltd. North York, ON	416-499-3110
MPa GROUPE CONSEIL INC. Carignan, QC	450-447-4537
N.A. Engineering Associates Inc. Stratford, ON	519-273-3205
Norda Stelo Inc., Quebec, QC	418-654-9600
Parsons Inc., Ottawa, ON	905-943-0500
Pharaoh Engineering Ltd. Medicine Hat, AB	403-526-6761
Pier Structural Engineering Corp. Waterloo, ON	519-885-3806
Pow Technologies, Div. of PPA Engineering Technologies Inc. Ingersoll, ON	519-425-5000
POYRY (Montreal) Inc., Montreal, QC	514-341-3221
Protostatix Engineering Consultants Edmonton, AB	780-423-5855
Qualimet Inc., Edmonton, AB	780-469-5870
R.J. Burnside & Associates Limited Collingwood, ON	705-446-0515
Read Jones Christoffersen Ltd. Calgary, AB	403-283-5073
Read Jones Christoffersen Ltd. Toronto, ON	416-977-5335
Read Jones Christoffersen Ltd. Vancouver, BC	604-738-0048
Read Jones Christoffersen Ltd. Victoria, BC	250-386-7794
Read Jones Christoffersen Ltd. Edmonton, AB	780-452-2325
Rempel Engineering & Management Ltd. Saskatoon, SK	306-343-8737
Robb Kullman Engineering Ltd. Saskatoon, SK	306-477-0655
Roy Consultants, Bathurst, NB	506-546-4484
Safe Roads Engineering, Gormley, ON	905-727-4198
Schorn Consultants Ltd., Waterloo, ON	519-884-4840
SDK et Associés, Montréal, QC	514-938-5995
Siefken Engineering Ltd. New Westminster, BC	604-525-4122
SKC Engineering Ltd., Surrey, BC	604-882-1889
SNC Lavalin, Toronto, ON	514-393-8000
SNC Lavalin Inc. Montréal, QC	514-393-1000
Stantec Consulting Ltd. Mississauga, ON	905-858-4424

Steenhof Building Services Group Orillia, ON	705-325-5400
Stephenson Engineering Ltd. Toronto, ON	416-635-9970
Teletek Structures Inc., St. Jacobs, ON	519-206-2060
The Walter Fedy Partnership Kitchener, ON	519-576-2150
UMA Engineering Ltd. Mississauga, ON	514-940-6862
Valron Structural Engineers - Steel Detailers Moncton, NB	506-856-9601
Weiler Smith Bowers, Burnaby, BC	604-294-3753
Wolfrom Engineering Ltd., Winnipeg, MB	204-452-0041
Wood Group PSN, St. John's, NL	709-778-4000
WSP Canada Inc. Brampton, ON	905-799-8220
WSP Canada Inc. Markham, ON	905-475-7270
WSP Canada Inc. Montréal, QC	514-340-0046
WSP Canada Inc. Mont-Tremblant, QC	819-425-3483
WSP Canada Inc., Ottawa, ON	613-829 2800
WSP Canada Inc. Sherwood Park , AB	780-410-6814
WSP Canada Inc., Victoria, BC	250-384-5510
Yolles, A CH2M HILL Company Toronto, ON	416-363-8123

PROFESSIONAL - INDIVIDUAL

Vitomir, M Acimovic, Montréal, QC	514-940-9511
Mehrdad Ahmadi, Langley, BC	604-888-1968
William J. Alcock, North Vancouver, BC	604-986-0663
Dean Anderson, St. Albert, AB	780-803-9926
Christian Audet, Sherbrooke, QC	819-434-1832
Dwain A. Babiak, Calgary, AB	403-255-6060
Doug Bach, Truro, NS	902-843-4180
Ray T. Bailey, St. John's, NL	709-579-4255
Stephen Barbour, St. John's, NL	709-753-2260
Michel Baril, Sherbrooke, QC	819-821-2395
Dominique Bauer, Montréal, QC	514-396-9844
Max Bischof, North Vancouver, BC	604-985-6744
Andrew Boettcher, Vancouver, BC	604-568-9373
Gordon J. Boneschansker Fredericton, NB	506-452-1441
Eric Boucher, Québec, QC	418-871-8103
Gordon D. Bowman, Gloucester, ON	613-742-7130
Jozef Budziak, Toronto, ON	416-740-5671
Julie Bui, London, ON	519-657-4703
Iain J. Cameron, Victoria, BC	250-999-9350
George Casoli, Richmond, BC	604-273-7737
Edward H. Chapman, Brantford, ON	226-387-3610
James Chapman, Edmonton, AB	780-438-9000
François Charest, Repentigny, QC	450-581-8070
M.P. (Michel) Comeau, Halifax, NS	902-429-5454
Marc-André Comeau Salaberry-de-Valleyfield, QC	450-371-8585
Frédéric Côté, Sherbrooke, QC	819-565-3385
Louis Crépeau, Montréal, QC	514-931-1080
Jean-Pierre Dandois, Magog, QC	514-592-1164
Dominic D'Aquila, St-Laurent, QC	514-747-0550
Gordon Debbert, London, ON	519-668-2022
Ameen DeRaj, Winnipeg, MB	204-800-2072
Harold Dibben, Trenton, ON	613-392-9287
Jean-Marc Dugre, Sherbrooke, QC	819-791-8805
Daniel Dumont, Gatineau, QC	819-360-5229
Arno Dyck, Calgary, AB	403-255-6040
Afshin AE Ebtekar, Thornhill, ON	905-597-7723
Elie El-Chakieh, Laval, QC	514 892 2717
Paul B. Elliott, Calgary, AB	403-271-6466
Timothy Emmons, Inverary, ON	613-353-6865
Daniel A. Estabrooks, Saint John, NB	506-674-1810
Chris Evans, Udora, ON	705-228-8412
Cameron R. Franchuk, Edmonton, AB	780-429-1580
Timothy P. Fraser, Bellingham, WA	360-937-0448
Alex Fulop, Vaughan, ON	905-760-7663
Robert Gale, North Vancouver, BC	604-986-1222
Michael Gallo, Woodbridge, ON	416-830-1910
Daniel Gauthier, Lanoraie, QC	450-887-2095
Bernard Gérin-Lajoie, Outremont, QC	514-279-4821
Ricardo Giannuzzi, LaSalle, QC	514-789-7400
Jean-Paul Giffard Saint-Jean-Chrysostome, QC	418-839-7937
James M. Giffin, Amherst, NS	902-667-3300
Eric Gilbert, Sherbrooke, QC	819-563-8960
Robert Girard, Chicoutimi, QC	418-549-9687
Ali Asghar Gorji, Anjou, QC	514-271-9635
John Green, Amherst, NS	902-667-3300
Donald Gregory, Hamilton, ON	905-218-5482
MovsesR.Gulesserian, North York, ON	416-391-1230
Susan Guravich, Fredericton, NB	506-452-1804
John Stuart Hall, Ottawa, ON	613-789-0261
Joel Hampson, Vancouver, BC	778-386-2232
Matthew Hartog, Toronto, ON	416-368-1700
Roland A. Hase, Scarborough, ON	416-291-3723
Ralph W. Hildenbrandt, Calgary, AB	403-245-5501
Gary L. Hodgson, Niagara Falls, ON	905-357-6406
David Howard, Burlington, ON	905-632-9040
Roman Hudon, Winnipeg, ON	204-255-7251
Alfredo M. Ilacad, Portland, OR	503-954-3230
Don R. Ireland, Brampton, ON	905-846-9514
Yousif Jarjees, Mississauga, ON	416-662-5300
Brian Johnson, Kanata, ON	613-591-1533

Jacob Kachuba, Mississauga, ON	416-254-2829
Ely E. Kazakoff, Kelowna, BC	250-763-2306
Bhupender S. Khoral, Ottawa, ON	613-739-7482
Ian M. Kier, Grande Prairie, AB	780-532-6035
Franz Knoll, Montréal, QC	514-878-3021
Antoni Kowalczeuski, Edmonton, AB	780-451-9214
Keshava Arun Kumar, Calgary, AB	403-766-6402
Mankit Kwun, Richmond, BC	604-277-2254
Zoltan Lakatos, Burlington, ON	905-331-8307
Pierre Lanoue, Pointe-Claire, QC	450-973-5405
R. Mark Lasby, Calgary, AB	403-537-5162
Tony Latiza, Winnipeg, MB	204-221-2149
Barry F. Laviolette, Edmonton, AB	905-901-8535
René Laviolette, Lévis, QC	418-834-6172
Nazmi Lawen, Charlottetown, PE	902-368-2300
Graham Lawrence, Saint John, NB	506-634-8259
Hugo G. Le Bihan, Kelowna, BC	250-448-4830
Marc LeBlanc, Dieppe, NB	506-382-5550
Paul-Maurice LeBlanc Drummondville, QC	819-395-2752
Steve Lécuyer, Brossard, QC	514-333-5151
Jeff Leibgott, St.- Laurent, QC	514-933-6621
Claude Lelièvre, Québec, QC	418-861-8737
Salvatore Leo, Kirkland, QC	514-334-1234
Thomas Leung, Ottawa, ON	613-258-2544
William C.K. Leung, Woodbridge, ON	905-851-9535
Haijun Li, Markham, ON	905-479-9525
Chet Liu, Chatam, ON	514-351-9612
Clint S. Low, Vancouver, BC	604-688-9861
Ian Malcolm, Kemptville, ON	613-860-0923
James R. Malo, Thunder Bay, ON	807-345-5582
Frédéric Marquis, Montréal, QC	514-282-8100
Brian Mashford, North Bay, ON	705-494-8255
Alfredo Mastrodicasa, Woodbridge, ON	905-856-2530
Mohamed Matar, Winnipeg, MB	204-477-2512
Rein A. Matiisen, Calgary, AB	403-338-5804
Jean Stéphane Mbega North Vancouver, BC	604-986-0663
Brian McClure, Nanaimo, BC	250-713-9875
Mark McFadden, Chatham, ON	514-351-9612
Glenn J. McMillan, London, ON	519-453-1480
Neil McMillan, Bowmanville, ON	905 697 9698
Shane A. McShane, Peterborough, ON	705-749-0003
Arvid Meland, Calgary, AB	403-716-8158
Konstantinos Mermigas St. Catharines, ON	905-704-2345
Andrew W. Metten, Vancouver, BC	604-688-9861
Jason Mewis, Saskatoon, SK	306-978-7730
Yannick Michaud, Pohénégamook, QC	418-859-2927
Mark Milner, Richmond Hill , ON	905-737-6881
Bahram Mirpourian, Thornhill, ON	416-676-1441
Namvar Moazzami, Calgary, AB	403-400-5345
Mark K. Moland, Lepreau, NB	506-659-6388
David T Molloy, Burlington, ON	905-332-1404
G. Abbas Nanji, Richmond Hill, ON	416-757-3611
Rémi Octeau, Saguenay, QC	418-545-1150
Yannick Pageau, Québec, QC	418-914-9299
Neil A. Paolini, Etobicoke, ON	416-249-4651
Louis Paradis, Lac-Beauport, QC	418-572-8829
Françis Paré, Trois-Rivières, QC	819-373-1145
Serge Parent, Sherbrooke, QC	819-640-0310
Sinisa Pavlovic, Richmond, BC	604-270-8048
Erick Pepin, St-Georges, QC	418-228-2223
Michael Picco, Concord, ON	905-760-9688
Gérard Pilon, Valleyfield, QC	450-373-9999
Alain Pomerleau St-Jean-Sur-Richelieu, QC	450-357-0955
David Prud[1]Homme, Dorval, QC	514-833-4715
R. Paul Ransom, Burlington, ON	905-639-9628
Dan S. Rapinda, Winnipeg, MB	204-488-6674
Hamidreza Razaghi, Edmonton, AB	780-577-5662
Mehrak Razzvi, North Vancouver, BC	604-988-7131
Robert Rea, Tecumseh, ON	519-962-9637
Joël Rhéaume, Beauport, QC	418-660-5858
Aaron Rideout, St. John's, NL	709-726-3468
Danny Rosanova, Thornhill, ON	905-882-1100
John Rosenquist, Lake Zurick, IL	847-540-9286
James Rudy, Beaconsfield, QC	514-426-1638
Hossam Saleh, Toronto, ON	647-932-2460
Chris Sargent, Grand Falls - Windsor, NL	709-489-9150
Joseph M. Sarkor, Kelowna, BC	250-868-1413
Ken Savage, Vancouver, BC	604-637-2275
Ron Schmidt, Saskatoon, SK	306-668-0293
Jaydip Shah, Saskatoon, SK	306-934-2442
Michael D Simpson, Burlington, ON	905-331-7156
John A. Singleton, St. John's, NL	709-739-5500
Stig Skarborn, Fredericton, NB	506-452-1804
Paul Slater, Kitchener, ON	519-743-6500
Lauchlin Smith, Edmonton, AB	780-409-3146
Rory A. Smith, Calgary, AB	403-806-1558
Terrence D. Smith, Toronto, ON	416-798-8770
Eric Sobel, Lakewood, CO	303-431-6100
Ralph E. Southward, Hamilton, ON	905-639-7455
Steven Stelzer, Cote-Saint- Luc, QC	514-482-4984
Helene Theriault, Moncton, NB	506-875-0941
Bram Toomath, Vaughan, ON	905-580-4400
Darren B. Towells, Winnipeg, MB	204-227-1151
Mike L. Trader, Hamilton, ON	905-381-3231
Serge Y. Tremblay St-Augustin de Desmaures, QC	418-878-3218
Normand Trudel, Pierrefonds, QC	514-971-5484
Daniel E. Turner, Montréal, QC	514-344-1865
David Vadocz, Langley, BC	604-533-7382
Deborah VanSlyke, Fredericton, NB	506-452-8480
Vassily Verganelakis, Montreal, QC	514-342-3430
J.H.R. Vierhuis, Willowdale, ON	416-497-8600
Romano Viglione, Calgary, AB	403-804-0696
Roger Vino, Surrey, BC	604-576-7369
Dave R.M. Vrkljan, Calgary, AB	403-251-2578
Brian Waddell, Cambridge, ON	519-267-6789
Michel Walsh, LaSalle, QC	514-364-0406
Ian Washbrook, Calgary, AB	403-800-4486
Andrew Watson, Kamloops, BC	250-374-2244
M. Declan Whelan, Hamilton, ON	905-523-1988
Kevin Wong, Markham, ON	905-305-6133
Daniela Xavier, Toronto, ON	647-774-3531
Chell K. Yee, Edmonton, AB	780-488-5636
Jonathan Young, St. Catharines, ON	905-684-1111
Yuan Xiaoli, Waterloo, ON	226-978-1297
Jinsheng Zhao, Calgary, AB	403-244-5029
Paul Zinn, Delta, BC	604-940-4050

TECHNICAL - INDIVIDUAL

Frank Bastone, Woodbridge, ON	905-856-2189
Miguel Clement, St.Pascal, ON	613-297-9983
Paul Good, Vancouver, BC	604-255-0992
Scott Gullacher, Regina, SK	306-565-0411
Martin Kowalyk, Moose Jaw, SK	306-692-9594
Denis Mallet, Lutes Mountain, NB	506-855-3201
Patrick S. McManus, Cheyenne, WY	307-637-8422
Luciano Patricelli, Markham, ON	905-604-5522
Angelo M. Ricciuto, Concord, ON	905-669-6303
Ronald W. Rollins, Burnaby, BC	604-453-4057
Asif Sultan, Mississauga, ON	905-848-4047
Meynardo Vendiola, Edmonton, AB	780-444-7116
Stuart Veysey, Fredericton, NB	506-452-7000
Kenneth Williams, Edmonton, AB	780-488-6969

INDEX TO ADVERTISERS

ADVANTAGE STEEL

NO 55 SUMMER 2016

Publisher
Michael Bell
michaelb@mediaedge.ca

Editor
Matthew Bradford
matthewb@mediaedge.ca

Sales Executives
Les Bridgeman, Derek de Weerdt, Kari Philippot, Walter Niekamp, David Tetlock, Dawn Stokes

Senior Graphic Designer
Annette Carlucci

Published by:
MediaEdge

MediaEdge Publishing Inc.
33 South Station Street
North York, ON M9N 2B2
Toll-Free: 1-866-480-4717 ext. 229
531 Marion Street
Winnipeg, MB Canada R2J 0J9
Toll Free: 1-866-201-3096
Fax: 204-480-4420
www.mediaedgepublishing.com

President
Kevin Brown
kevinb@mediaedge.ca

Senior Vice-President:
Robert Thompson
robertt@mediaedge.ca

Branch Manager
Nancie Privé
nanciep@mediaedgepublishing.com

PLEASE RETURN UNDELIVERABLE COPIES TO: CISC-ICCA
3760, 14th Avenue, Suite 200
Markham, ON Canada L3R 3T7
Telephone: 905-604-3231
Fax: 905-604-3239

PUBLICATION MAIL AGREEMENT #40787580
ISSN 1192-5248

480 University Avenue – Toronto

The existing 18-storey office tower at 480 University Avenue will be expanded to 55 stories, creating a large, new mixed-use tower in one of the densest areas in Toronto.

To help remove the curtainwall, Walters developed a custom jig apparatus specifically designed to remove sections of the wall face.

Walters Group offers end-to-end solutions on complex steelwork projects across North America.

WALTERS GROUP

www.waltersgroupinc.com