ADVANTAGE STEEL

NO. 58 SUMMER 2017

BRIDGE ISSUE

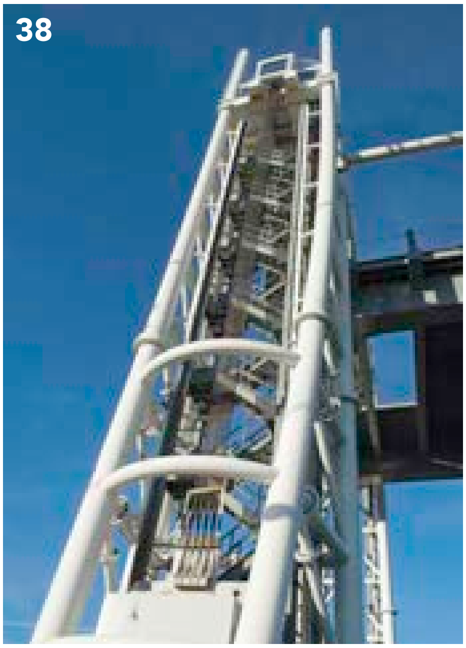
+ BRIDGING THE REMOTE NORTH
A GATEWAY TO RENEWAL
FLYOVER BRIDGES
AN ESSENTIAL LINK

cisc icca
CANADIAN INSTITUTE OF STEEL CONSTRUCTION

PM#40787580

ADVANTAGE STEEL

NO 58 SUMMER 2017



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: Award winning and innovative steel bridges across Canada

"FISC" My new favourite acronym

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

/cisc_icca

IN JANUARY, I WROTE about the CISC led trade case launched in September 2016 against dumped and subsidized industrial structural steel and platework aka FISC originating from China, South Korea and Spain. The case is now over, the dust settled and the findings and reasons published.

The acronym "FISC" stands for fabricated industrial steel components. A key and important word is "industrial". We focused our case only on industrial and within specific industrial sectors. In the context of our trade case, FISC includes: steel beams, columns, braces, frames, railings, stairs, trusses, conveyor belt frame structures and galleries, bents, bins, chutes, hoppers, ductwork, process tanks, pipe racks and apron feeders, whether assembled or partially assembled into modules, or unassembled, for use in industrial structures for:

1. Buildings
2. Process equipment, process enclosures
3. Access structures and process structures
4. Structures for conveyancing and material handling

in the following sectors:

- Oil and gas extraction, conveyance and processing
- Mining extraction, conveyance, storage, and processing
- Industrial power generation facilities
- Petrochemical plants
- Cement plants
- Fertilizer plants
- Industrial metal smelters

As you will notice it includes fabrication of stick steel, full & partial assemblies and frames right up to the modern module of all sizes and complexity. There are a few more details to what's listed above and I encourage you to visit our website for full details.

Opposition to our case came surprisingly from within Canada and focused primarily on modules, arguing that modules are not structures but are a manufactured product. Tell that to the building official!

What was interesting and eye opening was the focus by opponents on BC. This is a heads up to where the next battleground lies. They asked the Tribunal to exclude modules in BC stating that due to projects being along the coast, the modules could be made extremely large and complex (full of equipment and other trades' products (plug and play), and due to lower cost in countries such as China, would be procured outside of Canada no matter what. So, for those in other non-FISC industrial construction sectors, if you are hoping future LNG construction projects (if they ever get the provincial nod) will help the BC economy and your company, think again. If no action is taken by your industry now you are most likely not to get any work at all from these projects if they have their way.

Modularization is fast becoming the construction method of choice for industrial construction around the world putting construction assembly in modular yards rather than at the project site where labour, safety and productivity are sometimes a factor. Modularization can also be used to take advantage of illegal artificially low prices from dumping and subsidizing countries. The ultimate module is the largest that one can make and transport. It includes everything including FISC, piping, electrical, mechanical equipment, instrumentation, siding, roofing, etc. For coastal projects, it not uncommon now to have complex modules in the 1000-8000+ tonnes range. Make these modules in a country that is known for its dumping and subsidizing practices and there is no country or industrial construction sector in the world that will be able to compete. Countries will lose not only their steel industries but also all the other construction trades and industries feeding into these projects.

So, what was the outcome of our trade case?

1. Canada Border Services Agency (CBSA) proved that China, South Korea and Spain were illegally dumping into Canada. China was also found to be illegally subsidizing their industry. There were some companies that had lower dumping margins but in general the range of dumping was in the 42% to 46%. In the case of China, they were also assessed with an average subsidizing margin of 70%.

cisc | icca

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.

Connect with us: **Tel: (905) 604-3231 • cisc-icca.ca • twitter.com/cisc_icca.**

COME SEE THE STRUMIS FEATURES THAT OTHER PROVIDERS ARE ONLY TALKING ABOUT.
OTHERS PROMISE; WE DELIVER.

THE FUTURE OF STEEL FABRICATION.

Stay connected to STRUMIS:

STRUMIS

BRINGING STRUCTURE TO STEEL

SALES@STRUMIS.COM | 610-280-9840 | WWW.STRUMIS.COM

SOFTWARE BY STRUMIS LLC. PART OF THE GLOBAL RDS GROUP

2. The Canadian International Trade Tribunal (CITT) found in favour of our claim of harm, implementing a tariff on the subject countries effective January 2017 for 5 years.
3. The CITT ruled against requests for exclusions of modules of FISC and non-FISC components (think mechanical, electrical, piping etc.) leaving the decision of what is applicable to CBSA on a case-by-case basis.
4. The actual tariffs applied will be calculated on a project-by-project basis using normalized values by CBSA. The importer is the party required to pay the tariff.
5. The tariff applied is payable to the Government of Canada.
6. The steel construction industry does not receive any of the tariff funds collected by the government.

What did we prove? We proved our assertion that the subject countries were indeed illegally dumping into our country. We proved illegal dumping and subsidizing and not global competitiveness were the reasons for the dramatic difference in pricing. We proved that the Canadian steel construction industry will stand up and fight for trade fairness for our industry, for our employees, their families and for Canada. This ruling allows Canadian companies and their supply chains to benefit in Canadian projects, and compete on a level and fair playing field. That is all they want. They are not looking for protection but demanding fairness. Canadian companies must abide by the rules and therefore foreign companies playing in our markets must be held to the same standard.

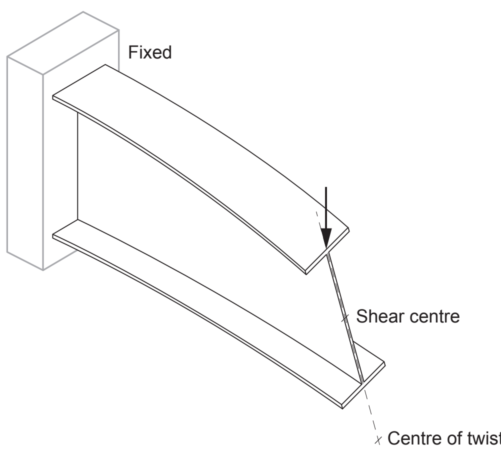
The CISC has paved the way for other Canadian industries of complex products to protect themselves against dumping and subsidizing. It is a tough and hard road with many uncertainties but if faced with a similar situation, as we did with FISC, you have no choice. AS

CISC provides this column as a part of its commitment to the education of those interested in the use of steel in construction. Neither CISC nor the author assumes responsibility for errors or oversights resulting from the use of the information contained herein. Suggested solutions may not necessarily apply to a particular structure or application, and are not intended to replace the expertise of a professional engineer, architect or other licensed professional.

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

Question 1: **In the design of a cantilever wide-flange beam with a fully fixed end and subjected to a point load at the tip, what is the most effective braced point against lateral-torsional buckling? I can provide a lateral support near the tip, either to the compression flange or the tension flange.**

Answer: Contrary to common misconception, lateral support to the tension flange at the cantilever tip is more effective. In other words, a tension-flange braced cantilever has a larger lateral-torsional buckling resistance. As shown in the Figure, the twist centre of the buckled shape is on the compression side of the neutral axis.



Question 2: **I have another question: Does the load application point in relation to the shear centre affect the buckling resistance?**

Answer: Yes, unless the cantilever tip is fully braced against rotation, e.g. both flanges are laterally supported. When only one flange is laterally supported, a load applied on the tension side of the shear centre creates a destabilizing effect, resulting in a smaller buckling resistance.

Question 3: **After decades of professional practice, I recently heard that limit states design of steel beams and joists that require sprayed fire protection should include 'load restriction factors'. Should I?**

Answer: UL Directories provide comprehensive cUL fire-rated designs that are applicable in Canada and are free from load restriction. These cUL Designs for floor assemblies, beams and open-web steel joists, together with several non-load-restricted ULC Designs, capture all common applications in building construction. Part 1 of the recently launched *CISC Steel Design Series* "ULC and cUL Sprayed-Applied Fire-Rated Designs" includes a summary of these non-load-restricted Designs.

Question 4: **Are 8-millimetre-thick hardened washers required for pretensioned large A490 bolts used in oversized and slotted holes?**

Answer: In the recently issued Update to CSA S16-14, Clause 23.4.2 d) specifies 8-millimetre-thick ASTM F436 hardened washers for pretensioned A490 bolts greater than 26 mm used in oversized and slotted holes, except that F436 washers in combination with a 10-mm plate washer covering the holes may be used.

Question 5: **The CISC Handbook tabulates C_w-values for open sections but excludes them for HSS. Why?**

Answer: HSS are closed sections and possess much larger St. Venant torsional stiffness as compared to their warping counterpart. C_w may be conservatively ignored for practical purposes. AS

ERRATUM. In *Advantage Steel* #44, this column referenced the expressions for the elastic lateral-torsional buckling moment of cantilevers provided in the *Guide to Stability Design Criteria for Metal Structures, 6th Edition*. In comparison with recent studies using finite element analyses, the expression "Mc = 1.5GJ/d" gives unconservative values for plates (rectangular section) and long cantilevers of I-sections prone to lateral-torsional buckling. It should not be used for plate cantilevers significantly longer than twice their depth.

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


STRONGER THAN STEEL
TWO IN ONE DRILLING AND SAWING
DRILL + MITER SAW ALL PROFILES IN ONE MACHINE
HIGH SPEED CARBIDE DRILLING, COPE MILLING, TAPPING AND COUNTERSINKING
5 kW MITER SAWING +/- 30°
WATCH VIDEOS HERE
www.peddinghaus.com/ca/xdm
PEDDI XDM-630
DRILL SAW COMBO
Peddinghaus
For Western Canadian Sales Contact: Akhurst Machinery (780) 718-2287
For Eastern Canadian Sales Contact: AS Bond 003 (819) 260-3007
www.peddinghaus.com | info@peddinghaus.com | +1 (815) 937-3800

Evolution in Seismic Design of Steel Buildings

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

MAINSTREAM SEISMIC design requirements for building structures have evolved since the introduction of the National Building Code. In its first edition, NBC 1941 (see Figure 1), buildings in locations where destructive earthquakes were probable were required to resist a static horizontal force acting in any possible direction at its centre of gravity. The static force was given as a function of the building weight and a constant C, where the value of C depended on whether the allowable bearing value of the soil was greater than one ton per square foot. Yes, that was it!

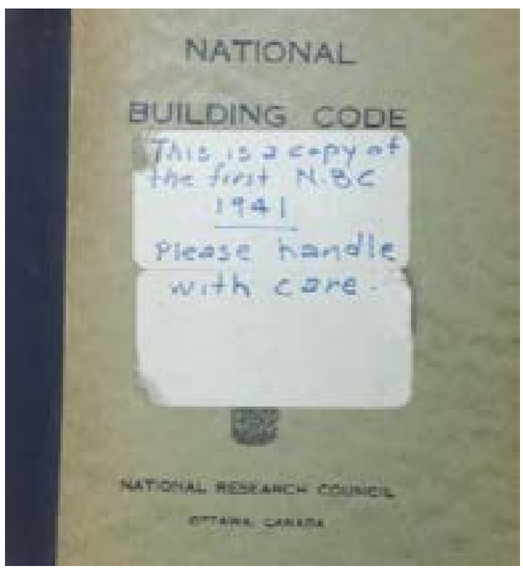


FIGURE 1:

Development of seismic maps and zones, recognition and incorporation of dynamic properties including natural period(s) and damping and other influential parameters such as accidental torsion, followed. In NBCC 1965, seismic force-resisting systems (SFRS) were divided into two groups in recognition of the differences in performance and ductile behaviour (or lack thereof). Accordingly, building types that featured moment-resisting frames and ductile shear walls were assigned a force multiplier, K = 0.7, whereas other types of building were assigned K = 1.25. Importance factors were also introduced. Subsequently, building types and their associated K-factors were expanded. In NBCC 1975, there were five building types, having K-values from 0.7 for moment frame buildings to 2.0 for unreinforced masonry buildings. Generally, these K-values were established based on observation of past performance and ranking in relation to each other.

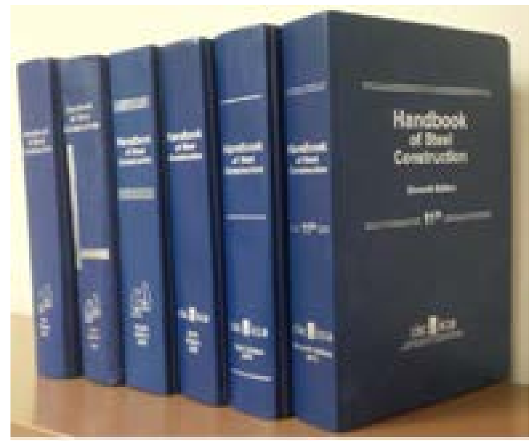


FIGURE 2:

The revolution in seismic design of steel framed buildings began with the introduction of NBC 1990 and CSA Standard S16.1-M89. Developments up to the current S16-14 edition, contained in the 5th through the 11th edition of the CISC Handbook of Steel Construction (see Figure 2), are summarized below.

CSA S16.1-M89

In a very comprehensive new clause, Clause 27, S16.1-M89 introduced specific design and detailing requirements for most steel SFRS referenced in NBC 1990. Force modification factors R, which replaced the K-factors, applied as divisors. For a system that qualified for an R > 1.5, the design was required to meet a specific set of requirements in Clause 27 of S16.1-M89.

Clause 27 covered ductile design requirements for five SFRS:

- Ductile moment-resisting frames
- Moment-resisting frames with nominal ductility
- Ductile braced frames
- Braced frames with nominal ductility, and
- Eccentrically braced frames

Since the 1989 edition of S16.1, connections in ductile or nominally ductile braced frames have been required to resist the gross-section tensile yielding capacity of the diagonal brace member, $A_g F_y$. An historical overview of this requirement can be found in Advantage Steel No. 23.

CSA S16.1-94

Seismic requirements in Clause 27 were somewhat relaxed for structures in low seismic zones. Seismic design of steel-plate shear wall was introduced.

CSA S16-01

Moderately-ductile moment-resisting frames were added to the list of SFRS in S16-01. Ductile concentrically braced frames were replaced with moderately-ductile concentrically braced frames. Although implicit in previous editions of S16, Conventional Construction (R = 1.5) was formally added to Clause 27 along with specific requirements.

The design of moment connections in ductile and moderately-ductile moment-resisting frames must be based on physical testing of full scale connections.

In S16-01 Supplement No. 1 (issued in 2005), echoed a change incorporated in NBC 2005, replacing the force modification factor, R, with the product $R_d R_o$, where R_d and R_o are ductility-related and overstrength-related force modification factors, respectively.

CSA S16-09

The evolution of seismic design continued in 2009 with the addition of new SFRS such as limited-ductility plate walls and ductile buckling-restrained brace frames. Height limits for Conventional Construction in moderate and high seismicities were extended, provided a variety of conditions were satisfied, and the concept of "protected zone" was introduced.

CSA S16-14

Material requirements for SFRS were expanded in 2014 with the introduction of "demand-critical welds", which are discussed in Advantage Steel No. 56. Built-up and modular link beams offered new advantages for buildings incorporating eccentrically braced frames.

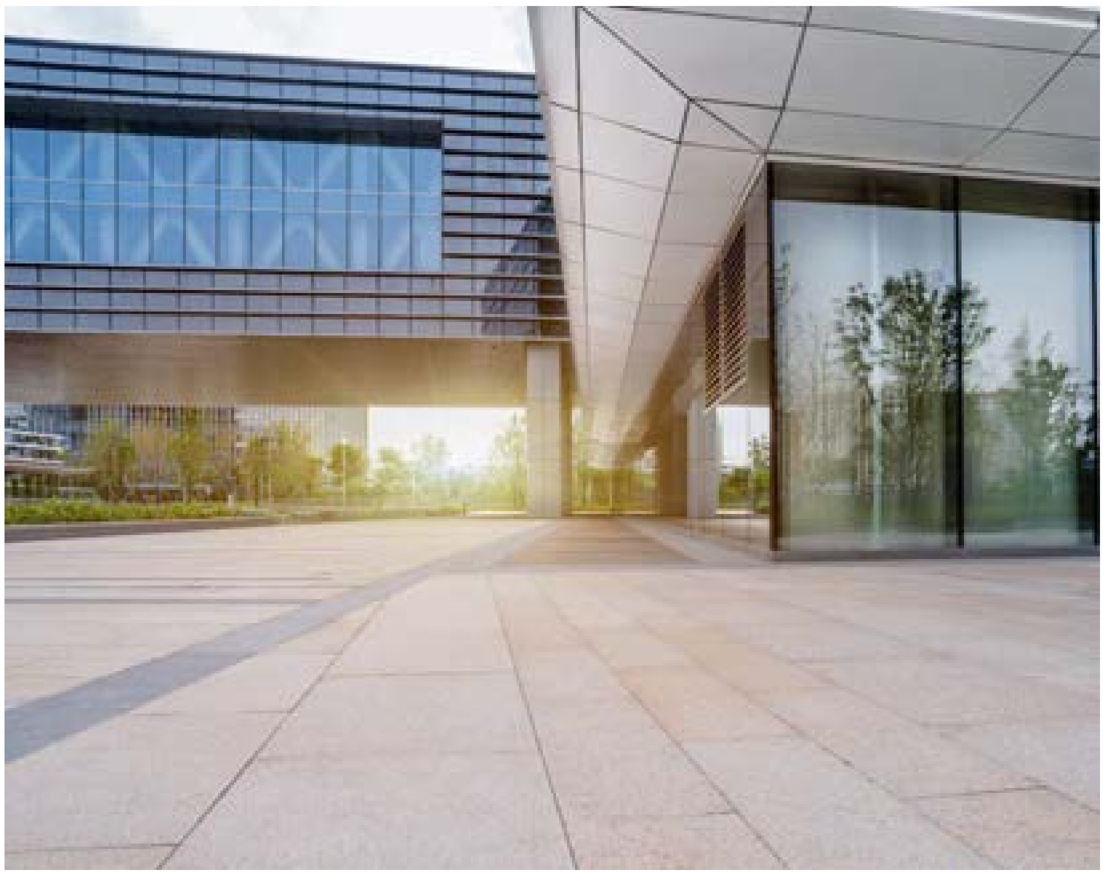
Many changes have been incorporated in the NBC during the last two decades. Some of them have also affected the seismic design of steel-framed buildings. AS

Tareq Ali, RPM
Director of Marketing and Communications

The Zero Carbon Building Standard

A bold effort to accelerate the transition to zero carbon building construction

The Canadian building industry now has a robust new tool to help them construct highly energy-efficient, zero carbon buildings in the future with the launch of the Canada Green Building Council (CaGBC)'s ground breaking Zero Carbon Building Standard.



THIS UNIQUE, CANADIAN CRAFTED Standard assesses carbon use in commercial, institutional, and multi-family buildings in Canada, providing a path for both new and existing buildings to reach zero carbon. A zero carbon building is defined as one that is highly energy-efficient and produces onsite, or procures, carbon-free renewable energy in an amount sufficient to offset the annual carbon emissions associated with its operations.

The Standard's focus on carbon is crucial, as the most important factor in the carbon footprint of a building is often not energy performance, but the carbon intensity of the local electrical grid and the fossil fuels used. Recognizing these differences is therefore critical to accurately assessing impacts and guiding investments in energy efficiency, heating technologies, and renewable energy.

The Zero Carbon Building Standard is part of a larger CaGBC Zero Carbon Building Initiative that was created to champion the move to lower-carbon commercial, institutional and high-rise residential buildings in support of Canada's efforts to reduce greenhouse gas emissions by 30 per cent by 2030.

It was developed by CaGBC and Integral Group, in extensive consultation with representatives from over 50 industry organizations, utilities, governments and companies across Canada.

Key components of the Zero Carbon Building Standard include:

1. **Zero Carbon Balance:** No net greenhouse gas (GHG) emissions are associated with building operations. GHG emissions are offset by generating clean, renewable energy onsite or offsite.

2. **Efficiency:** New construction projects consider peak energy while maximizing energy efficiency with a focus on the building envelope and ventilation strategies that drive down thermal energy demand.

3. **Renewable Energy:** Onsite renewable energy is incorporated into new construction projects to provide added resiliency, minimize offsite environmental impacts, and prepare buildings for a distributed energy future.

4. **Low-Carbon Materials:** An assessment of the carbon associated with structural and envelope materials—from manufacturing to end of life—informs design decisions.

Key Requirements of the Zero Carbon Building Standard include:

1. **Demonstration of Annual Zero Carbon Balance**
   Central to the program requirements, GHG emissions associated with building operations must be offset with low-carbon renewable energy, either generated onsite or procured through a contractual arrangement.

2. **Providing a Zero Carbon Transition Plan**
   All applicants who rely on onsite combustion of fuels other than zero emissions biofuels must provide a transition plan to demonstrate how the building will decarbonize in the future, showing that they have considered appropriate building design or retrofit measures.

3. **Installing a Minimum of Five Per cent Onsite Renewable Energy**
   ZCB-Design certification requires that at least five per cent of the building's total energy consumption be met using renewable energy that is generated onsite. This requirement does not apply to ZCB-Performance certification.

4. **Achieving a Thermal Energy Demand Intensity Target**
   Thermal energy demand intensity (TEDI) refers to the annual heat loss from a building's envelope and ventilation, after accounting for all passive heat gains and losses. Specific TEDI targets for ZCB-Design certification have been set, which results in greater resilience and occupant comfort, while ensuring that building designers focus on minimizing a building's demand for energy prior to producing or procuring renewable energy.

5. **Reporting of Energy Use Intensity**
   The ZCB Standard requires applicants to report their Energy Use Intensity (EUI) to provide transparency and enable the industry to learn from each zero carbon building. Reporting EUI also enables the operators of a building to gauge the effectiveness of energy conservation measures and demonstrate progress over time.

6. **Reporting of Annual Peak Demand**
   As with EUI, the rationale for this component of the program is to encourage projects to track and reduce their peak demand over time, to help reduce stress on the electrical grid and avoid the need for additional generation capacity.

7. **Reporting of Embodied Carbon**
   Applicants for Zero Carbon Building certification will be required to report the embodied emissions of their building's structural and envelope materials using life-cycle assessment (LCA) software.

Source: The Canada Green Building Council (CaGBC)

The CaGBC's new Zero Carbon Building Standard represents a bold vision to develop frameworks and tools that will help to dramatically reduce Canada's carbon emissions, and meet its global climate change reduction goals. AS

FEATURE

BRIDGING THE REMOTE

Fort Nelson River Bridge gets a vital makeover

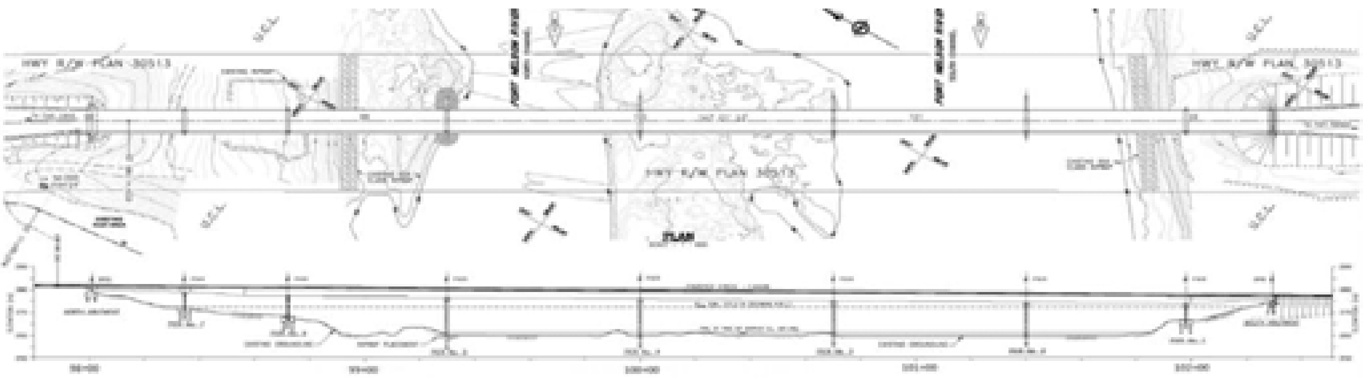
Raj Singh, P.Eng., PE; C.P. (Ken) Rebel, P.Eng.; Chad Amiel, P.Eng.

NORTH

THE LIARD HIGHWAY NO. 77 is a primary route to the Western Northwest Territories and Fort Liard, Nahanni Park, and Fort Simpson. As such, it provides vital access for goods transportation, health and safety, tourism, and emergency access. Along this highway, the Fort Nelson River Bridge traverses the river it's named after, approximately 68km northwest of Fort Nelson and approximately 43km north of the Alaska Highway junction. Due to funding constraints in 1984, the owner constructed only a single lane temporary ACROW superstructure with a timber deck supported on permanent piers that were engineered with capacity to accommodate a future two-lane highway superstructure.

Over time, the single-lane crossing was increasingly causing delays for passenger vehicles and truck traffic travelling to and from the Liard natural gas basin (one of BC's largest reserves), as vehicles needed to wait for traffic to clear in one direction before making their way across the 430m bridge. Therefore, in 2012, the owner, BC Ministry of Transportation and Infrastructure decided to upgrade the bridge by replacing the existing superstructure to increase traffic volumes and to eliminate delays. The replacement project was procured through a conventional design-bid-build scheme, and McElhanney Consulting Services Ltd. was engaged for the conceptual and detailed design of the bridge on behalf of the owner. The bridge consists of 8 continuous spans of 34.4m – 37.3m – 59.9m – 70.1m – 70.1m – 70.1m – 57.9m – 32.1m, supported on 7 piers and 2 concrete abutments resting on driven steel pile piles.

The team faced several challenges that needed to be addressed in the design of the replacement. Firstly, the substructures and foundations needed to be evaluated based on the current bridge code and strengthened to meet the demands of the new two-lane modern superstructure. Secondly, the climate and remoteness of the site made the durability and longevity of the bridge components important considerations, as maintenance demands have a higher than typical influence



on the lifecycle costs. Solutions requiring less maintenance and more robustness are favourable. Thirdly, engineering the new bridge so that it could be built within the northern region's short construction season was a major challenge to address. Therefore, solutions that allowed construction to continue through the winter or are more flexible vis-à-vis weather conditions were considered more favourable. Finally keeping traffic flowing during construction to minimize disruption to the industrial and public commuters was an important stakeholder requirement.

The team used a multi-account evaluation approach to compare several superstructure replacement options for cost and constructability, as well as suitability for northern conditions, durability, and risk. Thus, steel girders were found to be a more cost-effective solution, considering the bridge span arrangement and site location, transportation, handling, erection, and cost. The 40m sections of steel girders were much easier to handle and transport to site than any other girder solution. Given the relatively long multi-span bridge and limited in-stream access conditions, incremental launching was preferred over conventional crane erection from a work bridge or ice bridge. In contrast, heavier concrete girders would be difficult to handle and transport in full 70m segments, while shorter segments would require costly post-tensioning operations to splice together. Additionally, erection would require stick-build construction either from the frozen river or a work bridge, ruling out the possibility of girder erection through incremental launching. Steel plate girders with constant depth (or steadily changing depth to accommodate existing pier elevations) were found to provide the best weight and cost efficiency for the site.

"The team used a multi account evaluation approach to compare a number of superstructure replacement options for cost and constructability, as well as suitability for northern conditions, durability, and risk"

The evaluation also considered options for the number of girder lines, to determine an optimal arrangement. While the team considered a four-girder option due to its shallower depth, this would have required approximately 25% more steel and thus was ruled out. The optimal arrangement for structural steel efficiency, and redundancy against collapse, was a three-girder line option. The resulting girder spacing provided comfortable room for inspections and maintenance, a high priority aspect for bridges in northern remote locations. For the bridge deck, partial depth precast and full depth precast options were assessed; the latter was chosen because fabrication in a certified plant environment would ensure high quality and minimize concrete cover (thus reducing weight,) and the panels could be produced and installed year round. A composite steel girder superstructure with three girder lines and a full depth precast deck was recommended to the Ministry for advancement to the detailed design stage.

To address the project challenges, McElhanney needed to reassess the use of existing substructures constructed in 1984 to accommodate two lanes of traffic. Based on the review of existing pile capacity information, the team determined that both abutments and the land piers 1, 6, and 7 and the river piers 2, 3, 4, and 5 all required additional piling and pile cap modifications to carry the increased superstructure loads and make them compliant with current code standards. To make the new superstructure compatible with the existing substructure geometry, the three steel plate girders have a constant depth of 3m over most of the bridge with the end spans transitioning down to 1.1m to match up with the top of existing abutment seats and top of the pier 7 pier cap.

To enhance durability and reduce maintenance needs, the bridge superstructure, including the deck, was made continuous over the entire length of the bridge, with expansion joints at the abutments only. Deck continuity shields the girder system from the weather elements and improves the durability performance of the bridge, while enhancing user comfort. Minimizing of joints further reduces the maintenance effort and thereby the lifecycle cost of the bridge. Continuity over a length of 430m was achieved through a novel articulation scheme developed to minimize longitudinal pier deflection under braking loads, minimize restraining forces arising from expansion and contraction during temperature changes, and simplify bearing replacement. The existing piers are extremely flexible in the longitudinal direction, so four middle piers were required instead of only two piers to resist external longitudinal loads. Due to their flexibility in the longitudinal direction, the thermal movements imposed on the fixed piers are easily accommodated with minimal stress in the piles.

Given the relatively long multi-span bridge and limited in-stream access conditions due to the northern conditions, the team designed and detailed the girders for an incremental launch method of erection. In this construction method, the girders and diaphragms are assembled in a launching bed at one end of the bridge and progressively pushed over the piers to the opposite bank. Several unique details were incorporated into the design to simplify temporary equipment and allow the superstructure to be launched without overstressing the permanent components. Design details included a constant width bottom flange to simplify guide roller designs, a gap in the bottom flange splice plate to allow the rollers to pass through, a relatively stocky bottom flange that can accommodate the high compressive stresses during the launch, and a constant depth girder.

In consultations with the trucking association, the City of Fort Nelson, and local road user groups, it became evident that one lane of traffic during construction was highly desirable. Therefore, the replacement design incorporated traffic staging to minimize traffic disruptions. This scheme involved utilizing the ACROW superstructure as a temporary detour bridge adjacent to the existing highway. For this, the ACROW bridge was laterally slid along the piers onto temporary

A steel girder system was the preferred choice, scoring higher on all aspects of the selection criteria including cost, transportation, handling, constructability, erection through incremental launching, and the ability to be laterally slid with relative ease to allow traffic staging. The significantly lighter weight of steel was also advantageous in minimizing the payload on the existing piers that would have required greater strengthening in the case of a heavier superstructure.

falsework extensions along a temporary detour road that allowed traffic to pass throughout the construction phase.

The project was awarded for construction in 2015 after a competitive bidding process to Forbes Construction Ltd. that sub-contracted with Rapid Span for structural steel fabrication.

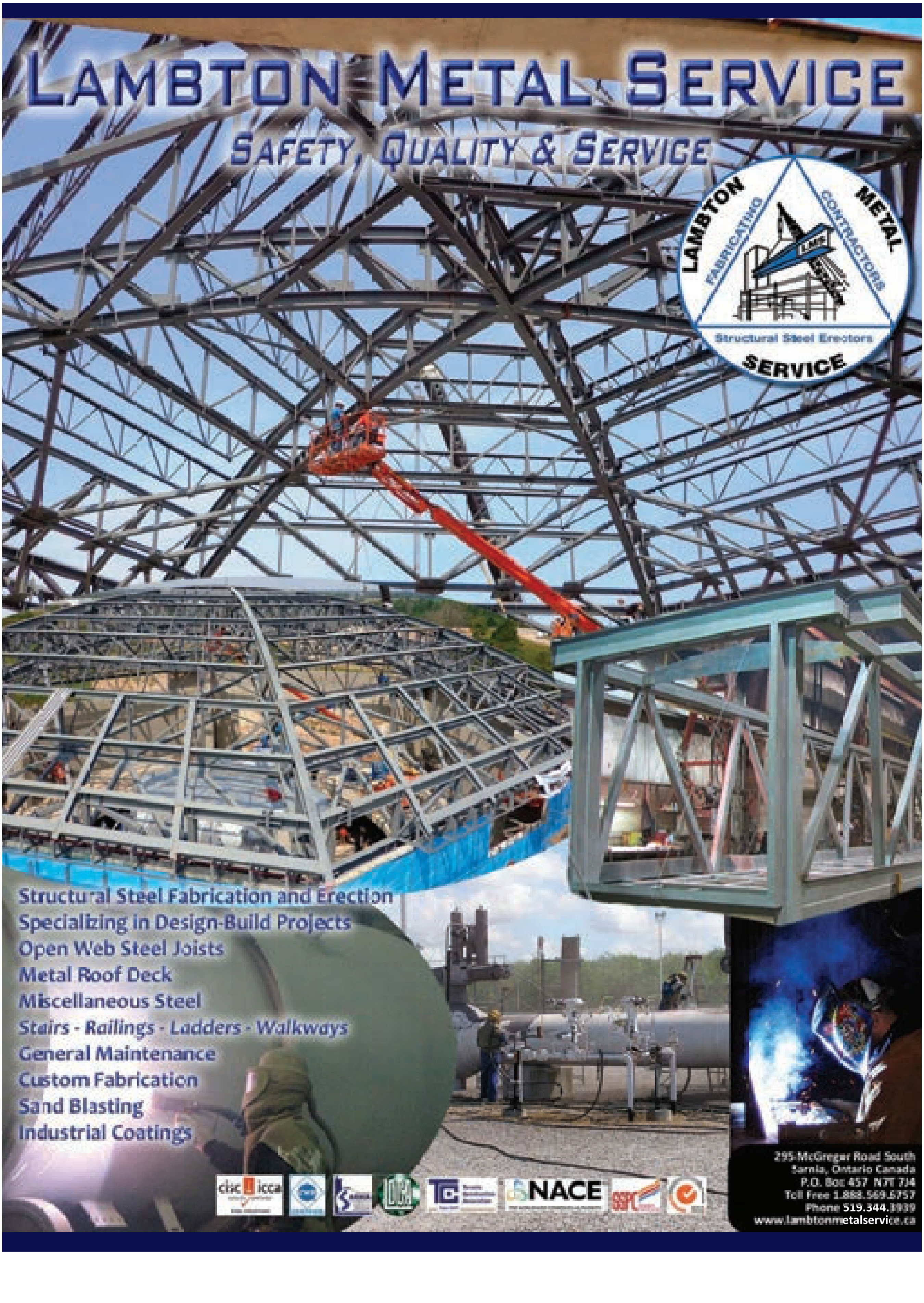
The design process considered the site extreme conditions in developing a cost-effective steel solution that incorporates an advantageous erection scheme for this remote, northern bridge. The design was thoughtfully configured to speed up on-site construction, still delivering a quality bridge with improved durability and reduced maintenance. The continuous superstructure is one of the longest jointless girder bridge in British Columbia. Most importantly, the existing superstructure was utilized not only for construction support during low traffic hours but also allowing the flow of industrial and public vehicles throughout construction. The construction of the Fort Nelson River Bridge superstructure is under progress and anticipated to be completed at the end of August 2017. Once completed, the new two-lane bridge will allow traffic to travel unimpeded along the Liard Highway No. 77 and greatly improve current traffic flow required to support the increasing industrial activity. AS

PROJECT TEAM

OWNER: BC MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE

CONSULTANT: MCELHANNEY CONSULTING SERVICES LTD.

CONTRACTOR: FORBES CONSTRUCTION LTD. **FABRICATOR:** RAPID SPAN



LAMBTON METAL SERVICE
SAFETY, QUALITY & SERVICE
LAMBTON METAL SERVICE
FABRICATING CONTRACTORS
Structural Steel Erectors
Structural Steel Fabrication and Erection
Specializing in Design-Build Projects
Open Web Steel Joists
Metal Roof Deck
Miscellaneous Steel
Stairs - Railings - Ladders - Walkways
General Maintenance
Custom Fabrication
Sand Blasting
Industrial Coatings
NACE
295 McGregor Road South
Sarnia, Ontario Canada
P.O. Box 457 N7T 7J4
Toll Free 1.888.569.6757
Phone 519.344.3939
www.lambtonmetalservice.ca

FEATURE

A GATEWAY TO RENE

The John Street Pedestrian Bridge joins two worlds

Aaron Bean, Project Manager, Walters Inc.

WAL

LOCATED IN TORONTO, Ontario, the John Street Pedestrian Bridge creates a new passageway over a busy rail line which in the past divided two Toronto neighbourhoods. As a gateway to a renewed part of the city, it had to be both functional and pleasing to the eye. The John Street bridge is now the new gateway to Toronto's revitalized Old Weston Village, and nicely complements the New Farmer's Market and Cultural Hub projects that surround the area.

Walter Group's role in this project was detailing, fabrication, and the preassembled delivery of the bridge to the project site. Fabrication took place at both Walter's Princeton, Ontario and Hamilton, Ontario plants. The seemingly simple design presented interesting challenges throughout the fabrication and detailing process.

The John Street Pedestrian Bridge consists of two 93-foot-long by 23-foot-high arched trusses constructed of 16 inch diameter round HSS (Hollow Structural Steel) top and bottom chords, and 7/8-inch diameter stainless steel cables for the webs. The bottom lacing of the bridge consists of 8-inch diameter HSS. These 8-inch diameter HSS floor cross beams descend from the truss bottom chord with a curved shape. To ensure optimization of this welded transition, Walters constructed mock pieces which were welded, then sectioned in half, to confirm acceptable weld penetration.

Walters welding engineers created test joints in which two tubes were welded together to create an elliptically shaped weld where the

"It took a collaborative effort by all team members to ensure that the final product matched the original design intent. The finished product is something that we can all be proud of."

Aaron Bean, Project Manager, Walters Inc.

branch member met the chord member. These joints were then welded and sectioned to ensure adequate weld throat.

There were many challenges in all facets of this project. The final appearance of the bridge trusses needed to be seamless, so each piece forming the arch of the truss needed to be carefully fit and welded in the shop with an AESS (Architecturally Exposed Structural Steel) finish. Compounding challenges even further was the 30-degree outward slope of each arch with no top chord cross support members. This created significant loads in the ends of the trusses which needed to be resolved.

"The John Street Bridge project was particularly challenging due to the design, shape, and logistics of shipping this large bridge to site and pre-assembling it prior to erection," shared Aaron Bean, Project Manager at Walters Inc. "It took a collaborative effort by all team members to ensure that the final product matched the original design intent. The finished product is something that we can all be proud of."

There was also an extensive exercise that Walters had to go through when considering the shipping of these trusses. Each side of the John Street Pedestrian Bridge was shipped fully assembled. This required oversized loads that limited when components could

leave Princeton, Ontario and enter Toronto. Numerous trips to the site to review the route and access points were conducted. During these visits, it was determined that the GO train signal arms needed to be temporarily taken down to allow trucks to make the tight turn into the site area. Detailed shipping plans were then generated and submitted to the City of Toronto for permits. Police escorts were also required to provide a seamless journey.

Moving all of these parts needed to coincide with the field teams' ability to erect the bridge off to the side of the bridge's final position; logistics and communication were key.

The assembly of the two main arches with cables and handrails was done entirely in-house, along with all 70 tons of steel which was galvanized, painted and shipped to the site in two large pieces.

Erection was completed by the end of June 2015, and installation took place entirely overnight by lifting the bridge by crane over the GO train tracks, which remained live and operational throughout the installation process, while lowering the arches into place.

Walters is pleased to have been a part of this project with our project engineering partners at Parsons, and to have had the opportunity of delivering excellence to our valued client KO Constructors and owner Metrolinx. AS

PROJECT TEAM

ENGINEER – PARSONS **GENERAL CONTRACTOR** – KO CONSTRUCTORS **OWNER** – METROLINX **CLIENT** – KO CONSTRUCTORS

FABRICATOR, ERECTOR – WALTERS GROUP INC.

FEATURE

FLYOVER BRIDGES

NE Anthony Henday Drive and Yellowhead Trail Interchange

Myles Eugene Henry Lewis, P.Eng., Structural Engineer

THE NORTHEAST SEGMENT of Anthony Henday Drive (NEAHD) opened on October 1, 2016 and brought to completion a $4 billion investment in Edmonton's Ring Road, the first in Alberta. The NEAHD consists of nine interchanges, 47 bridge structures and 27 kilometres of six to eight lanes of divided highway. The Edmonton Ring Road, the largest highway construction project undertaken in Alberta's history, forms an 80-kilometre free-flowing route around the City of Edmonton and connects 24 municipalities in the Capital Region.

The project included a three-level system interchange connecting NE Anthony Henday Drive to Yellowhead Trail. The combination of high traffic volumes, the free-flowing traffic design, a very small land footprint and tight project schedules under the P3 model made the design of this interchange highly complex. This interchange required the modification of five bridges and the construction of 17 new bridges, including two flyover ramps. This required a great deal of collaboration within the project team in bridge design, fabrication, transportation logistics and site erection.

The two bridge structures we are profiling are interchange flyover bridges 23.3 and 23.5. These bridges were constructed with straight plate I-girder segments arranged with a series of kinks forming continuous segmentally curved girder lines. Bearings on conventional abutments and intermediate substructures support the steel girders. Figure 1 shows the two flyover bridges within the systems interchange. Structure 23.3 is a 415m long six span (approx. 48-67-92-79-67-64m spans) with a radius of 347m. The bridge forms a S-E ramp connecting southbound Anthony Henday Drive to eastbound Yellowhead Trail with two traffic lanes on a 14.85m wide deck. Structure 23.5 is a 315m long five span (approx. 48-62-86-57-62m spans) with a radius of 340m. A 11.75m wide deck supports one traffic lane that connects northbound Anthony Henday Drive to westbound Yellowhead Trail forming a N-W ramp.

FIGURE 1: Anthony Henday Drive / Yellowhead Trail Interchange near completion

Courtesy of FDAL JV

Very early in the pursuit phase it became apparent that the pier layout for the curved flyover bridges would be a challenge.

DESIGN

Span Geometry:

Very early in the pursuit phase it became apparent that the pier layout for the curved flyover bridges would be a challenge. Perpendicular crossing

FIGURE 2: Bridge 23.5 Girder Fabrication

It was concluded that the curved bridges should be constructed with straight steel plate I-girders arranged with a series of kinks forming continuous segmentally curved girder lines.

arteries, provisions for future lanes on Anthony Henday Drive, 9 – 11m horizontal clear zones, and small medians greatly restricted the physical space available for pier placement. Thus, the site constraints dictated long interior span lengths. The versatility of steel girders permitted an economic design by utilizing continuous girders that varied in girder depth, with deeper girders at the longer span(s) and shallow girders at the shorter spans. Varying the girder depth optimized the girders as well as reduced the earthworks required at the bridge approaches.

Girder Geometry:

Before design work on the project commenced, the consultants, contractors, and steel fabricators met to review the fabrication approach for all bridges. It was concluded that the curved bridges should be constructed with straight steel plate I-girders arranged with a series of kinks forming continuous segmentally curved girder lines. Fabricating the girders in straight segments made for easier fabrication and transportation of girder segments. Using straight girder segments also had the benefit of reducing the number of primary tension member cross frames to only those cross frames located adjacent to the kink locations. The fabricator joint venture on this project (Rapid Span/Structal) worked collaboratively to determine the most efficient utilization of their fabrication facilities to complete this project. This involved complex logistics that included deliveries by train and truck requiring transloading from three plants.

Flange widths were limited to multiples of 300mm to ensure efficient material use, ripping multiple flanges from a single rolled plate. Flange thickness increments were generally limited to 5mm to standardize the plate used for all plate girders on the project. The resulting flange sizes varied from 600mm x 30mm to 900mm x 75mm over high demand regions near the piers.

The fabricators' capacity limited the maximum feasible web depth to 3.7m. Deeper webs would have required a longitudinal web splice that was cost prohibitive. For simplicity and ease of fabrication, girder depth variation was accommodated with linear transitions. The resulting web depth of bridge 23.3 varies from 2.22 to 3.52m, which permitted the camber to be cut from the limiting 3.7m plate. To reduce the number of transverse stiffeners required on bridge 23.3, the web thickness varies utilizing 20, 22, and 25 mm thick webs. The web depth variance on bridge 23.5 is less pronounced at 2.4 to 3.0m. With less incentive to vary the web thickness, bridge 23.5 utilized a constant 18mm thick web.

The total girder tonnage, including cross frames and lateral bracing, is approximately 1,900 & 1,200 metric tonnes for bridge 23.3 and 23.5 respectively.

Speaking to the choice of steel for these bridges, Paul King of Rapid Span and Albert Chiza of Structal stated, "It's no secret to those in the business that steel bridge girders offer many advantages in terms of versatility, constructability and economy. While only 15 of the 47 bridges on this project were steel, they constituted the longest and the most complex structures. Steel's versatility easily accommodated the many horizontally curved alignments and highly skewed crossings. This is why steel ended up being used in over half of the bridges, in terms of total length, for this challenging project."

Field Segment Geometry:

The kink locations were chosen to produce kinked field splices, as shown in figure 2, which eliminates competing efficiencies of placement in low demand regions. Detailing two kinks within each intermediate span and one kink at each end span produced a maximum field segment of 41m for both structures. The heaviest girder segment weighed over 62 metric tonnes. The average field segment length was 37 and 35m for bridges 23.3 and 23.5 respectively.

Cross frames:

One distinct advantage of having the flange noncollinearity concentrated at the kinks is the ability to locally strengthen the flanges for these effects. To increase flange capacity,


Courtesy of AECOM

FIGURE 3: Bridge 23.3 Girder Cross Frames

while simultaneously reducing the flange lateral bending demand, cross frames are located on both sides of each girder kink. This arrangement greatly reduced the flange unbraced length at the kink locations. Furthermore, the resultant lateral thrust from the misaligned flange forces has a decreased eccentricity to the supporting cross frames.

ARTICULATION:

Both structures are tangentially restrained at the centermost pier support with fixed pot bearings at the interior girders and radially guided pot bearings at the exterior girders. The remaining exterior girder bearings are free in both directions, eliminating radial thermal induced forces. Guided pot bearings at interior girders provide articulation, allowing translation parallel to the flanges.

CONSTRUCTION:

To minimize a lateral bending component from an out-of-plumb girder, cross frames were detailed to fit under total dead load conditions (TDLF). This was facilitated by straight girder segments that are torsionally flexible, allowing the girders to be readily twisted to achieve fit.

FIGURE 4: Bridge 23.3 Girder Erection (Pier 5 to Abutment 1)

FIGURE 5: Bridge 23.5 Girder Erection (Pier 1 to Pier 2)

FIGURE 6: Bridge 23.5 Girder Erection Completed (Pier 4 – Abutment 1)

FIGURE 7: Bridge 23.5 Completed

Girder segments were erected using crawler cranes and temporarily supported on steel bents during construction. Girder erection started at the centermost pier support with the first girder line segments supported by shimmed bearings and a temporary shoring tower. Temporary restrainers prevented bearing movement prior to grouting the shimmed bearings in place. Girder segments were placed individually, progressing radially. Cross frames were installed incrementally between girder lines as girder erection progressed. Once the four girder line segments were complete with cross frames and lateral bracing, girder erection progressed tangentially down chainage with placing the next four girder line segments. This erection pattern was repeated until completing girder erection to the down chainage end of the bridge. Afterwards, girder erection progressed similarly up chainage from the centermost pier to the other end of the bridge. Temporary shoring towers supported the girder segments as needed and were removed prior to precast deck panel installation. As seen in figure 6 the shoring towers under the longest span remained in place to completion of girder erection to control girder deflections. Temporary shoring towers under shorter spans were removed once all field splices, cross frames, and lateral bracing were completed within the span. Bridge 23.3 and 23.5 girder erection was completed over approximately 10 weeks and six weeks respectively.

CONCLUSION:

The two fly-over bridges at the Yellowhead Trail and NE Anthony Henday Drive interchange are eye-catching and elegant as they carry all manner of vehicles across their long curved spans. They are an excellent representation of the strengths of designing bridges in steel to meet complex project demands. Design challenges were overcome by working with the entire P3 team to develop innovative solutions to deal with space limitations, height constraints and project deadlines that kept the project on track and allowed the final section of the ring road to be opened to traffic ahead of schedule. The project team, the Province of Alberta and the steel construction industry can be very proud of these elegantly beautiful fly-over bridges. AS

PROJECT TEAM FOR BRIDGES 23.3 & 23.5:

OWNER: ALBERTA MINISTRY OF TRANSPORTATION **CONTRACTOR:** FLATIRON-DRAGADOS-AECON-LAFARGE (FDAL) JOINT VENTURE

PROJECT PRIME CONSULTANT: AECOM **DESIGN ENGINEER:** STANTEC CONSULTING LTD. **FABRICATOR:** RAPID-SPAN/STRUCTAL JOINT VENTURE

(CANAM-BRIDGES, FORMERLY KNOWN AS STRUCTAL-BRIDGES, FABRICATED 23.3; RAPID-SPAN STRUCTURES LTD. FABRICATED 23.5)

CISC Alberta would like to thank the following sponsors

380W SPONSORS

CANAM

EMPIRE IRON WORKS
The infinite possibilities of steel

NWL
NORTHERN WELDARC LTD.

SUPREME GROUP

Waiward

350AT SPONSORS

AKHURST
Peddinghaus

ESKIMO STEEL

NUCOR
VULCRAFT CANADA, INC.

WALTERS GROUP

WF
W.F. WELDING & OVERHEAD CRANES LTD.

PROMOTIONAL PARTNER

EIA EDMONTON INTERNATIONAL AIRPORT

RECEPTION SPONSOR

rjc
Engineers

CELEBRATING EXCELLENCE IN STEEL DESIGN

2017 ALBERTA STEEL DESIGN AWARDS OF EXCELLENCE

for their generous support of our event on May 4, 2017.

350W SPONSORS

Atlas Tube

Ironworkers Local 720

Park Derochie

PCL

Russel Metals

Vicwest Building Products

300W SPONSORS

Action Trucking (Division of Action Express & Hotshot)

All Fabrication Machinery J.V.

Collins Steel

Daam Galvanizing

Franks Sandblasting & Painting

Infasco

Ironworkers Local #805

MNP (Meyers Norris Penny)

North American Steel Erectors Inc.

Nucor

Nucor Grating

Quirion Métal/EZ Steel

RJC Engineers

Steel Plus Network

Supermétal

TSE Steel

WINE SPONSORS

Buffalo Inspection Services

CWB Group

Entuitive

First West Capital

Gerdau

AN ESSENTIAL LINK

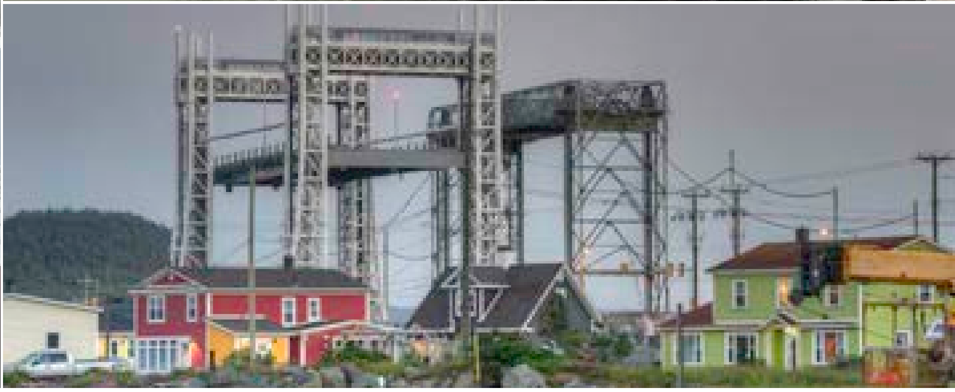
The design and construction of the Sir Ambrose Shea vertical lift

Hellen Christodoulou, Ph.D.ing., B.C.L., LL.B., M.B.A., CISC Quebec Region Manager

ON SEPTEMBER 23, 2016, the new Sir Ambrose Shea lift bridge in Newfoundland and Labrador, opened to traffic. Located on the Avalon Peninsula in the town of Placentia, approximately 100 km west by southwest of the capital city of St. John's, it was built as a replacement to an existing structure constructed in 1961 and was built directly adjacent to the existing bridge. In addition to being aesthetically pleasing with architecture reflecting the local culture and tourism potential of the region, the new bridge is designed to be durable, efficient and reliable. The new bridge was constructed adjacent to the existing bridge to minimize disruption to navigation and road traffic. Some of the important design considerations for this new bridge were durability, efficiency and reliability.

The approximate cost of $47.7 million included construction, engineering and demolition and removal of the old bridge. The three-span bridge superstructure measures 93 meters in length and includes 1,100 tons of structural steel, including 10 girders for the approaches, and four box girders and stringers for the lift span. The four-hollow structural tubular towers stand over 30.5 meters tall and measure 508mm wide by 25.4mm thick and they are comprised of a three-dimensional steel truss shaped representative of sails, and each tower component is

bridge



connected by a three-dimensional exoskeleton truss housing the machinery operating the lift span. Another welcoming feature was the 1.8m wide pedestrian sidewalk.

The bridge includes 9,200 meters of steel piling, 3,800 cubic meters of concrete and 150 tons of reinforcing steel. The three-span bridge includes a center movable span (vertical lift span) flanked by two simple fixed composite plate girder spans.

"The use of structural steel was instrumental in designing a reliable signature moveable bridge and facilitating its constructability in this harsh natural environment, as well as ensuring its long-term durability."

Sylvain Montminy, ing., P.Eng., Vice-Président et Directeur Transport et ouvrages d'art - Canada Est, Parsons

THE DESIGN TEAM

FABRICATOR: CANAM-BRIDGES, A DIVISION OF GROUPE CANAM, QUEBEC **ENGINEERS:** PARSONS **ARCHITECTS:** BARRY PADOLSKY ASSOCIATES **DETAILERS:** TENCA DETAILERS, QUEBEC **GOODCO Z-TECH:** STRUCTURAL BEARINGS AND EXPANSION JOINTS **CONTRACTORS:** BIRD HEAVY CIVIL & H.J. O'CONNELL CONSTRUCTION **OWNER:** NEWFOUNDLAND AND LABRADOR DEPARTMENT OF TRANSPORTATION AND WORKS

FIGURE 1: Sir Ambrose Shea Vertical Lift Bridge

Photo credit: Bird Heavy Civil

FIGURE 2: Both the new and existing lift bridges cross the Placentia Gut

As an important part of the regional highway Route 100, this bridge serves as an essential link between the amalgamated communities of Placentia, Jerseyside, Dunville, and Freshwater. It operates year-round, yet the frequency of vessel passage is seasonal and is based on fishing activities, and raised for commercial fishing boats approximately 2,400 times annually, allowing them to enter and leave the Placentia Gut.

Functional requirements for this bridge were important considerations to the architectural features and appearance of the bridge, in view of the bridge's high visibility in the historic community of Placentia, the town's heritage, culture, and local environment and the importance of tourism to the local economy.

DESIGN CONSIDERATIONS

The functional navigational and roadway requirements were key considerations for the new bridge design and alignment. The design of this bridge was in accordance to the requirements of the Canadian Highway Bridge Design Code CAN/CSA S6-06, and related criteria of Section 13, referring to movable bridges, as well as the consideration of loading including: ice, high wind loads, horizontal wind loads and ship collision forces.

The new vertical lift bridge is comprised of three spans; a center 33m lift span, flanked by two 32m approach spans, accommodating two vehicle lanes with a sidewalk on each side. Under the lift span, the clear width of the navigation channel is 25m, with a minimum vertical clearance above high water of 3.05m when lowered and 21.34m when raised. The power and communication utilities were relocated from the existing bridge.

To avoid affecting vehicular traffic and to improve alignment, the horizontal alignment of the new bridge is parallel to the existing with a 22m offset to the East.

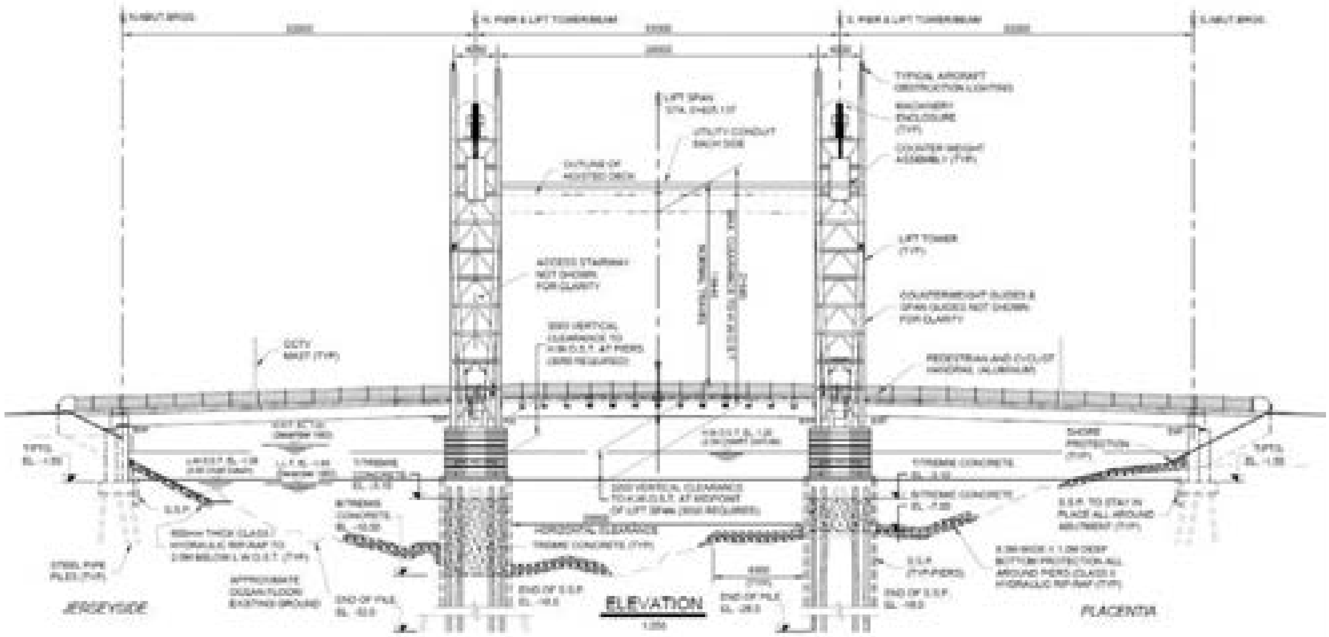


FIGURE 3: Bridge Elevation

Photo credit: Canam-Bridges

FIGURE 4: Bridge is a centre landmark project in the midst of the rich cultural landscape of the Placentia community

ARCHITECTURE REFLECTS CULTURAL LANDSCAPE

From the offset, the Newfoundland and Labrador Department of Transportation and Works had the vision to realize a landmark project in-the-midst of the rich cultural landscape. Apart from its high visibility, this new vertical bridge would be a tourist attraction, as well as an economic development hub. As architectural influence became a key focus of the design concept of this crossing, a means to embody the nautical imagery and complement the surrounding features, with an equally important emphasis on practicality, functionality and durability.

The unique architectural features were inspired by the Salford Quays Vertical Lift Bridge in Manchester, England and include the two vertical towers on each side of the lift span. Envisioned to represent boat masts and antennas, these aesthetically sleek elements emphasize verticality. Steel tubular members make up this bridge tower silhouette. The transparent machine rooms at the helm of the towers are captivating and attention drawing. To create a focal point of interest and visibility in a harmonious contract to the dark surrounding hills, sea and sky, the colour choice for the main elements of the bridge superstructure was white. A safe environment and inviting pedestrian experience with a wider sidewalk (1.8m) in comparison with a narrow 1.2m walkway on the existing bridge.

A VERTICAL LIFT BRIDGE WAS SELECTED

Several movable bridge options were considered. A vertical lift bridge was the most viable option, like the existing bridge, incorporating a machinery platform supported at height. Housing the most vulnerable elements higher than grade level and exposure to water, would guarantee better durability for the more vulnerable elements of the bridge.

The priorities in accessing the design considerations, had to seriously consider the reliability of the bridge's operations. For a swing span option, the location of the pier in the middle of the channel would reduce the effective navigable width. A bascule bridge alternative required a counterweight system, necessitating a higher clearance above water, higher approaches and mechanical components housed below the bridge deck.

The reliability of the bridge's operations was a high priority during design. The integration of the mechanical and electrical systems, the standby generators, the Programmable Logic Controller (PLC), used for system control and monitoring for remote monitoring and diagnostics were critical considerations for an effective and efficient operating system.

MANY WERE THE CHALLENGES

Many were the challenges during the construction. The Placentia Gut, a narrow section between the Atlantic Ocean and the river system has over three (3m) meter tidal range with swift currents. Wind conditions, rain and fog were key factors that dictated the direction and project scheduling.

The structural steel was fabricated by Canam-Bridges and shipped from Quebec for erection, so its transportation, though challenging, was exceptionally handled by Canam-Bridges. The

Photo credit: H.J. O'Connell Construction

FIGURES 5 & 6: Erection using a crane from a temporary work trestle

approximate 100-ton lift span, with some of the mechanical and electrical components of the permanent structure, was erected from a barge. The very complicated erection process required the shutting down of the marine channel.

Design had to consider transportation, erection, and long-term durability. This was achieved by designing the tower members with sealed and welded tubular pipe members. Flange bolted connections were designed to allow the contractor to fabricate the towers in manageable segments to be transported and handled on site without the need for field welding. This option allowed the contractor to fabricate each of the towers in 10 segments, assemble them on site, and erect them using a crane from a temporary work trestle (Figures 5 and 6).

Bolted connections minimized the erection duration of the towers significantly, to a few days in comparison to field welding which would have required substantially more time and a significant window of good weather, which is hard to achieve at this project site.

Durability:

The design team was committed to making the most effective design choices when selecting members, details, and systems to ensure the durability of the structure. The due diligence process included the observation of the existing bridge's performance history, given its constant exposure to very harsh environmental conditions. To ensure durability and optimal, constructability choices included:

- The use of sealed tubular structural sections;
- Opting for enclosures for mechanical machinery and components;
- Positioning of mechanical and electrical components in machine rooms 25m above the water level, to reduce the effect of salt spray and salty ocean water exposure;
- Using galvanized reinforcing rebars within the concrete elements;
- Minimizing expansion joints by using semi-integral abutment details at the approach spans;
- The selection of metallization for all structural steel components compounded with a top two-coat paint system as extended corrosion protection.

Utilities:

Existing power and communication lines on the old bridge were transferred to the new bridge using conduits hanging at the side of the approach spans, and up through the tower and into utility pipes specially designed between the towers.

Aesthetics were an integral part of the decision process relating to operational functionality. The design integrated the mechanical, electrical, and HVAC systems into the structure with minimal impact from a visual perspective while minimizing maintenance requirements and improving overall system efficiency.

BRIDGE SUPERSTRUCTURE

The Approach Spans

For the approach spans, the search was for the best option that would allow the contractor the flexibility to select the best construction procedures, bringing a better value to the owner. After careful consideration, a steel plate girder option with a cast-in-place deck, waterproofing and an asphalt wearing surface was selected. Using a crawler crane from the trestle, the pre-assembled approach span girders, with end and intermediate diaphragms, were erected. Steel provided the best option!

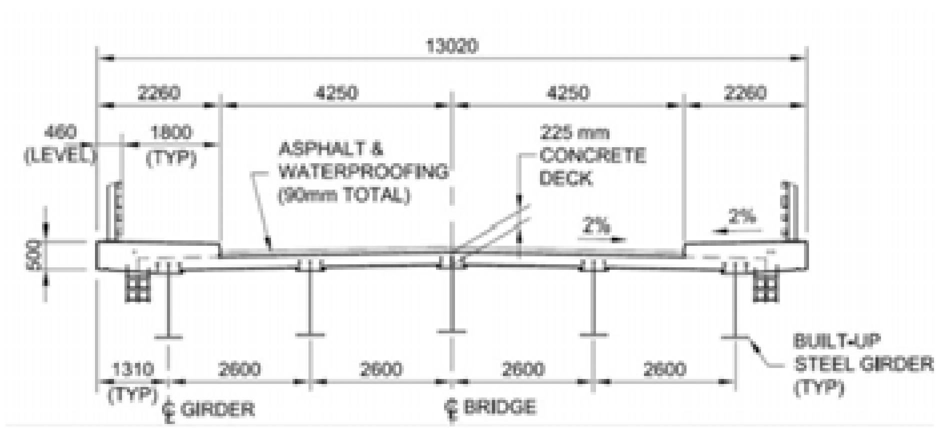


FIGURE 7: Steel plate girders approach span option

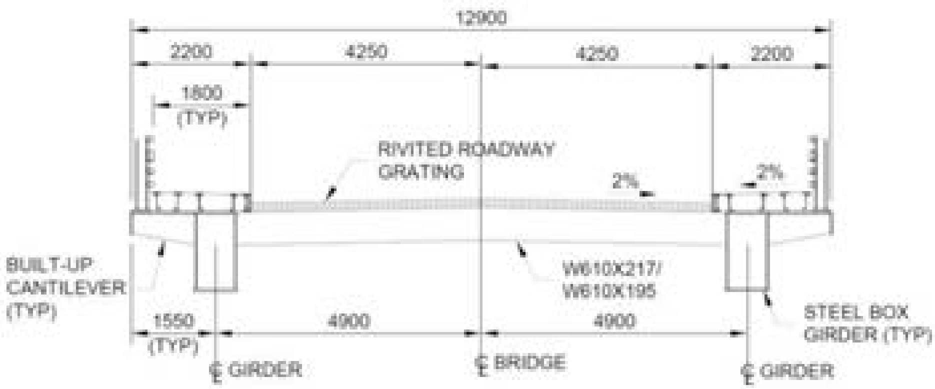
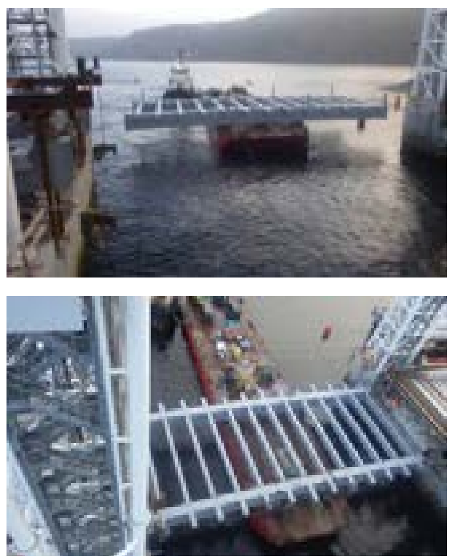


FIGURE 8: Lift span cross-section - open deck grating option

The Lift Span

An orthotropic steel deck was initially recommended for the lift span, however for this instance, the most viable solution of a riveted open deck grating system was selected by the owner.

The framing system shown below is comprised of two main longitudinal box girders with transverse floor beams in between supporting the deck. The lift beams are two box beams that support the longitudinal box girders at the ends of the lift span, which is designed to travel vertically 18.44m. They are used to lift the span during operation with the use of 32 - 38mm diameter wire ropes. The ropes which are connected to a total of four counterweights, each weighing about 50 tonnes, are within the tower and are supported on 3.0m sheaves, as a means to balance the lift span.



FIGURES 10 & 11: Moving lift span into position

FIGURE 9: Lift span framing system

The contractor assembled the lift span, which was designed with optional splices, on a barge from shore, in order to move it into position. The centre span was a major challenge because it involved shutting down the shipping lane for several days to allow the erection of a 100-ton span using strand jacks to lift it into position.

The tight construction tolerances for the movable components and the small deflection requirements for the structural members supporting the mechanical equipment, were an added challenge. All stages of design and construction required extensive multi-disciplinary coordination.

Due to its location in the open surrounded by hills, the bridge was subject to high winds, changing tides, and fast current. These were critical factors considered in the design, to ensure structure stability at all stages of construction, which were also big contributors to limited on-site crane operations. Additional challenges were met since the tide at the bridge site changed direction three times a day and the current reached up to 8 knots.

THREE-DIMENSIONAL TRUSS TOWERS

The towers consist of a three-dimensional truss, shaped to mimic nautical lines as shown in Figure 12. Components of each tower are connected by a three-dimensional exoskeleton truss which houses the enclosure for the machinery. The tower structural members are comprised of closed circular hollow structural sections (HSS) 508mm in diameter for the main tower legs and varying from 168 to 273mm in diameter for the diagonal members. The tower design had to accommodate the counterweights, the counterweight and span guides as well as the access stairs.

The counterweights for the lift span were housed inside the towers and are comprised of built-up steel boxes filled with steel plates. The machine rooms are accessible using stairs located within the towers. An aerial view of one of the towers showing the machine rooms is stunning and an attractive feature of this bridge.

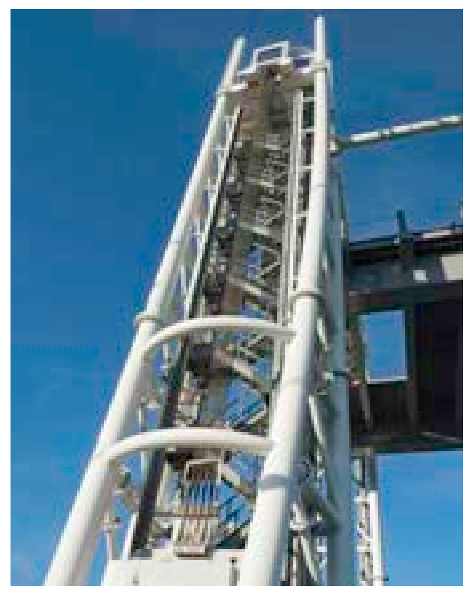


Photo credit: Canam-Bridges

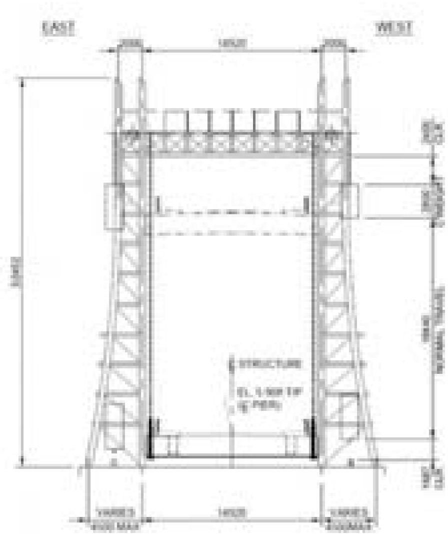


FIGURE 12: Steel tubular towers

Vulcraft delivers peace of mind.
Vulcraft's progressive technology, product innovation and comprehensive service and support all work together to bring our customers unrivaled success. We hang our hard hats on continuously providing the best customer experience possible and delivering better outcomes for all those involved.
As the largest manufacturer of joists and decking in North America, the Vulcraft team, which now includes Omega Joists, is dedicated to providing quality steel products that meet your project requirements and contract schedule.
We provide peace of mind by being better partners, offering better products and ensuring better outcomes. Every time.
Learn how Vulcraft delivers better outcomes.
www.vulcraft.ca
A72
NUCOR
VULCRAFT CANADA, INC.
Better Partners. Better Products. Better Outcomes.
Canada West
Nisku, Alberta
T: 780.955.3390
Canada East
Ancaster, Ontario
T: 289.443.2000

"We are proud to have built a complex structure like the Sir Ambrose Shea Bridge. We know that the fabrication of steel components for a structure requires an increased level of precision, particularly for a moving bridge, as manufacturing tolerances are even more important. Canam-Bridges successfully met the challenges of this type of project, particularly regarding the complexity of the irregular tower geometry made of welded joints."

Michel Turcot, Regional Sales Manager, Canam-Bridges

Photo credit: Canam-Bridges

FIGURE 13: Aerial tower view

FIGURE 14: Aerial tower view

Steel Design:

Design of the tower's tubular connections is not covered in traditional literature or codes, and required extensive finite element models to confirm the capacity of these connections. This was complicated by the fact that numerous loading conditions had to be considered for a movable bridge in both the open and closed position. Figure 15 shows a section of the structural model used to analyze the tower tubular connections. Furthermore, bending the tower legs and braces to the required radii is unconventional and required detailed specifications and testing to ensure the steel tubular member properties were not adversely affected by the bending process.

Photo credit: Canam-Bridges

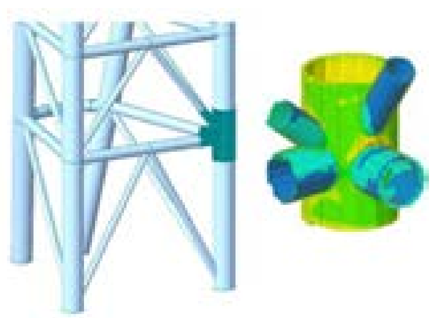


FIGURE 15: Tower finite element model

BRIDGE FOUNDATIONS

Subsurface conditions at the site were of silty and poorly graded sand, looser with depth. The piers are approximately 26.7m in length by 5.7m in width. The size is dictated by the towers and the lifting mechanism.

Design of the piers foundation had to rely on friction piles or a shallow foundation founded on a competent layer with limited bearing capacity. For economical reasons, the contractor elected to build the deep foundation option. The deep foundation option involved the installation of cofferdams; driving 136 – 324mm diameter close ended pipe piles approximately 30m into the ocean floor; excavating sub-aqueously, the overburden within the cofferdam, down to competent bearing material and pouring tremie concrete; constructing the pile cap on top of tremie concrete and constructing the remainder of the pier in the dry. Pipe piles were selected as they provide a higher

"The new Sir Ambrose Shea Bridge in Placentia, is a remodeled landmark that the townspeople of Placentia can take pride in for many years to come. After being involved in the construction of the Lift Bridge from the tendering phase to the last touch of paint, it has been a challenging project but one that as a team in partnership with the Department of Transportation have worked tirelessly to complete, while enduring some less than favorable conditions. My hat goes off to the execution team and the Placentia townspeople for tolerating all the challenges to deliver the new Sir Ambrose Shea Lift Bridge."

Darryl Gillingham, P. Eng. Vice President Industrial Development and Energy, Bird Heavy Civil Limited.

Photo credit: H.J. O'Connell Construction

FIGURE 16: Deep foundations using H-Piles

FIGURE 17: Pipe piles at pier foundation

skin friction and end bearing in comparison to H-piles. The deep foundations option is shown in Figures 16 and 17.

The shallow foundation option would have required installation of cofferdams and excavating sub-aqueously to competent bearing material, placing a tremie plug; and constructing the concrete foundations in the dry within the cofferdam. This would have required providing significant bracing for the cofferdams and excavating about 6.5m below the ocean floor for the north pier and 16m for the south pier.

The abutment foundations are supported on 30-324mm diameter friction pipe piles driven about 16.5m into the soils at the north abutment and 20m at the south abutment.

The abutment and pier piles are closed ended and filled with concrete for added stiffness. At the piers, several pipe piles had to be driven open ended to account for the stiffening of the soil within the cofferdam from the pile driving operations. Access for the piers construction was facilitated by the construction of a temporary work bridge from shore.

BRIDGE OPENS TO TRAFFIC

After 36 months of construction and at an approximate cost of $47.7 million, including construction, engineering, demolition and removal of the existing bridge, the new bridge was opened to traffic on September 23, 2016 (Figures 18 and 19).

The aesthetically pleasing bridge has become an iconic structure and an architectural landmark for the town of Placentia, an integral part of the local culture and an important part of the region's touristic hub, as a focal point in the community attracting visitors and new businesses to the area.

The use of steel enabled the designers to deliver a project that surpassed the imposed design requirements, providing the best sustainable option for optimal net positive effect on social, economic, and environmental aspects. AS

Photo credit: Canam-Bridges

FIGURE 18: Sir Ambrose Shea Vertical Bridge on opening day September 23, 2016

FIGURE 19: Sir Ambrose Shea Vertical Bridge on opening day September 23, 2016

Continuing Education Courses

WHAT'S NEW - CISC HANDBOOK 11TH EDITION AND CSA S16-14

This 6-hour course offered in nine modules covers changes in CSA S16-14 and the design of steel members and elements using the 11th Edition of the Handbook of Steel Construction. Registrants can take all 9 modules or just the CSA S16-14 changes.

STEEL BRIDGES - DESIGN, FABRICATION, CONSTRUCTION

This course covers the design, fabrication and construction of steel bridges based on CAN/CSA-S6-14, Canadian Highway Bridge Design Code. In addition to 4 reworked design examples, updated topics include code overview, brittle fracture, fatigue, methods of analysis, wind and seismic load effects, and aesthetics including pedestrian bridges.

INDUSTRIAL BUILDING DESIGN

This course focuses on practical and economical solutions for framing a typical industrial building to the requirements of CSA Standard S16-14. The course material will reference the new third edition of the Crane-Supporting Steel Structures: Design Guide and feature a completely reworked design example.

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.

SEISMIC DESIGN OF INDUSTRIAL STEEL STRUCTURES + CSA S16-14 ANNEX M

This webinar presents the seismic design requirements of the National Building Code of Canada 2015 and Clause 27 of CSA S16-14 as these requirements apply to industrial buildings. In addition, CSA 216-14 Annex M is introduced and applied to the design of pipe and process support structures.

SINGLE STOREY BUILDING DESIGN

This webinar focuses on practical and economical solutions for framing a single storey warehouse building with attached office area to the requirements of the 2010 National Building Code of Canada and the pertinent provisions of CSA Standard S16-09.

COMMON CODES AND STANDARDS FOR DESIGN AND CONSTRUCTION OF STEEL STRUCTURES

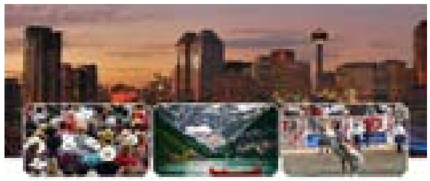
Current Status and Future Publication Targets

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.	Summer 2017
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	
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	
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	CSA W59-18	2018
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 S136-16	TBA	
CSA S136.1 Commentary on CSA S136	CSA S136.1-16	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*

REGISTER NOW FOR THE CISC CANADIAN STEEL CONFERENCE



The CISC's Canadian Steel Conference is the Canadian steel industry's one and only business development and executive networking event and the largest gathering of senior level leaders and decision makers in the industry.

The Canadian Steel Conference offers a comprehensive program that is packed with multiple business development, educational, networking and social events including multi-day, multi-track education sessions, and an expanded trade show exhibit showcasing the latest products & services in the steel industry.

Register now to get early bird pricing at www.canadiansteelconference.ca

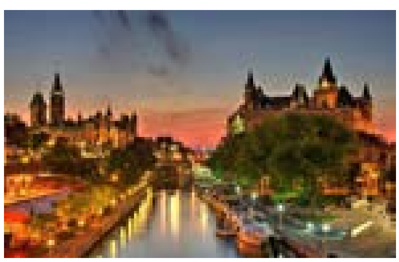
PROFILE YOUR BUSINESS AND GROW SALES! SPONSOR & EXHIBIT AT THE CISC CANADIAN STEEL CONFERENCE!

(Open to Members & Associates Only)

Our 2017 marketing & sponsorship program offers branding and profiling opportunities at various pre-event, on-site and post-event activities including opportunities to deliver introductory remarks at different events, exhibit in our tradeshow, and host a hospitality suite among others.

Visit canadiansteelconference.ca to download our sponsorship package or contact Tareq Ali, Director of Marketing & Communications at tali@cisc-icca.ca for more info.

CISC MEMBERS & ASSOCIATES HOLD ANNUAL "DAY ON THE HILL" IN OTTAWA ON APRIL 4



A national delegation of CISC Members & Associates were in Ottawa on April 4 to meet with Parliamentarians to urge action on key issues affecting our industry:

1. Support for Fair Payment – Vote Yes for *Prompt Payment Act* (Bill S-224).
2. Support for Fair Access for Canadian Companies to Canadian Infrastructure Construction Projects.
3. Support to Stop Unfair and Illegal Trade, Trade Circumvention and the hollowing out of the middle class.

CISC MANITOBA / NW ONTARIO HOST THEIR GLITTERING STEEL DESIGN AWARDS & GALA

CISC Manitoba / NW Ontario held their glittering Steel Design Awards & Gala on April 5th at the gorgeous New York Ballroom in the RBC Convention Centre in Winnipeg.

There were a total of 11 awards categories up for grabs at the Award of Merit and Regional Award levels. The award winners included the full team of companies involved in the project. Each Regional award-winning company received a one-of-a-kind CISC engraved trophy as a keepsake. Award of Merit winners received a commemorative certificate and a winning team picture as well.

The evening was attended by a full cross section from the steel construction industry. Regional fabricators, architectural and engineering consultants, steel and other suppliers, educators and students were treated to a multimedia presentation of all the projects and special projects in the region since 2000.

For more details, visit: http://cisc-icca.ca/awards/manitoba/2017

CISC WINS ANTI-DUMPING TRADE CASE ON FABRICATED INDUSTRIAL STEEL COMPONENTS

The CISC is pleased with the ruling by the Canadian International Trade Tribunal (CITT) confirming dumping of fabricated industrial steel components into Canada by the People's Republic of China (China), the Republic of Korea (Korea), and the Kingdom of Spain (Spain), and additional subsidizing of fabricated industrial steel components from China.

The CISC will continue to champion Canadian steel and vigorously defend our industry against unfair trade practices for the preservation of Canadian jobs and the success of the Canadian middle class.

Additional information about these investigations is contained in a Statement of Reasons, which is available on the CBSA's website at: http://www.cbsa-asfc.gc.ca/sima-lmsi/menu-eng.html.

BILL S-224, CANADA PROMPT PAYMENT ACT, PASSES THIRD READING IN THE SENATE

The CISC and the Canadian steel construction industry applaud the Canadian Senate for passing Bill S-224, marking a key milestone achievement in our efforts to ensure timely payment for our businesses and over 1.3 million Canadian construction workers and their middle class families.

Bill S-224 will now head to the House for further consideration.

CISC ALBERTA HOSTS DAZZLING STEEL DESIGN AWARDS ON MAY 4TH IN EDMONTON

CISC Alberta hosted the 11th Alberta Steel Design Awards of Excellence in Edmonton on May 4th at the Expo Centre in Edmonton Northlands. 365 guests attended the dazzling Awards Gala.

The finalist in each of the 6 award categories were profiled with individual video vignettes that introduced the audience to the project team, key design and construction details of the project.

Congratulations to all the high calibre Award Winners:

ENGINEERING:
Schulich School of Engineering, University of Calgary
Fabricator: Supermetal
Architect: Diamond Schmidt Architects & Gibbs Gage Architects
Engineer: RJC Engineers

ARCHITECTURE:
Studio Bell
Fabricator: Walters Group Inc
Architect: Kassian Architecture & Allied Works Architecture
Engineer: RJC Engineers

COLLABORATION:
Rogers Place
Fabricator: Canam Group In
Architect: HOK
Engineer: Thornton Tomasetti & DIALOG

SUSTAINABILITY:
St. Louis Hotel
Architect: Nyhoff Architecture
Engineer: Entuitive

BUILDING COMMUNITIES:
Emerald Hills Leisure Centre
Fabricator: Sturo Metal
Architect: Marshall Tittemore
Engineer: RJC Engineers

STEEL EDGE:
Studio Bell
Fabricator: Walters Group Inc
Architect: Kassian Architecture & Allied Works Architecture
Engineer: RJC Engineers

The awards planning committee also held a trophy design competition and selected the winner from four finalists. The trophies were custom fabricated by CISC member CW Carry Ltd. The winning design was based off of AVID Architecture Inc's design.

For more details, visit: https://cisc-icca.ca/awards/alberta-awards-2017/

CISC ONTARIO'S STEEL DESIGN AWARDS OF EXCELLENCE WAS A SHOW STOPPING SUCCESS!

CISC Ontario hosted their Steel Design Awards of Excellence at the Art Gallery of Ontario on May 9th. It was a lively evening that started with a networking reception and was capped off by a glittering gala awards ceremony celebrating the best in steel construction

The night started off with The History of Strength Award winners being honoured. Congratulations to: Anne Grimes, Mel Grimes, William "Bill" MacLeod, Terrence "Terry" Nemis, Jimmy Polifroni, Gord Rados and Peter Sheffield.

The show stoppers of the night were the following Award Winners:

PROJECTS CONVERTED OR INNOVATED USING STEEL AWARD OF MERIT:
St. Michael's Cathedral – Toronto, Ontario
CISC Erector: Niagara Rigging & Erecting
Engineer: Quinn Dressel Associates
Architect: VG Architect Ventin Group
Owner: Archdiocese of Toronto
General Contractor: Buttcon

PROJECTS CONVERTED OR INNOVATED USING STEEL AWARD OF EXCELLENCE
University of Toronto Faculty of Law Renovation and Expansion – Toronto, Ontario
CISC Fabricator: M&G Steel Ltd.
CISC Detailer: M&G Steel Ltd.
CISC Erector: McCormick Steel Inc.
Engineer: Read Jones Christoffersen Ltd.
Architect: B+H Architects
Owner: University of Toronto
General Contractor: Eastern Construction

THE ARCHITECTURAL AWARD OF EXCELLENCE
University of Toronto School of Architecture – Toronto, Ontario
CISC Fabricator: Norak Steel Construction Ltd.
CISC Erector: Stampa Steel Erectors Ltd.
Engineer: Entuitive
Architect: NADAA / ERA Architects
Owner: University of Toronto
General Contractor: Eastern Construction

Vaughan Civic Centre Resource Library – Vaughan, Ontario
CISC Fabricator: Gensteel
CISC Detailer: Gensteel
CISC Erector: Gensteel
Engineer: WSP Canada
Architect: ZAS Architects
Owner: Vaughan Public Library
General Contractor: Aquicon Construction
CISC Deck Contractor: CANAM Group

THE BRIDGE AWARD OF MERIT
Hwy 401 Widening and Rehabilitation – Cambridge, Ontario
CISC Fabricator: Central Welding & Iron Works
CISC Detailer: Central Welding & Iron Works
CISC Erector: Central Welding & Iron Works
Architect: Amex Foster Wheeler
Owner: Metrolinx
General Contractor: EllisDon

THE BRIDGE AWARD OF EXCELLENCE
Burgoyne Bridge – St. Catherines, Ontario
CISC Fabricator: Walters Group/ Canam Group
CISC Detailer: Walters Group
CISC Erector: Walters Group
Engineer: Parsons
Owner: Niagara Region
General Contractor: Pomerleau
CISC Deck Contractor: Vixman Construction Ltd.

THE ENGINEERING AWARD OF MERIT
BMO Field Expansion – Toronto, Ontario
CISC Fabricator: CANAM Group
CISC Detailer: CANAM Group
CISC Erector: CANAM Group
Engineer: Entuitive
Architect: Gensler
Owner: ICON Venue Group
General Contractor: PCL Constructors
CISC Deck Contractor: Vixman Construction Ltd.

THE ENGINEERING AWARD OF EXCELLENCE
480 University – Toronto, Ontario
CISC Fabricator: Walters Group
CISC Detailer: Walters Group
CISC Erector: Walters Group
Engineer: Sigmund Soudack
Architect: Core Architects
Owner: Amexon Development Corp
General Contractor: Toddglen
CISC Deck Contractor: Vixman Construction Ltd.

Congratulations to all our Award Winners, and nominees.
For more details, visit: https://cisc-icca.ca/awards/ontario-awards-2017/

CISC ALBERTA HOLDS TROPHY DESIGN COMPETITION FOR THE 2017 ALBERTA STEEL DESIGN AWARDS

CISC Alberta held a trophy design competition for this year's Alberta Steel Design Awards. This was an innovative way to further strengthen our connection to the architectural community, and engage them in the Design awards. Four very creative design submissions were received from different architectural firms.

The design criteria the competitors had to meet were that the trophy would have to be light to carry, small enough to handle and must use steel. The winning design went to AVID Architecture Inc. because their origami inspired trophy design showcased steel beautifully, and was distinct and elegant.

AVID Architecture Inc.'s winning design was then brought to life with fabrication by a CISC member and presented to all the winners of the CISC Alberta Steel Design Awards.

Congratulations to AVID Architecture Inc.

ECOLE DE TECHNOLOGIE SUPERIEURE (ETS) WINS AGAIN WITH OVERALL FIRST RANKING IN THE 2017 CSCE-CISC CANADIAN NATIONAL STEEL BRIDGE COMPETITION & ASCE-AISC'S 2017 NATIONAL STUDENT STEEL BRIDGE COMPETITION

The CISC was proud to be a host and judge at the Canadian National Steel Bridge Competition!

ETS also won 2nd place in the Efficiency category and 3rd place in the Construction Speed, Weight and economy categories in the ASCE-AISC National Student Steel Bridge Competition. Lakehead won 1st place in the Display category.

Congrats also to all the other winning Canadian teams!

ONTARIO GOVERNMENT INTRODUCES BILL 142, THE CONSTRUCTION LIEN AMENDMENT ACT 2017

If passed, Bill 142 will modernize the lien and holdback process, introduce needed rules to ensure Ontario construction workers get paid, on time, for the work they do, and make the dispute resolution process faster and simpler.

NEW CISC WEBSITE LAUNCHED

We're very pleased to have launched CISC's brand new website on June 5.

Our new website has been developed on the latest Wordpress.org platform and is designed to offer new functionalities, and a more visual and user friendly experience.

Our strategy for the website was to put STEEL and our members and associates at the forefront, promoting the strengths of our building material and the capabilities of our members and associates.

Additional new functionalities that are currently under development include:

a) Advertising opportunities exclusively for members & associates on our News and steelknowledge.ca blogs.

b) A careers section which will highlight both career streams available in the steel industry and post actual job openings from our members and associates.

CISC HOSTS POPULAR LUNCH & LEARN SEMINAR, "BUILD IT BETTER WITH STEEL" AT ROYAL ARCHITECTURAL INSTITUTE OF CANADA (RAIC) AND ONTARIO ASSOC. OF ARCHITECTS JOINT ANNUAL CONFERENCE, MAY 2017

CISC hosted a Lunch & Learn at the RAIC & OAA Festival of Architecture on May 24th presenting our case for steel: "Build it Better with Steel: Faster, cheaper, greener!" Holly Jordan, a Senior Associate of B+H Architects and Tareq Ali, CISC's Director of Marketing & Communications were the keynote speakers of this event. We had a strong interest from architects with over 35 registered to attend.

CISC showcased steel projects completed by our member and associates to over 1,800 architects in attendance at the conference and the trade show with our presentation and booth.

CISC PROMOTES STEEL AT THE CANADIAN SOCIETY FOR CIVIL ENGINEERING (CSCE) ANNUAL CONFERENCE

We actively engaged with structural and civil engineers, educators and students at our booth at the CSCE conference in Vancouver from May 31st–June 3rd, promoting the possibilities of steel, our new courses, publications and the solutions centre, and the capabilities of our members and associates. Over 700 civil and structural engineers attended this conference.

We delivered a keynote breakfast presentation on June 2nd on "What's new at the CISC" promoting our new courses, apps, publications and services to over 300 engineers.

ALBERTA REGION GOLF TOURNAMENT

Join us for the Alberta Region Golf Tournament on Monday, August 14, 2017 at BlackHawk Golf Club!

For player registration information, please contact our event coordinator Shelly Cameron at sch@telus.net

For event sponsorship opportunities, please contact Neil Kaarsemaker, Regional Manager Alberta & Saskatchewan at nkaarsemaker@cisc-icca.ca or 780-934-9557

NEW CISC MEMBERS AND ASSOCIATES (SINCE FEBRUARY 1, 2017)

MEMBERS

Fabricator:
Lakehead Ironworks Inc., 38 Haniak Road, Rosslyn, ON

Detailer:
JMT Consultants inc., 505-93 Lombard Ave, Winnipeg, MB

ASSOCIATES

North American Steel Mill Producer:
Steel Dynamics Inc., Structural & Rail Division, 2601 South County Road 700 East, Columbia City, Indiana, USA

Erector:
LML Industrial Contractors Ltd., 302, 4815 – 50th Street, Lloydminster, SK

Supplier:
Kathbern Management Consultants Inc., 20 Eglinton Ave West #1102, Toronto, (Region: ON)

Vulcraft Canada, Inc., 1362 Osprey Drive, Ancaster, ON (Eastern Regions)

National Consulting Company:
Stantec Consulting Ltd. Locations:
Mississauga, ON
Saskatoon, SK
Edmonton, AB
Calgary, AB
Victoria, BC
Vancouver, BC
Dartmouth, NS
Longueuil, QC
Ottawa, ON
Yellowknife, NT

Consultant Company:
Raymond S.C. Wan Architect, 50 Willow Avenue, Winnipeg, MB

Professional Individual Professor:
Ali Imanpour, University of Alberta, Assistant Professor, Civil and Environmental Engineering

Alexandra Trovato, NAIT, Professor, Construction Engineering Technology Program

Brian Sinclair, University of Calgary, Professor & Former Dean, Faculty of Environmental Design

Faouzi Ghrib, University of Windsor, Head of Department/ Professor, Civil and Environmental Engineering

Technical Individual Professor (Non-Professional):
Patrick Poulin, Centre de formation des métiers de l'acier, Commission Scolaire de la pointe de l'Ile, Professor, Structural & Architectural Erection Dept.

SASKATCHEWAN GOLF TOURNAMENT

Join us for the Saskatchewan Region Golf Tournament on August 25, 2017 at Moon Lake Golf & Country Club.

For general event information, please contact Neil Kaarsemaker, Regional Manager Alberta & Saskatchewan at nkaarsemaker@cisc-icca.ca or 780-934-9557

SAVE THE DATE: BC STEEL SYMPOSIUM ON OCTOBER 4, 2017

Make sure to mark this date in your calendars! Our panel of presenters will showcase the many advantages of steel construction with valuable resources for architects, engineers, developers, construction managers and general contractors.

19TH CISC QUEBEC STEEL DESIGN AWARDS OF EXCELLENCE GALA

Save the date for the 19th CISC Quebec Steel Design Awards of Excellence on November 6, 2017!

Get ready for a dazzling night of Steel. Don't forget your black tie and formal gown! We look forward to seeing you there! http://rendezvousacier.com/soiree-gala/

STEELDAY IS ON SEPTEMBER 15! SIGN UP TODAY!

SteelDay is an annual, national event that showcases the versatility, performance and sustainability of steel and its various innovative applications.

Attend a SteelDay event and learn how the steel industry can support your next project and assist you! Check out www.SteelDay.ca to see what events are near you!

CISC QUEBEC 4TH SYMPOSIUM WILL BE ON OCTOBER 23, 2017 AT ÉCOLE DE TECHNOLOGIE SUPÉRIEURE (ETS)

The theme for this event is "Speed Meeting with the Steel Industry". There will be many mini-technical conferences, plenary sessions and live demonstrations at this conference. www.rendezvousacier.com


COMMERCIAL SAND BLASTING & PAINTING
Protection Against Corrosion
Serving Western Canada since 1968
Saskatoon, Saskatchewan
306.931.2820 | office@csbp.ca
www.csbp.ca
Specializing in Industrial Coatings and Linings
We're ready to meet any of your protective coating and lining needs. We can work on your site or in our facilities, with large shops (60,000 sq ft), 40 acres of yard space, and cranes and forklifts on-site.
• Protective Coatings
• Plant Maintenance
• Shop and Field Service
• Tank Lining
• Environmental Containment
• Industrial Fiberglass
• Concrete Protection
• Structural Steel
• Abrasion and Tile Lining Systems
• Shotcrete
• Spray Polyurethane Foam Insulation
• Fire Proof Coatings
• NACE Certified Inspectors on Staff
• Industrial Standard Quality Program
• IS Networld & COR


Introducing ......
Kathbern Management
Talent Acquisition for the Steel Industry
How much time do you have?
Our objective is to quickly "get the right people on the bus" for our CISC clients.
• Middle or Senior Management
• Business development
• Technicians / Engineers
• Financial Leadership
• Sales Leadership
• Tech / Engineering Leadership
• Increase the speed of getting the right people on board
• Improve the quality of candidates that you are looking at
• Reduce the headaches involved in advertising, screening and scheduling interviews
Kathbern
MANAGEMENT
Fit is everything
larry.smith@kathbern.com | 416-915-4044 | www.steelteamrecruiting.com

Membership list as of June 22, 2017

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

MEMBERS

FABRICATOR
ATLANTIC

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

Design Built Mechanical Inc. B, Br, S
Charlo, NB 506-684-2765
www.dbminc.ca

Livingston Steel Inc. B, S
Summerside, PE 902-724-2424
www.livingstonsteel.com

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

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

RKO Steel Limited - Dartmouth Plant 2 Br, S
Dartmouth, NS
www.rkosteel.com

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

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. Br
Québec, QC 418-683-2561
www.canambridges.com

Canam-Buildings, a division of Canam Group Inc. J, S
Boucherville, QC
www.canam-construction.com

Canam-Buildings, a division of Canam Group Inc. - J, S
St-Gédéon de Beauce, QC 418-582-3331
www.canam-construction.com

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

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

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.
Oldcastle, ON 519-737-6007

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

Akal Steel (2005) Inc. B, P, S
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_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 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 Limited 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

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

Lambton Metal Service 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 416-675-6528

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

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

Refac Industrial Contractors Inc. P, S
Harrow, ON 519-738-3507
www.refacindustrial.com

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
Erin, ON 519-833-9009
www.trevcosteel.ca

Victoria Steel Corporation S
Oldcastle, ON 519-737-6151
www.victoriasteel.ca

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
www.abesco.ca

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

Lakehead Ironworks Inc. S
Thunder Bay, ON 807-622-0658
www.lakeheadironworks.com

Shopost 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 - Winnipeg Plant B, P, S
Winnipeg, MB 204-589-7371
http://ww.supremegroup.com

SASKATCHEWAN

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
www.iwlsteel.com

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
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

Empire Iron Works Ltd. J, P, S
Wabamun, AB 780-892-3773
www.empireiron.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 B
Nisku, AB 780-955-0360
www.hyduke.com

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

Metal-Fab Industries Ltd.
Rock View, AB
www.metal-fab.ca

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

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

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

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

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

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

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

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

Vulcraft Canada Inc. J
Nisku, AB 780-955-3390
www.vulcraft.ca

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

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

Supreme Steel Vancouver B, Br, P, S
Delta, BC 604-524-4421
www.supremegroup.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

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"

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

MILL

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

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

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

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

Dessins de Structures DCA Inc. B
Lévis, QC 418-835-5140
www.structuredca.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

JMT Consultants Inc. B, P
Winnipeg, MB 888-781-8952
www.jmtconsultants.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

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

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

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

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

AFFILIATE

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

ASSOCIATES

ASSOCIATE 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

Bourque Industrial Ltd
Saint John, NB 506 633 7740
www.bourqueindustrial.com

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

Century Steel Fabrications
Winnipeg, MB 204-233-3300

CNS Fabrication Ltd.
Bolton, ON 905-428-0031
www.cnsfabrication.com

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

Ed Lau Ironworks Limited
Kitchener, ON 519-745-5691
www.edlau.com

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

Ganawa Bridge Products and Services
Ajax, ON 905-686-5203
www.ganawa.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

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
http://drsteelinc.com

Danco Steel & Fabrication Ltd B
Edmonton, AB 780-668-0449

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

EMG Structures d'Acier Inc. B
St-Isidore de Laprairie, QC 450-454-6285

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

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

LML Industrial Contractors Ltd. B
Lloydminster, SK 306-825-6115

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
Laval, QC 450-786-1792
www.montacier.com

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

Stampa Steel Erectors Ltd. B, Br
Vaughan, ON 905-760-9988
www.stampasteel.com

Structures de Beauce B, Br, J, S
St-Odilon, QC 418-464-2000
http://structuresdebeauce.com

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

SUPPLIER

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 J.V.
Leduc, AB 780-980-9661
www.allfabmachinery.com

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

Amico Canada Inc.
Langley, BC 604-607-1475
www.amicoglobal.com

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

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

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

Buffalo Inspection Services
Edmonton, AB 780-486-7344
www.buffaloinspection.com

BuildingPoint Canada Inc.
Boisbriand, QC 1-855-922-6735
www.buildingpointcanada.ca

Burlington Automation
Hamilton, ON 905-689-7771
www.pythonx.com

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

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

Fisher & Ludlow, A Nucor Company
Edmonton, AB 780-481-3941
www.fisherludlow.com
Welded steel/ aluminum/stainless steel grating, "Grip Span" and "Shur Grip" safety grating

Fisher & Ludlow, A Nucor Company 604-888-0911
www.fisherludlow.com
Welded steel/ aluminum/stainless steel grating, "Grip Span" and "Shur Grip" safety grating

Fisher & Ludlow, une Compagnie de Nucor
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

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

Inland Steel Products Inc.
Saskatoon, SK 306-652-5353
www.inlandsteelproducts.com

Kathbern Management Consultants Inc.
Toronto, ON 416-915-4044
www.steelteamrecruiting.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

Leland Industries Inc.
Toronto, ON 416-291-5308
http://leland.ca

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

PPG Architectural Coatings Inc.
Concord, ON 905-669-1020
www.dulux.ca

Pure Metal Galvanizing
Mississauga, ON 905-677-7491
www.puremetal.com

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

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

SGS Canada inc.
Montréal, QC 800-361-1679
www.sgs.ca

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

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

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

STRUMIS LLC
Exton, PA 610-280-9840

Supreme Galvanizing Ltd
Brampton, ON 905-450-7888
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 floor/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 800-387-7135
www.vicwest.com

Vicwest Building Products
Winnipeg, MB
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

Vulcraft Canada, Inc.
Ancaster, ON 289-443-2000
www.vulcraft.ca

Wells Fargo
Montreal, QC 514-868-2303

NATIONAL CONSULTING COMPANY

Stantec Consulting Ltd, Calgary, AB 403-716-8000

Stantec Consulting Ltd, Edmonton, AB 780-917-1879

Stantec Consulting Ltd., Winnipeg, MB 204-489-5900

Stantec Consulting Ltd., Saskatoon, SK 306-667-2400

Stantec Consulting Ltd., Vancouver, BC 604-696-8176

Stantec Consulting Ltd., Victoria, BC 250-388-9161

Stantec Consulting Ltd., Dartmouth, NS 902-468-7777

Stantec Consulting Ltd., Longueuil, QC 514-281-1033

Stantec Consulting Ltd., Ottawa, ON 613-784-2303

Stantec Consulting Ltd., Yellowknife, NT 867-920-2882

Stantec Consulting Ltd.
Mississauga, ON 905-858-4424

CONSULTANT COMPANY

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

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

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

Bantrel Co., Calgary, AB 403-290-2800

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 (482), Halifax, NS 902-421-7241

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

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, Hamilton, ON 905-525-6069

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 iGL, Trois-Rivières, QC 819-841-4494

Groupe-conseil Structura international
Montréal, QC 514.360.3660

Haddad, Morgan and Associates Ltd.
Windsor, ON 519-973-1177

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

JML Engineering, Thunder Bay, ON 807-345-1131

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., Vancouver, 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., Markham, 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

ONEC Engineering Inc., Edmonton, AB 780-440-0400

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

Raymond S.C. Wan, Architect
Winnipeg, MB 204-287-8668

Read Jones Christoffersen Ltd.
Calgary, AB 403-283-5073

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 Inc. (Montréal)
Montréal, QC 514-393-1000

SNC Lavalin Power Ontario Inc.
Toronto, ON 416-252-5311

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

Tower Engineering Group Limited Partnership,
Winnipeg, MB 204-925-1150

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

WHM Structural Engineering
Burnaby, BC 604-484-2859

Wolfrom Engineering Ltd.
Winnipeg, MB 204-452-0041

Wood Group PSN, St. John's, NL 709-778-4000

WSP Canada Inc. (Brampton)
Brampton, ON 905-799-8220

WSP Canada Inc. (Markham)
Markham, ON 905-475-7270

WSP Canada Inc. (Montréal)
Montréal, QC 514-340-0046

WSP Canada Inc. (Mont-Tremblant)
Mont-Tremblant, QC 819-425-3483

WSP Canada Inc. (Sherwood Park)
Sherwood Park, AB 780-410-6814

WSP Canada Inc. (Victoria), Victoria, BC 250-384-5510

NORTH AMERICA 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

Steel Dynamics, Inc. Structural and Rail Division
Columbia City, IN 260-625-8100
www.stld-cci.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/

Manitoba Infrastructure
(Water Management and Structures)
Winnipeg, MB 204-391-5253
www.gov.mb.ca

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

Paul Daoust Construction & Associates Ltd.
Ottawa, ON 613-590-1694

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 403-826-4744

Dwain A. Babiak, Calgary, AB 403-338-5826

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

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

Louis Crépeau, Montréal, QC 514-931-1080

Jean-Pierre Dandois, Magog, QC 514-592-1164

Dominic D'Aquila, Montreal, QC 514-747-0550

Ameen DeRaj, Winnipeg, MB 204-800-2072

Harold Dibben, Trenton, ON 613-392-9287

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

Timothy P. Fraser, Bellingham, WA 360-937-0448

Alex Fulop, Vaughan, ON 905-760-7663

MEMBER AND ASSOCIATE PRODUCTS/SERVICES DIRECTORY

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
Jean-Paul Giffard, Quebec, QC	418-839-7937
Saint-Jean-Chrysostome, QC	418-839-7937
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
Movses R. Gulesserian, North York, ON	416-219-6651
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, MB	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
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, Chatham, ON	519-351-9612
Clint S. Low, Vancouver, BC	604-688-9861
James R. Malo, Thunder Bay, ON	807-345-5582
Frédéric Marquis, Montréal, QC	514-340-0046
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
Brian McClure, Nanaimo, BC	250-713-9875
Mark McFadden, Chatham, ON	519-351-9612
Glenn J. McMillan, London, ON	519-453-1480
Neil McMillan, Stittsville, ON	905-697-9698
Shane A. McShane, Peterborough, ON	705-749-0003
Konstantinos Mermigas, North Bay, 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
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
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
Erick Pepin, St-Georges, QC	418-228-2223
Michael Picco, Concord, ON	905-760-9688
Gérard Pilon, Valleyfield, QC	450-373-9999
David Prud'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
Ovidiu Serban, Laval, QC	438-345-9483
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
Jeffrey E. Snook, St John's, NL	709-730-7325
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	403-241-2578
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
Xiaoli Yuan, 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
Martin Kowalyk, Moose Jaw, SK	306-692-9594
Denis Mallet, Lutes Mountain, NB	506-855-3201
Patrick S. McManus, Cheyenne, WY	307-637-8422
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

PROFESSIONAL - PROFESSOR

M. Shahria Alam
University of British Columbia, BC

Charles-Darwin Annan
Université Laval, QC

Kaveh Arjomandi
University of New Brunswick, NB

Michael F. Bartlett
University of Western Ontario, ON

Dominique Bauer
École de Technologie Supérieure (ETS), QC

Tracy Becker
McMaster University, ON

Andre Begin-Drolet
Université Laval, QC

Geneviève Bérubé
Commission Scolaire de la Capitale/
CFP Neufchâtel, QC

Anjan Bhowmick
Concordia University, QC

Richard Borger
Mohawk College, ON

Rocco Carbone
Mohawk College of Applied Arts and Technology, ON

Patrice Caron
College Montmorency, QC

Constantin Christopoulos
University of Toronto, ON

Sreekanta (Sree) Das
University of Windsor, ON

Michael Dellar
Dawson College, QC

Serge Desbiens
Cégep de Jonquière, QC

Joe Di Cesare
Dawson College, QC

Robert G. Driver
University of Alberta, AB

Augustin Dukuze
University of New Brunswick, NB

Kyla DuSomme
SIAST, SK


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
cisc icca


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


moore
BROTHERS
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


PROFESSIONAL STRUCTURAL
& DETAILING SERVICES
CONNECTION
DESIGN
BIM
SERVICES
STEEL
DETAILING
WELDING
ENGINEERING
SKC Engineering (a division of Applus Professional Services) has over 30 years of structural engineering and detailing experience.
We are able to provide services quickly, effectively, and efficiently across Canada.
SKC
SKC ENGINEERING
Applus
SPECIALIZATIONS
Welded & Bolted Connection Design
Steel Detailing & Drafting
Building Information Modeling (BIM)
Structural Design & Analysis
Lifting & Erection Plans
Retained Engineer for CSA Welding Programs
OFFICES TO SERVE YOU ACROSS CANADA
www.applusrtd.com I www.skceng.com
T 604-882-1889

Ahmed El Refai
Universite Laval, QC

Mamdouh El-Badry
University of Calgary, AB

Bruce Elliott
Confederation College, ON

Bob Fencott
Loyalist College, ON

J. Jill Ferguson
Assiniboine Community College, MB

Denis Gagnon
Collège de Chicoutimi, QC

Claude Ghazal
College Montmorency, QC

Faouzi Ghrib
University of Windsor, ON

Antony Gillies
Lakehead University, ON

Riccardo Gioia
Concordia University, QC

Mohammad Givehchi
University of Toronto, ON

Yanglin Gong
Lakehead University, ON

Rishi Gupta
University of Victoria, BC

Ryan Habkirk
Georgian College, ON

Ahmed Hamada
University of Waterloo, ON

Abdul Hameed
Sheridan College, ON

Graham Huckin
Vancouver Community College, BC

Rodney Hunter
SAIT Polytechnic , AB

Ali Imanpour
University of Alberta, AB

Jin Hee Jeong
New Brunswick Community College (NBCC), NB

Heng-Aik Khoo
Carleton University, ON

Mark Krantzberg
George Brown College, ON

Scott Krieg
Saskpolytech Kelsey Campus, SK

Peter Kuzyk
Confederation College, ON

Jonathan Landry
La Cité Collégiale, ON

Abdul Nabi Lashari
Loyalist College, ON

Maura Lecce
Seneca College of App. Arts & Tech, ON

Frédéric Légeron
Université de Sherbrooke, QC

Yi Liu
Dalhousie University, NS

Mitko Mancevski
Conestoga College, ON

Bahman (Ben) Marvi
EPIC College of Technology, ON

Brandon McCready
NAIT, AB

Terry McKenna
Holland College, PE

Magdi Emile Mohareb
University of Ottawa, ON

Lesley Moulson
Lakehead University - Civil Engineering, ON

Phalguni Mukhopadhyaya
University of Victoria, BC

Bahman Noruziaan
Red River College of Applied Arts, Science and Technology, MB

Peter Olynyk
Mohawk College of Applied Arts and Technology, ON

Blaine Otteson
Saskatchewan Polytechnic, SK

Jeffrey A. Packer
University of Toronto, ON

Freddy Pina
University of British Columbia, BC

Gérard Poitras
Université de Moncton, NB

Patrick Poulin
Commission scolaire de la pointe-de-l'île, QC

Yves Rossignol
Université du Québec à Chicoutimi, QC

Sam Salem
Lakehead University - Civil Engineering, ON

Khaled M. Sennah
Ryerson University, ON

Lad Shaba
Northern College, ON

Andre Simoneau
University of New Brunswick, NB

Brian Sinclair
University of Calgary, AB

Nino Sirianni
St. Clair College - South Campus, ON

Ken S. (Siva) Sivakumaran
McMaster University, ON

Michael J. Tait
McMaster University, ON

Lucia Tirca
Concordia University, QC

Robert Tremblay
Ecole Polytechnique, CGM Dept., QC

Alexandra Trovato
NAIT, AB

Martin Turgeon
La Cité Collégiale, ON

Reza Ushaksaraei
McMaster University, ON

Scott Walbridge
University of Waterloo, ON

Jeff Walker
Cambrian College of Applied Arts and Technology, ON

Lydell Wiebe
McMaster University, ON

Gordon Wight
Royal Military College of Canada, ON

Lei Xu
University of Waterloo, ON

Tony T. Y. Yang
University of British Columbia, BC

Maged Youssef
University of Western Ontario, ON

STUDENT

Nahla Aboumansour
Concordia University, QC

Greg Abra
Red River College, MB

Faisal Abu Zeani
Concordia University, QC

Mohamed Afifi
McGill University, QC

Sarven Akcelyan
McGill University, QC

Mohamed Ali
Concordia University, QC

Simon Aniort
Concordia University, QC

Michael Arsenault
Red River College, MB

Navid Assemani
Concordia University, QC

Emma Astrom
Concordia University, QC

André Aubrey
Université Laval, QC

Karina Bagryan
Concordia University, QC

Farid Bakhti
Ecole Polytechnique de Montreal, QC

Cambria Banks
University of British Columbia, BC

Paul Baram
Concordia University, QC

Tariq Barghouti
Concordia University, QC

Gabriella Bédard
Concordia University, QC

Thierry Béland
Ecole Polytechnique de Montreal, QC

Megan Bennett
University of Alberta, AB

Valerie Bergman
Confederation College, ON

Jashan Bhullar
University of Manitoba (Civil Engineering), MB

Vincent Brière
McGill University, QC

Frederic Brunet
Ecole de Technologie Supérieure, QC

Saqib Butt
University of Waterloo, ON

Felide Caldani
Concordia University, QC

Michael Campanelli
Concordia University, QC

Maryse Campeau
University of British Columbia, BC

Pablo Cano
University of Alberta, AB

Freddy Celin
Collège Ahuntsic, QC

Samantha Champagne
Carleton University, ON

Kevin Chan
University of Alberta, AB

Amar Chand
University of Toronto, ON

Amit Chandra
Concordia University, QC

Monrit Chatha
University of British Columbia, BC

Allan Chen
University of British Columbia, BC

Akalu Cherie
Concordia University, QC

Dean Chevarie
Concordia University, QC

Benjamin Chevrier
Ecole de Technologie Supérieure, QC

Mathew Chrystian
University of Alberta, AB

Kai Jian Chuah
University of Alberta, AB

Spencer Collier-Jarvis
Dalhousie University, NS

Arthur Cooper
Loyalist College, ON

Maxime Corbeil
Concordia University, QC

Brock Cornelsen
University of Manitoba, MB

Ion Cujba
Concordia University, QC

Scott Dabbs
University of Alberta, AB

Sushanth Daniel
University of British Columbia, BC

Mark Derksen
Red River College, MB

Jeffrey Desaulniers
Loyalist College, ON

Hyacinth Domagala
Concordia University, QC

Nicholas Duhaime
Concordia University, QC

Roxanne Duigou
University of British Columbia, BC

Nguyet Duong
University of Alberta, AB

Matthew Ellis
University of Alberta, AB

Tariq Hashim Elsamani Elsheikh
Lakehead University - Civil Engineering, ON

Wenfrank Espada
Concordia University, QC

Dario Espi-Fournier
Université Laval, QC

Mohamed Ezzeldin
McMaster University, ON

Shanyao Fan
University of British Columbia, BC

Sofia Faraz
University of Manitoba (Civil Engineering), MB

Marco Fedele
Concordia University, QC

Luiz Fernandez
Red River College, MB

Gregory Flis
Confederation College, ON

Mathieu Fokwa Soh
Ecole de Technologie Supérieure, QC

Jessica Francis
University of British Columbia, BC

Cole Friesen
University of Manitoba (Civil Engineering), MB

Cornie Friesen
University of Manitoba, MB

Maha A. Ghaib
University of Manitoba (Civil Engineering), MB

Shervin Ghomi
University of Manitoba (Civil Engineering), MB

Jasninder Gill
University of British Columbia, BC

David Giroux
École de Technologie Supérieure (ETS), QC

Karla Gorospe
University of Windsor, ON

Dana Gray
George Brown College, ON

Jordan Greene
College of the North Atlantic, NL

Tala Harb
Concordia University, QC

Riley Hawryluk
Red River College, MB

George W Hill
University of British Columbia, BC

Tanveer Hossain
Concordia University, QC

Eliot Huang
University of British Columbia, BC

Brayden Hughes
University of Victoria, BC

Jeffrey Hung
University of Alberta, AB

Ahmed Hussein
University of Manitoba (Civil Engineering), MB

Brandon Hutchings
Red River College, MB

Sabih Islam
Concordia University, QC

Chris Jackson
George Brown College, ON

Rachel Jackson
University of British Columbia, BC

Emily Jacobsen
Ecole Polytechnique, CGM Dept., QC

John R Johnson
Lakehead University - Civil Engineering, ON

Alexis Jacob Juarez - Marroquin
École de Technologie Supérieure (ETS), QC

Mazhar Kakar
George Brown College, ON

Fariha Kamal
Concordia University, QC

Carol Kazmé
Concordia University, QC

Fredrick Kennedy
Sheridan College, ON

Dexter Kirby
Red River College, MB

Tallis Kirby
University of British Columbia, BC

Khadidja Komah
Concordia University, QC

Thomas Krausert
University of Alberta, AB

Michael Kwan
Concordia University, QC

Jay Lee
University of British Columbia, BC

François Leprince
CIMA+, QC

Miguel Lesenuo Oliviera
Concordia University, QC

Ryan Li
University of British Columbia, BC

Nenghui Lin
Concordia University, QC

Michael Louws
University of British Columbia, BC

Ethan MacLeod
University of New Brunswick, NB

Riley Madu
University of British Columbia, BC

Michel Jasen Mallet
Concordia University, QC

Amitehveer Mann
University of British Columbia, BC

Stuart Martinson
University of British Columbia, BC

Safa Sadat Masajedian
University of Alberta, AB

Angela Mason
University of Alberta, AB

Kyle McKee
Concordia University, QC

Masood Meidani
McGill University, QC

Dave Mercer
Memorial University, NL

Hossein Mohammadi
McMaster University, ON

Osama Mohsen
University of Alberta, AB

Pedram Mortazavi
University of Toronto, ON

Mohammad Motallebi Nasrabadi
McGill University, QC

Elaine Mukarakate
University of Alberta, AB

Paraskevas Mylonas
Concordia University, QC

Ehsan Nasirikhaneghah
Dalhousie University, NS

Onyekachi Ndubuaku
University of Alberta, AB

Finley Nduwayo
Concordia University, QC

Christine Nucciarone
Concordia University, QC

Christopher Ouma
George Brown College, ON

Luke Penner
University of Alberta, AB

Clayton Pettit
University of Alberta, AB

David Pizzuto
McGill University, QC

Kyle Price
Red River College, MB

Jonathan Puorto
Concordia University, QC

Shah Md Raad Sharar
University of Toronto, ON

Daniel Rachid
University of Alberta, AB

Andrei Radu
University of British Columbia, BC

Farnaz Raeisi
University of Manitoba, MB

Jimmy Renaud
Centre de formation professionelle
Maurice-Barbeau, QC

Cameron Ritchie
University of Toronto, ON

Devyn Rudd
University of Alberta, AB

Giovanni Ruotolo de Oliveira
University of Manitoba (Civil Engineering), MB

Emmanuelle Samson
Ecole Polytechnique de Montreal, QC

Lakchika Satkunanathan
Concordia University, QC

Mahmoud Sayed Ahmed
Ryerson University, ON

Zaynab Sbeiti
Concordia University, QC

Ardeshir Sedighi
University of British Columbia, BC

Feras Sheitt
McMaster University, ON

Ahmad Siam
McMaster University, ON

Brennan Slater
University of Manitoba (Civil Engineering), MB

Lucas Soares dos Santos
Red River College, MB

Taylor C. Steele
McMaster University, ON

Mandy Tam
University of British Columbia, BC

John Matthew Thibaudeau
University of Waterloo, ON

Frédéric Thibodeau
Ecole Polytechnique, CGM Dept., QC

Lisa Tobber
University of British Columbia, BC

Jessica Toone
University of British Columbia, BC

Kyle J. Tousignant
University of Toronto, ON

Stefan-Angel Trajkov
Red River College, MB

Stephen Tran
George Brown College, ON

Sharmaine Ugalde
Red River College, MB

Khelen Upadhyay
University of British Columbia, BC

Stephany Vinas Tapia
Concordia University, QC

Uzair Wasif
University of Manitoba (Civil Engineering), MB

Chandler White
University of British Columbia, BC

Colton Wooster
Red River College, MB

Nicolas Yedynak
Concordia University, QC

Jasen Yu
University of Waterloo, ON

Zhanpeng Zhang
University of Alberta, AB

Xiang Zhao
University of Alberta, AB

INDEX TO ADVERTISERS

ADVANTAGE STEEL

NO 58 SUMMER 2017

Publisher
Michael Bell
michaelb@mediaedge.ca

Senior Editor
Ali Mintenko-Crane
alim@mediaedgepublishing.com

Sales Executives
Bill Biber, Derek de Weerdt,
Kari Philippot, 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

Burgoyne Bridge, St. Catharines, ON

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

We recognize that the projects we contribute to are more than just projects. They change landscapes. They support key industries. They inspire people.

Walters Group is proud to have been a part of bringing the vision and structural innovation to award-winning projects since 1956.