ADVANTAGE STEEL

NO 49 SPRING 2014

Steel Bridges:
Leveraging the performance and versatility of structural steel for building Canada's infrastructure

+ Rehabilitation of three expressway bridges in Toronto

Restoring Red Willow River Bridge: An orthotropic steel deck solution

Port Mann Bridge: Expanding a Vancouver centrepiece

CANADIAN INSTITUTE OF STEEL CONSTRUCTION

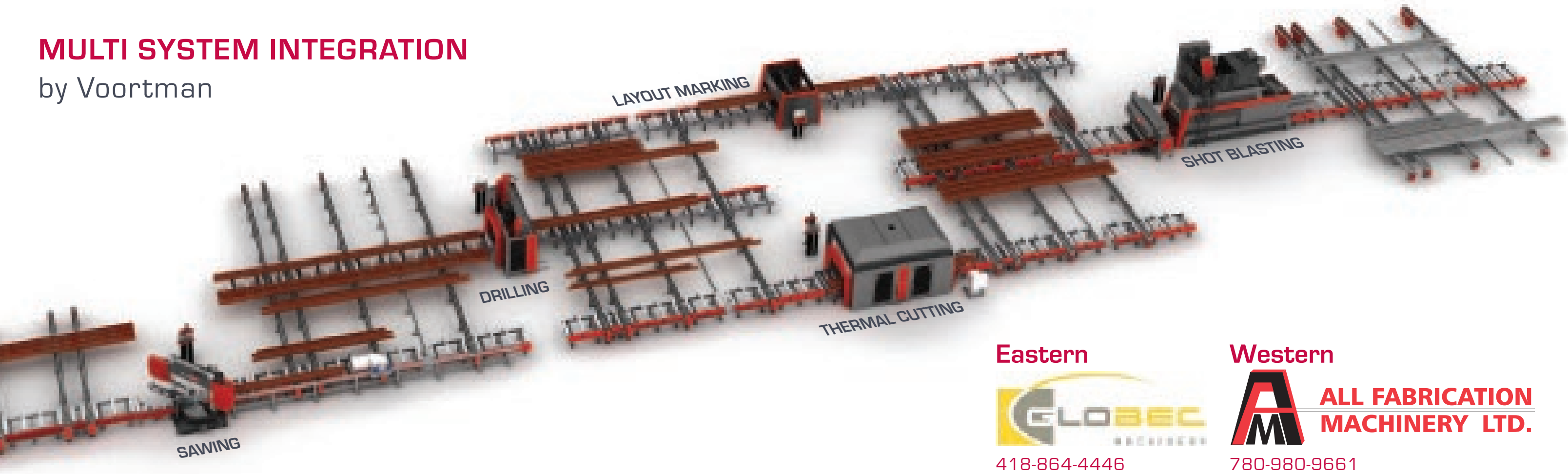
cisc icca
CANADIAN INSTITUTE OF STEEL CONSTRUCTION

PM#40787580

Voortman

SWITCH TO AUTO-PILOT WITH A VOORTMAN!

MULTI SYSTEM INTEGRATION
by Voortman



Eastern

GLOBEC

418-864-4446

Western

ALL FABRICATION MACHINERY LTD.

780-980-9661

AUTOMATIC MATERIAL HANDLING:

- Loads and unloads the processing system
- Intelligently decides which system to load next in a Multi System Integration
- Unmanned systems which reduce man hours

SINGLE SOURCE PROVIDER

- Plasma & oxy-fuel cutting
- Sawing and drilling
- Layout marking
- Shot blasting & painting
- Punching & shearing
- All products are designed and manufactured in house

BRIAN RITCHIE FROM SHEPARD STEEL:

"The Voortman V808 Robotic Cutting System has been in use in our production facility for over 5 months and has exceeded our expectations. We are using the V808 as a fabrication station cutting to size, burning holes and coping. We could not be happier with the production, service and support on all of our Voortman machines. Great equipment!"

VOORTMAN USA CORP.

Building F - 450 South Spruce St. | Manteno, IL 60950

(t) 1 815 468 6300 | (f) +1 815 - 468 6333

info@voortmancorp.com

www.voortmancorp.com

A VOORTMAN STEEL GROUP COMPANY

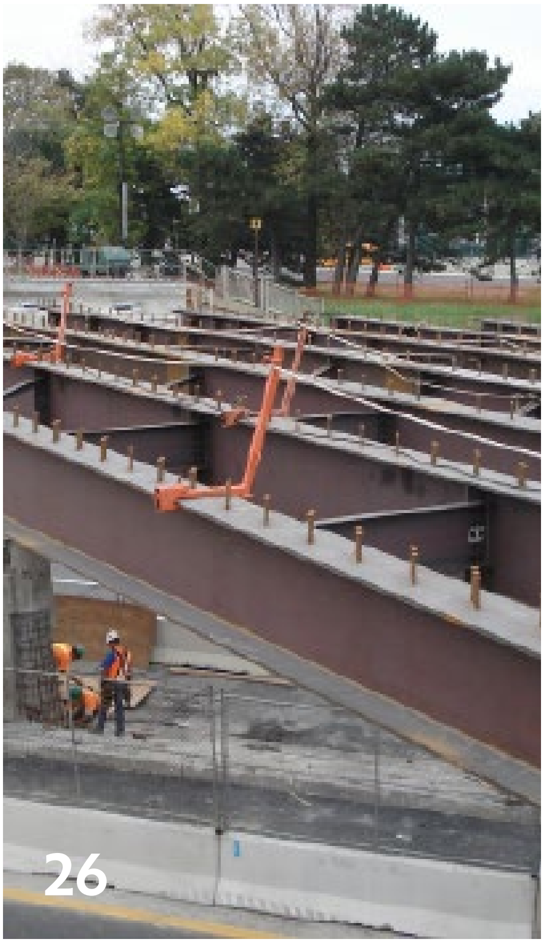
ADVANTAGE STEEL

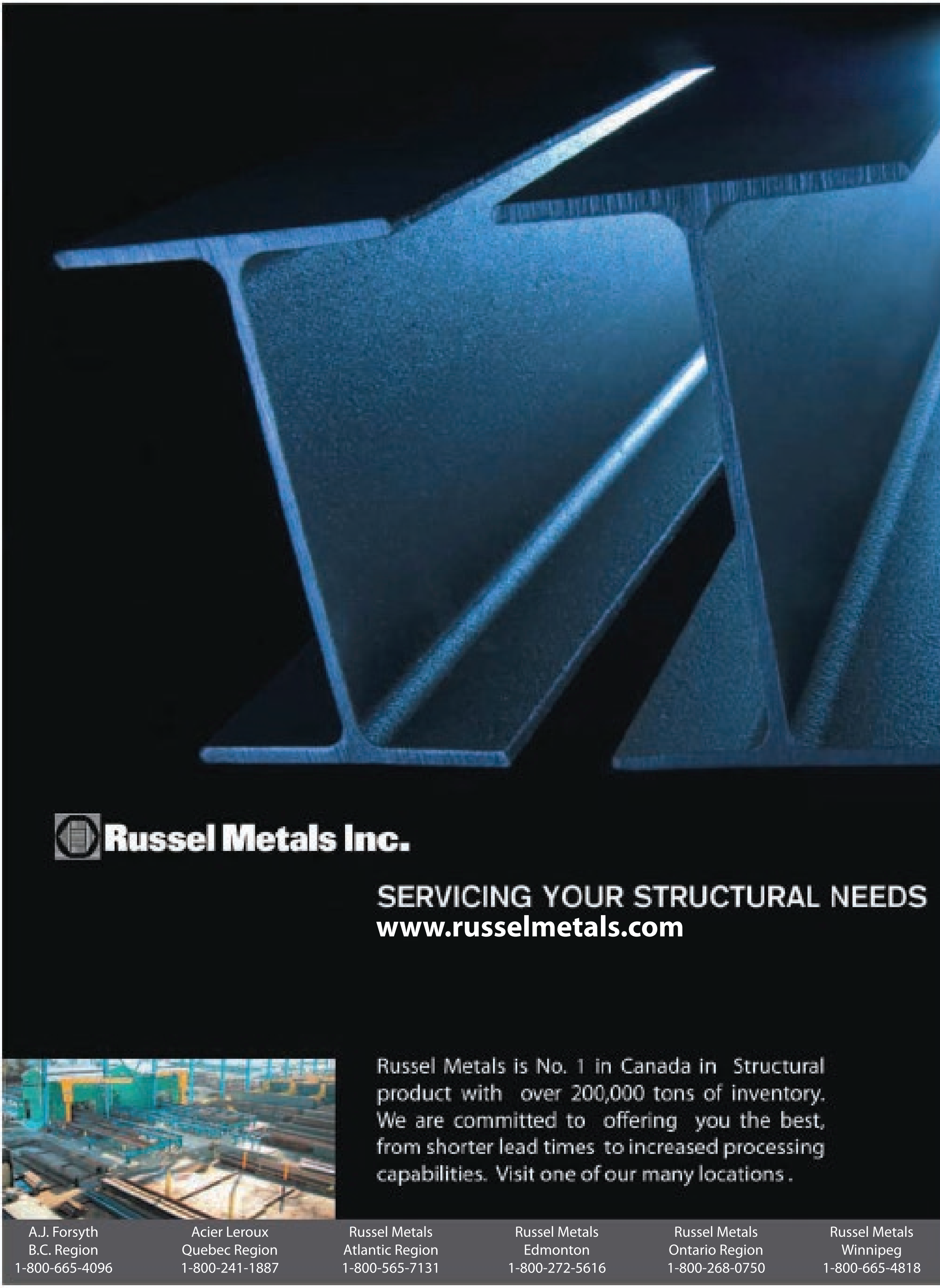
NO 49 SPRING 2014

IN THIS ISSUE

FEATURES

COLUMNS




Russel Metals Inc.
SERVICING YOUR STRUCTURAL NEEDS
www.russelmetals.com
Russel Metals is No. 1 in Canada in Structural product with over 200,000 tons of inventory. We are committed to offering you the best, from shorter lead times to increased processing capabilities. Visit one of our many locations.
A.J. Forsyth
B.C. Region
1-800-665-4096
Acier Leroux
Quebec Region
1-800-241-1887
Russel Metals
Atlantic Region
1-800-565-7131
Russel Metals
Edmonton
1-800-272-5616
Russel Metals
Ontario Region
1-800-268-0750
Russel Metals
Winnipeg
1-800-665-4818

By Ed Whalen, P.Eng.
President

GCs galvanize the Canadian trade contractors

I recently attended a pirate-themed construction association event in Saskatoon. As a mixed trade event, there were jokes about the thieves and pirates in the construction industry, and we all laughed in jest. It was a great evening, and somewhat of a foreshadowing event, as it turns out.

A few weeks later I witnessed what I personally call the final proof of why Canada desperately needs prompt payment legislation. The general contractors in the pirate form of the Fair Payment Reform Ontario (F-PRO) coalition showed their true colours, hoisted the pirate flag and opened the cannon doors when the *Prompt Payment Act*, or Bill 69, was quickly advanced into the Ontario Legislature Subcommittee by the Liberal government. The general contractors, as it turns out, never expected the National Trade Contractors Coalition of Canada (NTCCC) to get Bill 69 to Committee. It now appears that the general contractors never intended to support what they helped co-author.

In March, Bill 69, co-authored by the National Trade Contractors Coalition of Canada and the Ontario General Contractors Association (OGCA), made its way to the Ontario Legislature Subcommittee after all-party support in the Legislature in 2013. The bill was crafted to its final form after two years of negotiations with the OGCA and NTCCC. Senior representatives from PCL, EllisDon and Bird Construction, to name a few, were all active participants.

Leading up to the Subcommittee hearings at the last minute, the OGCA was on public record supporting the bill, only to reverse its position at the last minute, stating that, "The needs of the GCs have not been addressed." What?! Give me a break! With this kind of blatant baloney, is it any wonder why trade contractors in Canada are revolting, standing up for their rights, and speaking with one voice against the general contractors' bad behaviour?

So who is this group of "fair payment reformers?" The group is listed as Eastern Construction, ACS Infrastructure Canada, Carillion, Dragados Canada, EllisDon, PCL Construction, Bird Construction and AECON. Fair Payment Reform Ontario is asking the province and the trade contractors for fairness. Am I dreaming?! These same companies participated with OGCA and had two years to get it "fair." I suppose they had to set up a separate coalition from the OGCA to save face. Maybe OGCA has lost its support or has been used as a decoy. I say a spade is a spade no matter how you brand it. Shame on them all.

There is one group that prospers from conflict in the construction industry. Lawyers fearing that prompt payment would wreak havoc on their successful business model spun panic in the industry about lien incompatibility. Although the current Ontario lien legislation is in need of an update, linking the two was ludicrous and self-serving. Further confirmation of this was their demand that they have a seat at the new Attorney General's Committee to review the *Ontario Construction Lien Act* in conjunction with prompt payment. The lawyers see themselves as stakeholders in the construction industry, profit from it, and want an equal voice at the table. Unbelievable! Everyone wants our money.

I have a suggestion that can save a whole lot of committee time, lawyers' bills, and money lost to pirates. Prompt payment should say this: "Payment shall be paid by the owner directly to the trades and within 30 days." It is evident that the general contractors are clearly entrenched in the practice of non-payment for their own profit. They have been able to get away with it for so long and believe it is their right. We must take their hand out of the cookie jar for the good of the industry and economy. As a group, they can no longer be trusted.

In a recent decision of the NTCCC, provincial chapters of the organization will be formed. This will further galvanize and strengthen the voice of the true builders of Canada. Trade contractors do all the work, employ all the people, and take all the financial risk. The trade contractors are the real leaders in the construction industry, and the NTCCC will be our collective voice.

ADVANTAGE STEEL

Advantage Steel and the French-language edition *Avantage Acier* (available on request) are published by the Canadian Institute of Steel Construction (CISC) on behalf of its members. CISC is not responsible for the opinions expressed in this publication by those contributing articles. Visit us at **www.cisc-icca.ca** or Tel **905-946-0864**, Fax **905-946-8574**

cisc icca
CANADIAN INSTITUTE OF STEEL CONSTRUCTION

CHAIRMAN Jim McLagan, Canron Western Constructors Ltd.

MANAGING EDITOR Tareq Ali, CISC

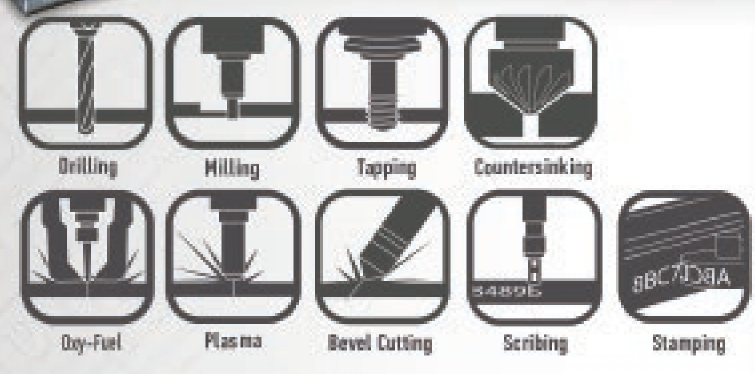
PUBLISHER MediaEdge Publishing Inc.
33 South Station Street
North York, ON M9N 2B2
Toll-Free: 1-866-480-4717 ext. 229
robertt@mediaedge.ca
www.mediaedgepublishing.com

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.

ISSN 1192-5248 PUBLICATIONS NUMBER 40787580

PLEASE RETURN UNDELIVERED COPIES TO:
Canadian Institute of Steel Construction
3760 14th Avenue, Suite 200
Markham, Ontario, Canada L3R 3T7

On the Cover: Top: The new Port Mann cable-stayed bridge. Bottom: The Simon Fraser bridge in British Columbia.



- Oxy-Fuel and Plasma bevel cutting systems
- Powerful 48 HP (36kW) Siemens spindle motor
- Roller Feed measurement system for continuous feed production
- 12-station automatic tool changer
- Minimum Quantity Lubrication (MQL) system
- SignoMat part stamping system
- Edge Start Cutting, Common Cutline/Chain Cutting Capable
  - Yield scrap as low as 5% in common structural applications
- Automated unloading systems available for streamlined removal of completed parts

www.peddinghaus.com | info@peddinghaus.com | +1 (815) 937-3800
web email phone


LAMBTON METAL SERVICE
SAFETY, QUALITY & SERVICE
Celebrating 10 Years!
LAMBTON METAL SERVICE
FABRICATING
CONTRACTORS
LMS
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
TSA Arc-Spray Metalizing
cisc icca
NACE
SSPC
306 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

www.infasco.com

Bolts & Nuts Manufacturer

INFASCO

Part of your plans !

Proudly Canadian

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

Question 1: When only one leg of an angle tension member is attached to its end supports, with longitudinal fillet welds, how do I determine if shear lag is important and how is it accounted for?

ANSWER: The effect due to shear lag in a tension member is usually accounted for by means of an effective area method. For weld-connected members, *Clause 12.3.3.3* of CSA S16-09 applies to members of various cross sections in general. The cross-section area of the angle is divided into two components, i.e., the attached leg and the outstanding leg. Figure 1(a) shows an angle connected by a pair of longitudinal welds of length, *L*. For the attached leg, shear lag is a factor when $L \leq 2w_2$. In accordance with *Clause 12.3.3.3 (b) (ii) and (iii)*, its effective net area, A_{n2}, as shown in Figure 1(b), is determined based on the weld configuration and, for short welds, also the leg thickness. The effective net area of the outstanding leg, A_{n3}, is calculated according to *Clause 12.3.3.3(c)*. Its shear lag effect is given as a function of the ratio of the eccentricity of the weld with respect to the centroid of the outstanding leg, *x*, to the weld length, *L*. Then the tensile resistance of the member is calculated in accordance with *Clause 13.2(a)(iii)* using the total effective net area of the angle section, $A_{ne} = A_{n2} + A_{n3}$.

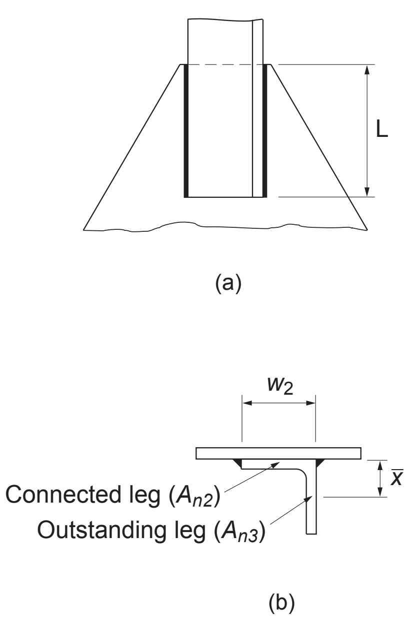


FIGURE 1 – EFFECTIVE NET AREA

Further information may be found in the CISC Commentary on CSA S16-09 in Part 2 of the Handbook of Steel Construction.

Question 2: I heard about the notional load requirement in the design of building structures but I cannot locate the notional load provision in the building code. Where do I find them?

ANSWER: You will find the provision for notional loads in CSA Standard S16-09, Design of Steel Structures. The Standard permits the second order effects due to gravity loads acting on the displaced structure under horizontal loads to be accounted for by using a P-delta analysis. In addition, the effects due to out-of-plumbness and partial yielding may be approximated by a set of horizontal loads, which are referred to as notional loads. The notional load to be applied at each level in addition to any other horizontal load is taken as 0.5 per cent of the concurrent gravity load acting on that level. Alternatively, a rigorous second-order analysis that accounts for both geometric nonlinearity, including out-of-plumbness, and partial yielding may be used.

Question 3: Where can I find the standard torque table for pretensioning A325 bolts?

ANSWER: The use of 'standard torque table' for pretensioning high strength bolts was discontinued several decades ago. When pretensioning is required, CSA Standard S16 recognizes three bolt installation methods:

a) Turn- of-nut method;
b) Using ASTM F1852 tension control bolt assemblies; and
c) Using an F959 direct tension indicator.

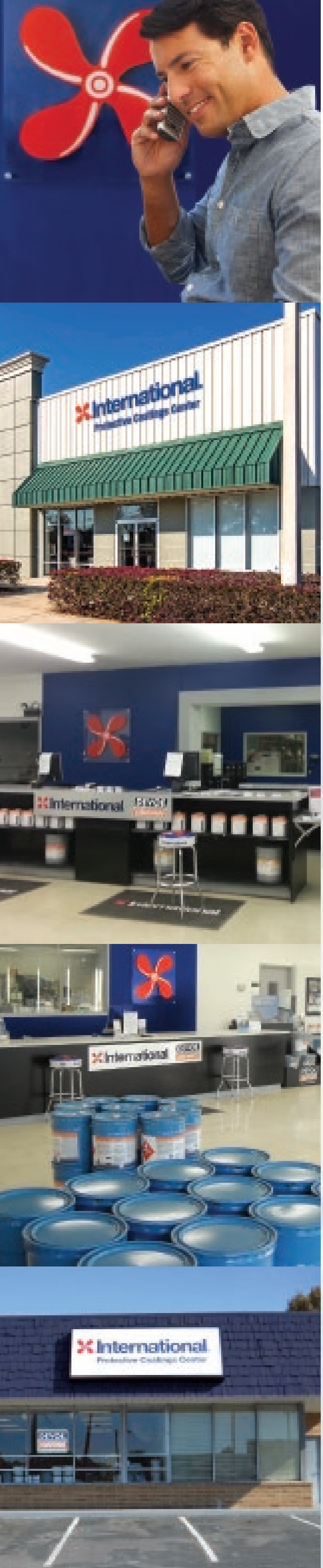
Both S16-09 and S16-14 assign a higher slip resistance to bolts installed by the turn-of-nut method versus the other methods for a given Class of contact surface, recognizing the larger pretension typically attained using the turn-of-nut method.

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

International

DEVOE HIGH PERFORMANCE COATINGS

Two leading global brands under one roof – it just doesn't get any easier than this



The recent opening of our International Paint Protective Coatings Centers marked the beginning of an exciting new frontier in bringing world-class protective coatings, linings, and fire-protection products directly to you. Today, new locations are opening throughout the US and Canada to give you even greater access to International Paint and Devoe High-Performance Coatings.

- Personalized, onsite color and tinting assistance
- Streamlined phone or in-person ordering – one easy-to-read invoice each month
- Fast and flexible pick-up and delivery options
- Direct contact with skilled technical, engineering, and customer service support teams

Visit http://info.international-pc.com/PCCenters to learn more about International Paint Protective Coating Centers and their locations.

The convenient, one-stop location for all of your high-performance coatings purchases!

For more information:

(855) 480-8127

pcmarketing.americas@akzonobel.com

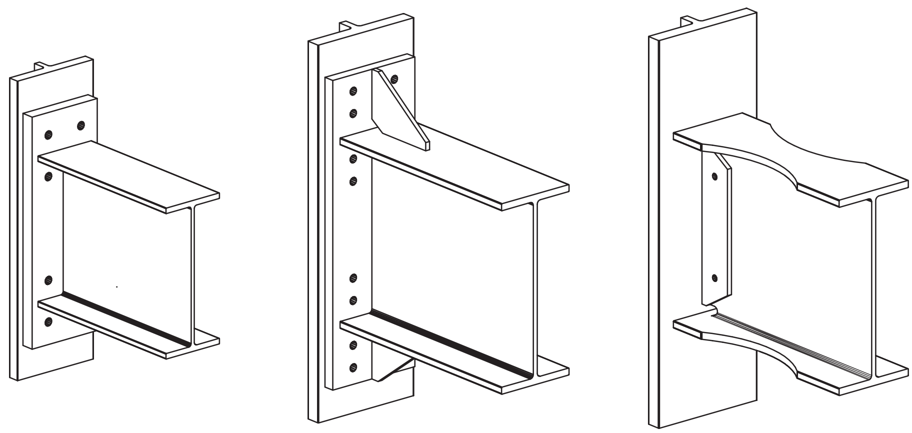
AkzoNobel

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

Moment-frame connections

Following the Northridge earthquake in 1994, North American standards mandated physical testing as the basis for design of beam-to-column connections in ductile steel moment-resisting frames. This requirement was adopted as an interim measure until the behaviour of these connections, particularly for welded connections, is well understood.

Extensive full-scale testing, supplemented with many analytical studies conducted since 1994, has expeditiously advanced the in-depth knowledge in ductile behaviour of several common connection types used in modern-day construction and in improved practical solutions. *ANSI/AISC 358-05, Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications*, a standard published in 2005, provides alternative solutions to physical testing. A similar approach is now taken in Canada. *CSA S16-14* adopts the CISC publication, *Moment Connections for Seismic Applications - 2nd Edition*, for the design of moment connections in *ductile, moderately ductile and limited-ductility moment frames*, as an alternative to physical testing.



A) BOLTED UNSTIFFENED END PLATE B) BOLTED STIFFENED END PLATE C) REDUCED BEAM SECTION

FIGURE 1 – MOMENT CONNECTIONS IN FIRST EDITION

CISC Moment Connections for Seismic Applications -1st Edition

The 1st Edition of this CISC publication was released in 2004. The design requirements were essentially based on *FEMA 350* and conform to the limits of validity established within the scope of the physical tests conducted in the *SAC* joint venture program. For example, frame members are restricted to rolled wide-flange shapes and column depth must be within those of W360 sections. The 1st Edition of this publication incorporated the reduced beam section connection and the bolted end-plate connection, with and without stiffeners, as shown in Figure 1.

CISC Moment Connections for Seismic Applications – 2nd Edition

This new edition, published in 2014, adopts the design philosophy and, in principles, the design requirements incorporated in *ANSI/AISC 358-10, Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications*. It

> "Extensive full-scale testing… has expeditiously advanced the in-depth knowledge in ductile behaviour of several common connection types "

provides requirements that are consistent with pertinent Canadian standards, such as S16-14 and W59-13. In addition to the connection types that are covered in the 1st Edition, it includes another field-bolted connection type, the bolted flange-plate connection, as shown in Figure 2. Other notable practical features include:

- Welded built-up sections;
- Box-shape, cruciform-shape and deep W-shape columns (See Figure 3);
- Expanded geometric validity range;
- Specific provisions for various details; and
- Designation of demand critical welds.

While the connection types included in the 2nd Edition cover most practical applications in Canada, it is not CISC's intent to restrict or discourage the use of other connection types that are proven suitable by means of physical testing in accordance with Annex J of S16-14. It should also be noted that the limitations and restrictions for their use have been adopted from *ANSI/AISC 358-10*. Connections that fall beyond the range of these limitations and restrictions but are proven appropriate by the said physical testing also conform to S16-14.

Limited-ductility Moment-resisting Frames

Although Cl. 27.4.4.2 of S16-14 provides prescriptive requirements for the design of moment connections used in *limited-ductility moment frames*, the clause applies to frames having I-shape columns and beams welded directly to the columns only. CISC *Moment Connections for Seismic Applications - 2nd Edition*, covers connections that are suitable where columns of other shapes are used and/or when field-bolting is desired.

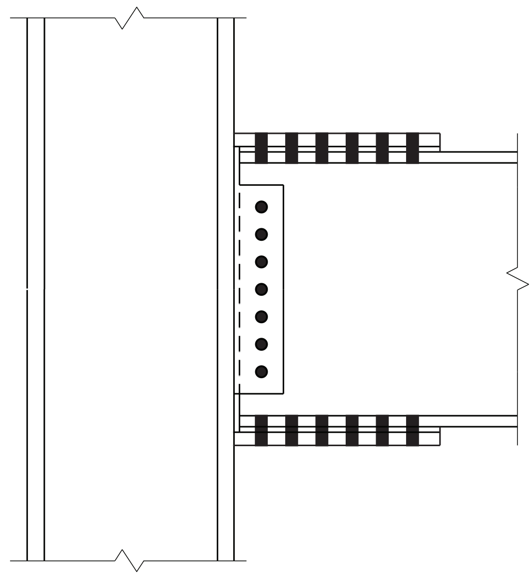


FIGURE 2 – BOLTED FLANGE PLATE

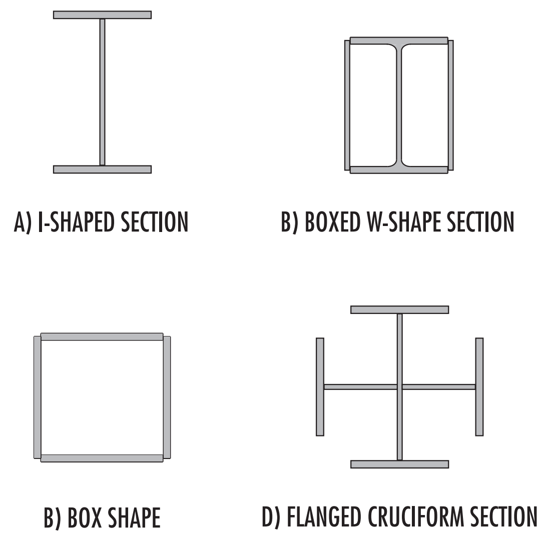


FIGURE 3 – COLUMN SHAPES

VIKING™

WELDING HELMETS

INDUSTRY LEADING OPTIC QUALITY 1/1/1/1

TOP LEVEL QUALITY ON FOUR PARAMETERS

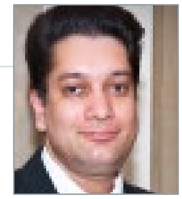
The **NEW VIKING™** auto-darking cartridges offer a 1/1/1/1 optical clarity rating. The ratings correspond to four very important optical categories. Each category is graded on a scale of 1-3 with a score of 1 being the best and 3 being the lowest quality. The VIKING™ upgraded line offers a perfect 1/1/1/1 clarity rating.

PREVIOUS 1/2/1/1 OPTICAL CLARITY (3350 SERIES SHOWN)

NEW 1/1/1/1 OPTICAL CLARITY (3350 SERIES SHOWN)

LINCOLN ELECTRIC
THE WELDING EXPERTS®

By Tareq Ali, RPM
Director of Marketing

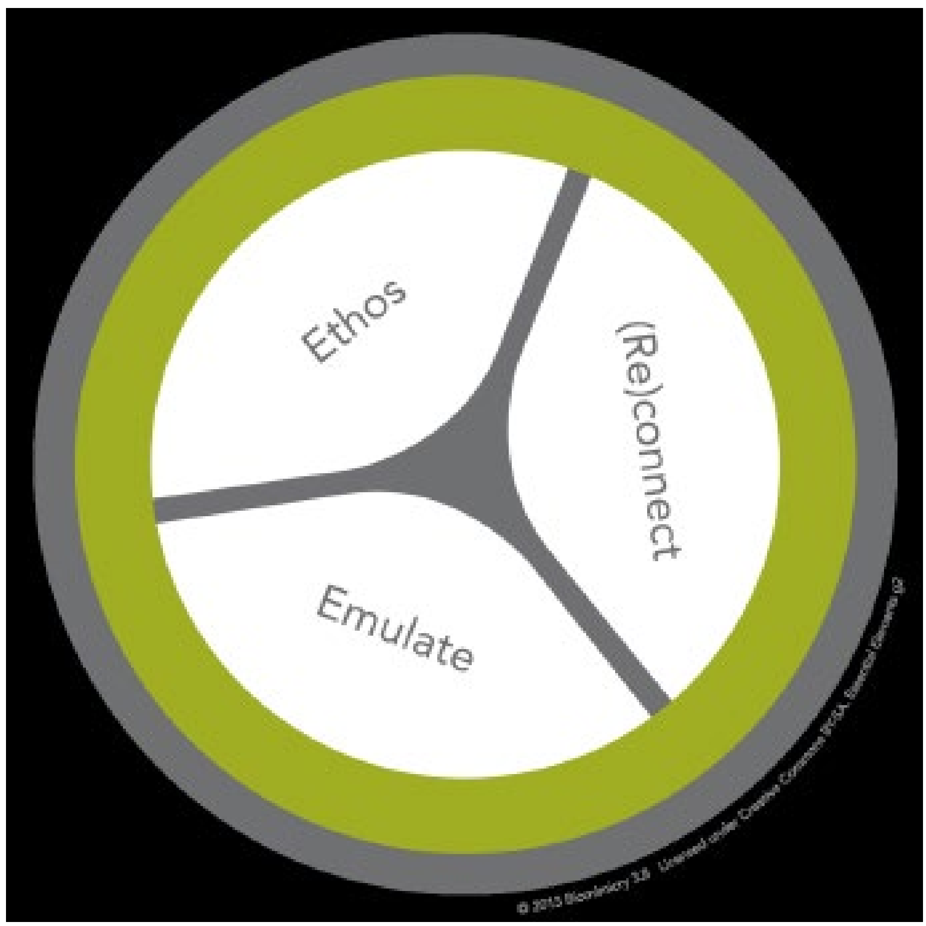


Biomimicry: Drawing design inspiration from Mother Nature

The term "Biomimicry" was popularized in 1997 by biologist and innovation consultant Janine Benyus with the publication of her book, *Biomimicry: Innovation Inspired by Nature*. The term comes from the Greek words bios, meaning life, and mimesis, meaning to imitate. So biomimicry simply means to imitate life, but more specifically it involves taking the forms and functions observed in nature and developing them into solutions for human problems.

The concept focuses on taking the 3.8 billion years of research and development that nature has been performing through evolution and adapting and applying it to real world problems. One of those real world problems is finding ways to build green and sustainable buildings. In construction, biomimicry is being used to inspire design elements in architecture, engineering better building systems and developing building materials that are stronger and more eco-friendly.

At its most basic, the practice of biomimicry encompasses three aspects we call the Essential Elements:



The **ethos** element represents our respect for, and responsibility to, our fellow species and our planet.

The **(re)connect** element reinforces the understanding that, while seemingly "separate," people and nature are actually deeply intertwined. It also represents a practice and commitment to seek out connection with the rest of nature as a source of creativity and wisdom.

And finally, the **emulate** element is learning from the patterns, strategies and functions found in nature and

In construction, biomimicry is being used to inspire design elements in architecture, engineering better building systems and developing building materials that are stronger and more eco-friendly.

applying those lessons to inform human design.

Biomimicry is quickly gaining popularity as a leading edge, integrative approach to building design, construction and operation.

For example, photovoltaic systems, which harvest solar energy, are a first step at mimicking the way a leaf harvests energy. Research is underway to create solar cells that more closely resemble nature. These cells are water-gel-based – essentially artificial leaves – that couple plant chlorophyll with carbon materials, ultimately resulting in a more flexible and cost-effective solar cell.

Building product manufacturers are also drawing inspiration from biomimetics by studying the structure and self-cleaning surfaces of the Lotus leaf. Their research findings are driving the development of commercial coatings for self-cleaning surfaces, so they rarely have to be cleaned. Any grime that has managed to cling to a surface is simply washed away by the next rain. The materials can also be used to coat the interior of pipes, reducing clogs.

Ant colonies are being studied to understand their intricate movement patterns, and this is then used to develop integrated global logistics systems.

Additional research is underway to explore biomimetic ideas and products that have the potential to help the construction industry and its clients with demands for:

- Reduced embodied energy (CO_2) in construction products;
- Reduced materials use, better resource efficiency and hence lower cost;
- Reduced weight and complexity (lighter structures, response to manual handling regulations, etc.);
- Novel designs; and
- Reduced maintenance burdens (intervals and costs).

The growing practice of biomimetic design and thinking promises to be a powerful force in shaping sustainable construction and the development of products, services, tools and resources that will help the construction industry build smarter, greener and cleaner buildings and structures in the future.

Resources & credits:
wbdg.org
Bre.co.uk
Sustainableleadersnetwork.org

Steel Bridges

Leveraging the performance and versatility of structural steel for building Canada's infrastructure

By Matthew Bradford

From Alberta's Red Willow Bridge to the complex erection of three bridges over Toronto's Gardiner Expressway, the advantages of steel are on display in transportation structures across Canada. Combined, these projects showcase the strength and utility of one of the industry's most versatile materials, as well as that of the CISC members and associates who reinforce steel's reputation with each new build.

"CISC members are known for working on pretty sophisticated and complex bridge structures right across Canada," says Steve England, chair of the CISC National Bridge Committee and vice president of Cherubini Group. "They've also been in business for a long time, so they have the experience, they have the knowledge, and they've built a great rapport with owners, designers, general contractors and transportation agencies. That goes a long way."

CISC bridge fabricator members have left their mark from coast to coast. For this issue of *Advantage Steel*, CISC turns its attention to some of the most recent projects to highlight a portion of the steel industry's success within the Canadian construction sector. "We like to highlight our products, because we're proud of what we do," says England.

The benefits of using structural steel for bridge construction have been well documented; especially when compared to competing bridge materials. Speaking to steel's advantages over reinforced concrete, for example, CISC Solutions Centre director Alfred Wong notes steel provides more strength at a lower weight, making it an ideal choice for long spans. Using steel on remote sites also reduces the amount of material that needs to be shipped, further controlling transportation costs and related environmental emissions. Moreover, Wong notes steel's lighter properties contribute to better overall quality. "Lighter structures attract lower seismic forces and more economical substructures," he says.

When compared to cast-in-place concrete construction, Wong adds that steel construction offers additional advantages. "Steel is typically more economical, and the fact that there is no formwork needed allows for a much faster erection, thereby minimizing traffic disruptions," he explains. "What's more, when it comes to re-decking, steel usually allows for a simpler, faster and more economical outcome."

Wong says CISC's Solution Centre research has shown steel provides for greater flexibility compared to other materials, including precast concrete girder bridges. "Horizontally and vertically curved structures preclude the use of precast concrete girders. Moreover, steel's inherent strength and stable long-term properties permit economical solutions where bridge clearance dictates a shallow superstructure," Wong explains.

Performance and durability notwithstanding, the use of steel can significantly add to the esthetic value to a project, offering designers and crews the wherewithal to create structures that not only last longer, but are more striking and pleasing to the eye. "Steel is very malleable in that sense, in that you can basically do anything you want," offers England.

The upsides of using steel in the construction of bridges are many. So too are the benefits of supporting the Canadian steel industry itself. Many of today's bridges are fabricated and produced within Canada, meaning owners benefit from reduced shipping costs while the country itself benefits from resulting economic activity and job creation. "It's important that the Canadian public know these are being built and fabricated here in Canada, so we can support jobs and our economy," says England.

Read on to see just some of the bridge projects that have done their part to lift the profile of steel and CISC members on the national construction stage.

Photos in this article courtesy of Mometal Structures Inc., ES Fox Ltd. and Soncin Construction.

High capacity

By Andrew Brooks

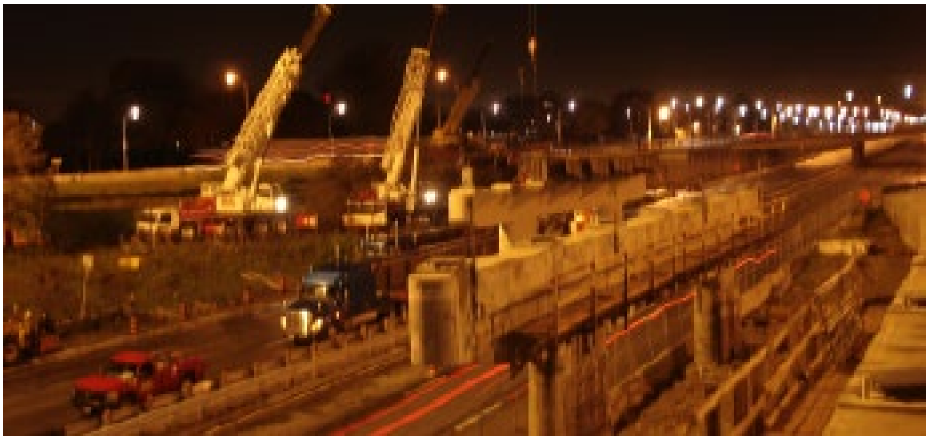
Structural steel allows the City of Toronto to increase vertical clearance during the rehabilitation of three vital expressway bridges

Keeping traffic moving along major expressways in a large metropolitan area is a challenge at the best of times, as any frustrated rush-hour commuter can tell you. But think of the challenge faced by those who have been given the job of reconstructing a bridge that not only crosses one such expressway, but carries a second. Then multiply the task threefold.

That was the challenge facing the project managers responsible for the complete rehabilitation of the concrete superstructures of three bridges in downtown Toronto in 2010. The bridges cross Toronto's Gardiner Expressway, the major east-west artery carrying traffic into the city's downtown core. Two of the three bridges carry Lakeshore Boulevard West, another east-west artery and one that is only slightly less important than the Gardiner itself.

The Frederick G. Gardiner Expressway – usually referred to as "the Gardiner" – was built in sections from 1955 to 1964. The highway has had its controversies over the years, mostly related to the elevated section of the roadway that extends from Dufferin Street, just east of the zone covered by the rehabilitation project (an area where the Gardiner actually runs below grade) eastward along the city's lakefront as far as the Don River. The use of road salt during the winter is tough on this elevated portion, necessitating expensive maintenance and frequent repair. And not all residents are happy with its aesthetics. Over the years, proposals have been floated to upgrade Lakeshore Boulevard and eliminate this part of the Gardiner entirely, or lower it to grade, or even bury it.

Love it or hate it, Torontonians heavily depend on the Gardiner, one of the city's busiest thoroughfares. Everyone *Advantage Steel* spoke with about the project agreed that traffic management was the most significant challenge they faced. And since two of the bridges carry Lakeshore Boulevard West's westbound lanes, it was here that traffic management was the real issue. These lanes carry an annual average daily traffic volume of more



than 29,000 cars – a bit over 9,800 for each lane. Volume usually peaks in the afternoon rush hour, with around 3,000 vehicles an hour.

In 2010 the City of Toronto determined that the concrete superstructure of all three bridges had deteriorated to the point that it was beyond feasible repair. The only alternative was reconstruction. The city chose AECOM as the consulting engineer for the project.

AECOM's Srdjan Brasic, project manager for the job, says that concrete was considered for the new superstructures before structural steel was chosen. Steel won out, he says, in part because of its suitability for one of the project's other objectives.

"The city wanted a shallower structure in place than what was there previously," Brasic says. The existing vertical clearance over the Gardiner was within the legal requirements, of course, but the city wanted to take the opportunity to increase it. "We looked at other types of structures but found that we could only get that improved clearance by using steel."

Brasic says that alternative materials would have required changing the geometry of the Gardiner's road surface. That was far beyond the scope of the bridge rehabilitation project and would have amounted to an entirely different project of tremendous scope that involved huge difficulty, expense and disruption of traffic.

A number of traffic management options were considered, and in the end it was decided to create a temporary three lane detour for the westbound Lakeshore, starting at the intersection of Lakeshore and British Columbia Road and

The Bridges:

- Bridge 009 (two spans) carries Lakeshore Boulevard West's westbound lanes from the south side of the Gardiner Expressway to the north side, at Dunn Avenue.
- Bridge 008 (two spans) lies between the other two and carries Jameson Avenue's northbound and southbound lanes over the Gardiner to meet Lakeshore Boulevard West's eastbound lanes, which run south of the Gardiner. (Lakeshore Boulevard West's westbound and eastbound lanes are separated where they run through the project zone.)
- Bridge 006 (four spans) carries Lakeshore Boulevard West's westbound lanes from the north side of the Gardiner back to the south side, just west of Jameson Avenue.

ending just west of the wing walls of the Jameson Avenue bridge (Bridge 006). The total detour length was around 800 metres. A temporary intersection at Jameson Avenue and Lakeshore eastbound and westbound, complete with temporary traffic signals, was also constructed.

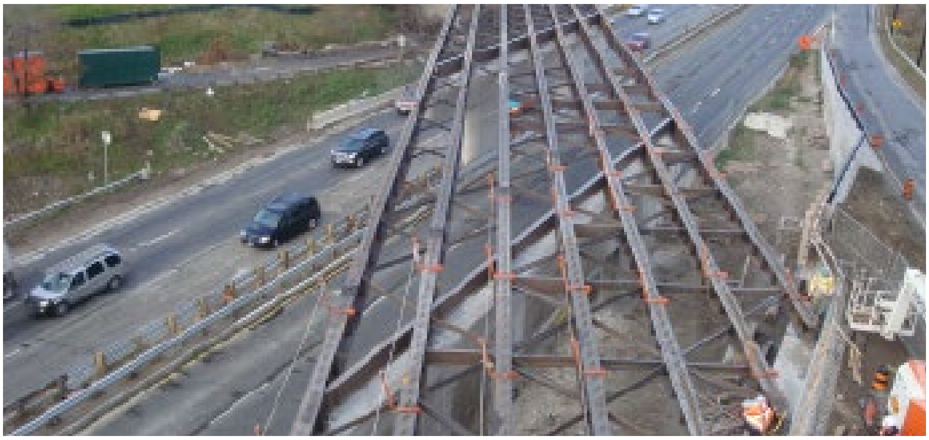
The project got underway on May 1, 2010. While high priority was assigned to minimizing traffic disruption, the Gardiner did have to be completely closed over three weekends to allow the demolition of the existing reinforced concrete superstructures. Otherwise, the expressway was reduced to two of three total lanes. During erection of the steel girders the Gardiner had to be completely closed in a single direction at a time. These closures were timed as much as possible to non-peak hours.

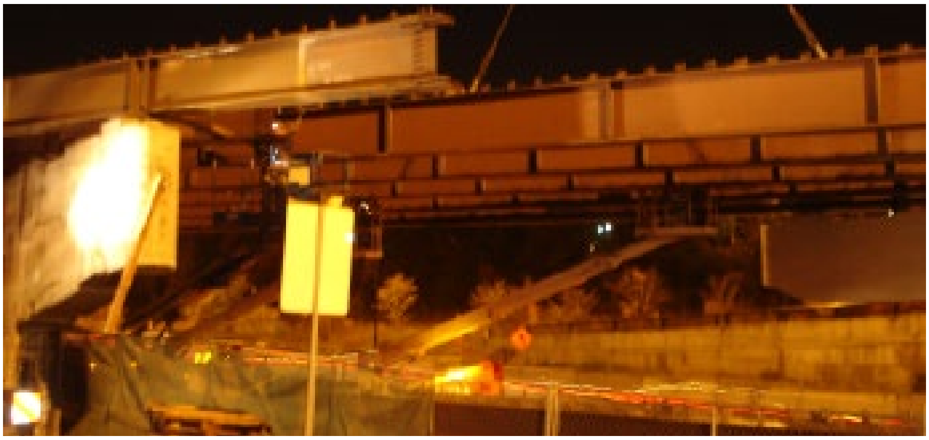
"The most challenging constraint to the steel erection was that the Gardiner Expressway had to remain open for two lanes in each direction except for a very limited number of planned closure weekends," says Clyde Crocker, P. Eng., project manager for Soncin Construction, the construction company on the project. "As such, field splices had to be designed so that the splice locations occurred in lane-closed areas wherever possible."

Steve Matthews, division manager, Structural Steel and Bridge Division for E.S. Fox Ltd., the Niagara Falls-based erector, also says that maintaining traffic flow on the two busy roadways was the primary challenge during construction. Matthews particularly commends the work of Soncin Construction in managing the overnight road closures that enabled the erection work to go smoothly. "Soncin was great to work for and they performed their own road closures," he says. "This was a big part of the success of the project."

The girders were fabricated by Mometal Structures Inc. in Montreal. "The taper in the girders, their length and transport, were among the distinguishing features of this job," says Mometal president Joseph Ciccarelli. "But none of that presented any particular challenge for us. It's actually more on the simple side of the work we do. We aren't set up to do volumes of any one thing – the more things are off the beaten path, the more value we can bring to a job."

Getting the completed steel pieces to the work site required fabricating the girders in smaller sections that could be field spliced once onsite. The success of the onsite field splicing was ensured





by shop matching of the girders before delivery, Ciccarelli says. As well, the onsite areas where the splicing took place were outside active traffic lanes, which also made the job easier.

"Some items that I presented at the time of tender were to make the girders longer and eliminate some of the splices shown on the bid drawings," says Steve Matthews. "This did happen for the Jameson bridge and the Dunn and Lakeshore structure (Bridge 009)."

Between four and eight girders could be erected a night, depending on how many cranes were in operation. "It was a very short window over the highway for crane assembly, steel erection and crane dismantling," Matthews says. "Staging girders and preparing the splices, installing the fall arrest system, etc., were all done ahead of time to ensure the least amount of time required during the closure." Shop-welded lifting lugs were added to the girders to speed erection.

Soncin was able to complete the closures, which covered the 12 a.m. to 4 a.m. window, in 15 minutes. "We'd have the cranes and girders prepared and ready to roll out onto the closed Gardiner," Matthews says. "The cranes would be prepared prior to the closure to ensure they were ready to work in the configuration required. The crane placement and erection procedures were all engineered by our engineer George Paul."

The precision of these operations was a huge contributor to the eventual success of the project. Work was mostly completed on July 28, 2011, six months ahead of schedule, and within the $14.5-million project budget. That's an excellent result for any project, public or private sector.

Increases in vertical clearance in metres

Bridge	Previous	New
Bridge 009 (at Dunn Ave.)	4.58	5.29
Bridge 008: (Jameson Ave.)	4.69	5.15
Bridge 006: (west of Jameson Ave.)	5.33	5.35

(Courtesy AECOM)

Design and fabrication details

Bridge	Spans (metres)	Total tonnes (mega gram)	Girder segments	Field splices per girder
Bridge 006 (Lakeshore Blvd. west of Jameson)	Four spans: 20.3m, 34.1m, 34.1m and 20.3m	370	7	4
Bridge 008 (Jameson Avenue)	Two spans: 22.4m and 22.4m	148	9	2
Bridge 009 (Lakeshore Blvd. at Dunn Ave.)	Two spans: 25.9m and 27.4m	157	7	2

(Courtesy AECOM)


REBUILDING AMERICA
NUCOR
NUCOR-YAMATO STEEL
GRAND OPENING

Restoring Red Willow River Bridge

Implementing an orthotropic steel deck solution ensures an efficient bridge rehabilitation

Eric Levesque, ing., M.Sc. &
Yannick Martin, ing. jr.

Structal-Bridges took the initiative and proposed a lightweight solution to Alberta Transportation in order to rehabilitate the Red Willow River Bridge in Northwestern Alberta. As the existing concrete deck of the three-span bridge reached the end of its service life, Alberta Transportation looked for an economic solution for its rehabilitation and considered Structal-Bridges' proposal to be appropriate. Therefore, Structal-Bridges brought technical support to the engineering firm Focus located in Edmonton to develop the preliminary concept for an innovative orthotropic steel deck solution. Alberta Transportation decided to move ahead with the concept; Focus and Roche then performed the detailed engineering of the project.

Orthotropic Steel Deck

Orthotropic steel decks (OSD) used in bridge applications are basically made of a large deck plate, stiffened on the underside by transverse floorbeams and longitudinal members, namely the ribs and the inverted Ts. Components are manufactured and welded together into several transportable prefabricated panels that can be easily brought on-site and rapidly erected for bridge construction as well as bridge rehabilitation projects.

Design

The system is fabricated with corrosion-resistant steel plates. Comprehensive finite element analysis has been carried out to ensure that all the fatigue details meet the requirement of Canadian Standards CSA-S6-06 for Class-B roadway with two design lanes and CL-800 design vehicle. Traffic barriers with PL-2 performance level are mounted on the side of the deck with bolt-through connection.

Although the concrete deck of the Red Willow River Bridge has to be replaced, the good condition of the existing longitudinal steel girders allowed for their reuse. The OSD system was designed to be attached to the girders with slip-critical bolted connections in order to develop full composite action in the superstructure and increase the live load capacity of the girders. The efficient use of steel material within the components of this OSD configuration leads to a lightweight structure. While the width of the bridge deck has been increased from 7340 mm to 8940 mm (with 1156 mm deck overhang), the overall mass of the deck has been reduced from approximately 283 to 168 metric tons, which represents a 36 per cent mass reduction. This

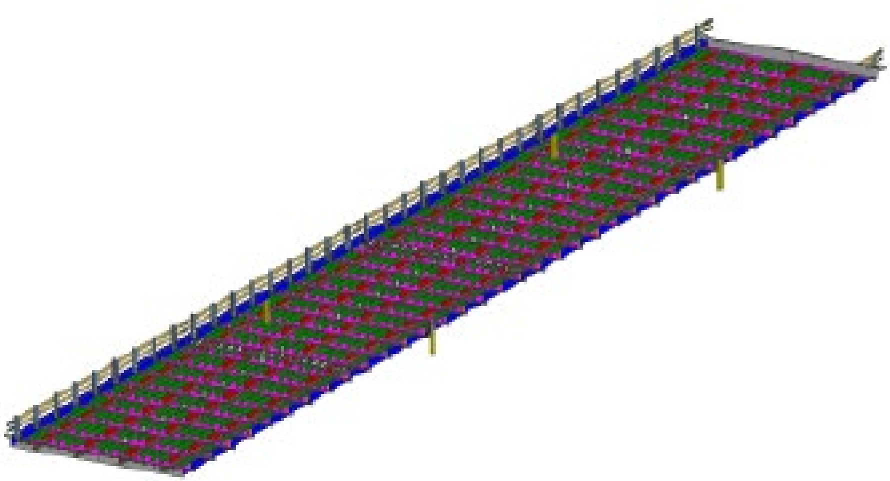


FIGURE 1: 3D MODEL BUILT BY STRUCTAL-BRIDGES' DRAFTING TEAM

weight saving allowed for the bridge to withstand the actual traffic loads without replacing or reinforcing the existing girders, which results in significant economic benefits on the overall cost of the project.

Fabrication

Shop drawings have been produced from a 3D model built by Structal-Bridges' drafting team (Figure 1), based on the engineering plans. Shop programs are created from the model and are numerically imported into CNC machines for cutting and drilling operations, so the parts are fabricated as modelled. From the machining of the first components to the final assembly of the deck,

Steel as the best solution

Dominique Blouin, construction and business development manager at Structal-Bridges, comments on the choice of building material

"Structal's orthotropic steel deck solution used on the Red Willow Bridge project was the best solution for this two-lane bridge. It is the perfect product for a quick deck replacement over existing girders. Contrary to a conventional concrete deck, this replacement can be performed even in harsh winter conditions while allowing for traffic on the second lane. This deck is easy to install using only conventional steel erection equipment. Studies performed over the last decades have led to North American specifications that support well the design and fabrication of an orthotropic steel deck. That research improved critical welding details as well as quality control procedures which will enhance deck performance and allow it to be designed for a 75-year lifespan. Structal-Bridges is proud to be part of this project."

FIGURE 2: LONGITUDINAL RIBS BEFORE THEIR ASSEMBLY ON THE DECK PLATE

the fabrication is carried out efficiently by a qualified workforce supported by competent professionals.

Assembly of the ribs to the deck plate is performed with an 80 per cent partial joint penetration, one-side submerged arc welding. The success of this challenging step for the fabricator is ensured with a rigorous quality insurance program on the parts dimensions and pre-assembly. Competent welders work with reliable equipment and well-tried welding procedures. For this particular step, Structal-Bridges proposed an alternative method to achieve efficient and rigorous quality control of the partial joint penetration weld. With design engineer's approval, quality control is managed with 100 per cent phased-array ultrasonic testing (PAUT), an advanced inspection method that allows for accurate monitoring of the penetration on the full length of the weld. Quality control of all the other welds is achieved either with ultrasonic testing (UT), magnetic testing (MT) or radiography testing (RT).

Longitudinal inverted Ts and transverse floorbeams are subsequently assembled within the panel. Welds are carefully executed at the intersection of the structural components. Based on the AASHTO code, some standard practices of the industry in Canada have been adjusted to OSD fabrication in order to produce enhanced fatigue-resistant weld details. Structal-Bridges proposed adapted details to design engineers and good communications between the stakeholders of the projects led to rapid acceptation of the proposed details.

A thin layer of polyurethane-based wearing surface is shop-applied on the orthotropic panels. Bimagrip LS, a product of RS Clare & Co Ltd, was picked for the project. While the standard bridge design of Alberta would have a dead load of 7.3 kPa, the OSD/Bimagrip solution will weigh 2.9 kPa, representing only 40 per cent of the standard bridge design dead load. RS Clare offered a 10-year warranty on its wearing surface, ensuring a long-term high-quality product to the bridge owner.

FIGURE 3: WELDING OF THE TRANSVERSE COMPONENTS OF AN ORTHOTROPIC PANEL

On-site installation

On-site operations are scheduled from June to October 2014, including the removal of the existing deck, replacement of the bearings, repairs of the abutments, surface preparation of the main girders and installation of OSD panels. The construction sequences have been staged so that the bridge remains open to a single lane of traffic at all times in order to minimize traffic disruption during the rehabilitation.

In conclusion, bridge owners have a growing interest in OSD construction, especially because of the tremendous potential related to this cost-effective and rapid bridge rehabilitation solution. Structal-Bridges has the expertise to work with bridge owners and engineering firms to develop adapted bridge solutions for a wide range of applications, either for rehabilitation or new construction. The rehabilitation of the three-span bridge over Red Willow River has provided an opportunity to confirm the reliability of orthotropic steel deck projects and to promote the innovative use of a product that is already well known worldwide in the steel industry for design and construction of bridges. The industry and Structal-Bridges are proud to have contributed to the success of this project by providing an innovative solution adapted to client and road user needs.

The fabrication perspective:

The 70-metre-long Red Willow River Bridge consists of three spans supported by four existing steel girders. Its rehabilitation involves the fabrication, delivery and installation of eight orthotropic deck panels of 72 m² each, for a total steel weight of 168 metric tons. Shop-applied thin wearing surface contributes to a lightweight solution and reduces onsite work as well as traffic disruption.

The owner perspective:

The existing reinforced concrete bridge deck on the Red Willow River Bridge was experiencing regular failures and was in urgent need of replacement. Alberta Transportation wanted a wider deck to match the width of the adjoining roadways and a thicker concrete deck to improve its capacity and durability. Preliminary investigations found that the existing girders and substructure were already at or very near their load carrying capacity and would not support a wider, thicker concrete deck without strengthening. An orthotropic steel deck proved to be the ideal solution, providing a lightweight, full-width deck that not only reduced the dead load of the structure, but increased the load-carrying capacity of the girders.

Structural analysis and technical considerations

Loads absorbed by the deck:

The dead weight is absorbed by the deck without composite action, given the presence of the weight before bolting the orthotropic deck. The live loads coming from road traffic loads are absorbed by the deck in composite action.

Modelling:

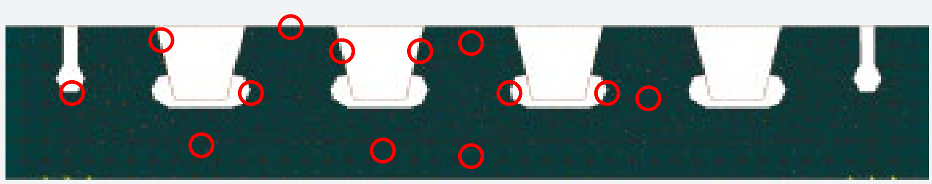
The deck was modelled by a trellis, including all the longitudinal and cross members, the troughs and the upper deck plate. Two-dimensional plate elements were used to simulate bidirectional action during the passage of truck wheels. Finally, a more specific finite element analysis was performed for the details and the more critical and fatigue-sensitive elements.

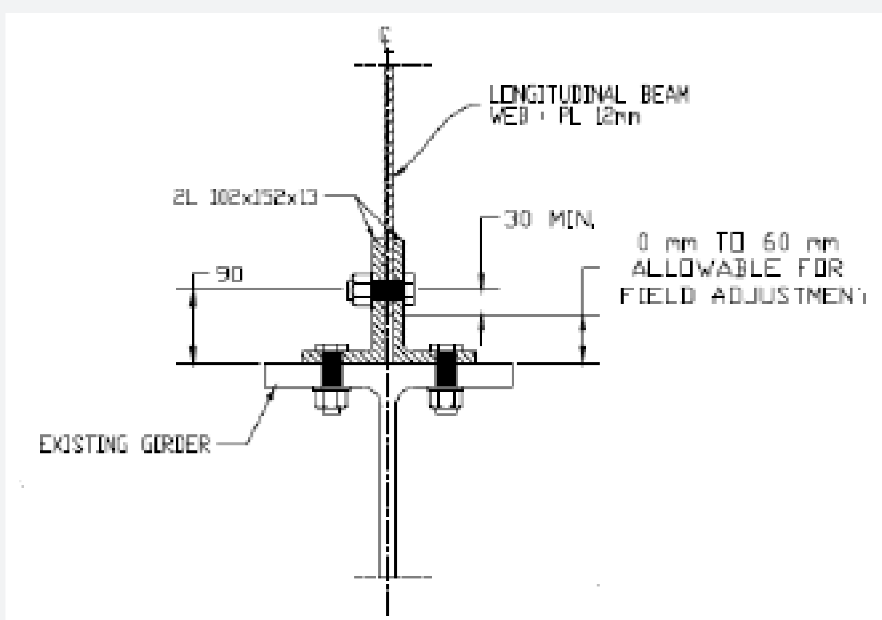
Design characteristics:

Life cycle for fatigue analysis purposes – 25 years. The fatigue analysis of an orthotropic deck is critical, especially at the junction of the troughs with the cross members. As indicated below, 14 critical locations were analyzed more attentively.

Field adjustment details:

Since a vertical field adjustment is required to ensure the assembly of the orthotropic deck with the existing longitudinal beams, a system of adjustable angle brackets was developed instead of the traditional inverted T-beam. See the figure below.





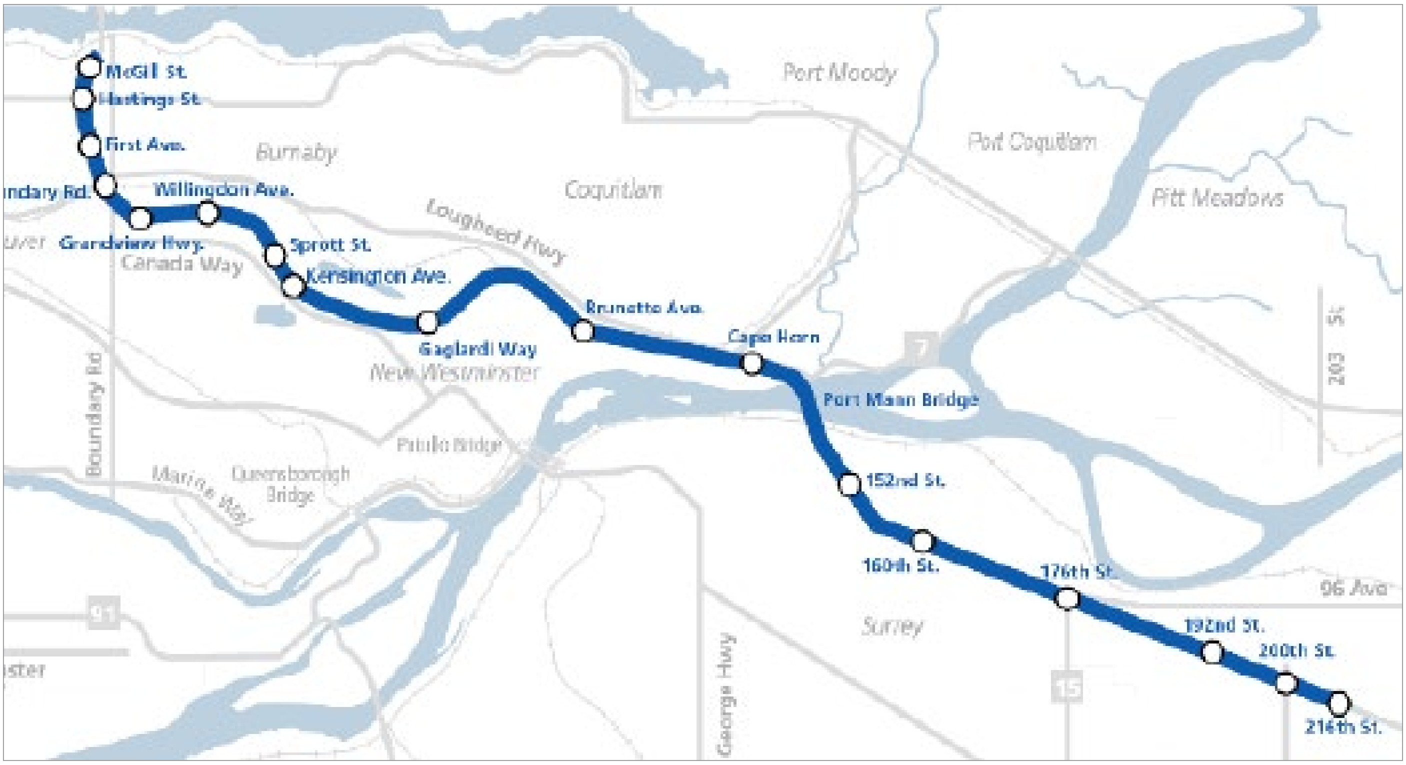


FIGURE 1: PORT MANN BRIDGE HWY 1 PROJECT LAYOUT

Expanding a Vancouver centrepiece

The Port Mann Cable-Stayed Bridge into Vancouver is widened to 10 lanes as part of the province's Gateway Program

By David Goodyear, P.Eng.

The Port Mann Bridge Highway 1 project was tendered in 2007 as part of the Gateway Program in Vancouver, B.C. The project was part of the B.C. government's program to upgrade the transportation network in the Vancouver Region in order to ease congestion on Hwy 1.

The scope of the project included upgrading approximately 37 kilometres of highway, including the existing bridge crossing of the Fraser River (Figure 1). The project called for doubling the capacity over the river, expanding the five-lane facility to 10 lanes.

The project: The new Port Mann Bridge is the centerpiece of, and the tollgate for, the major redevelopment of Highway 1 crossing the Fraser River into Vancouver. The scope and complexity of the project make it one of the most ambitious highway transportation projects in North America. The form of delivery makes it even more impressive in that the entire development was tendered as a private concession. The instructions to proposers called for a privately financed development with a 40-year concession that included the time of construction. The Request for Proposals (RFP) for this massive project included 28 schedules covering every aspect of procurement, design, construction and operations, setting forth the terms and processes for a comprehensive development program.

Selection of the preferred proponent was based on submission of the best net present value (NPV) of the annual concession payments proposed for the development among those who submitted a compliant technical proposal. The Connect BC Team, led by Macquarie as concessionaire, with Kiewit Flatiron General Partnership (KF) as the DB contractor, and with TY Lin International leading the Fraser Crossing design and Hatch Mott McDonald-MMM (H5M) leading the on-shore design, was selected as the preferred proponent.

In the time between selection of the preferred proponent and financial close for the project, the financial markets retracted to the point where the financial plan tendered for the project was in jeopardy. The B.C. government stepped in to address the financial crisis by having the corporation TICorp assume the role of concessionaire. The project then advanced to closing, and a contract was signed with the design-builder KF in March, 2009.

Project development: For the Fraser River Bridge, the Reference Concept called for upgrading the existing bridge, and building an adjacent five-lane cable-stayed bridge to provide the required 10 traffic lanes. The original Port Mann Bridge was a record-setting 366m main span deck tied arch, with the balance of the two-kilometre crossing comprised of plate girder approaches. The old bridge had to stay in service throughout construction of the new facility.

Bridge type studies: Evaluation of alternatives for the new Port Mann Bridge was led by the KF team with the goal of developing the best net present value alternative for the project. The RFP included a number of restrictions on alignments and pier locations, most notably that one could not have a pier on the south bank of the Fraser River, adjacent to the pier already on the south bank for the old bridge. With the 470-metre main span then needing to cross the CN rail yard on the south, the focus quickly moved to cable-stayed alternatives.

The initial screening study of alternatives focused on the Reference Concept for keeping the old bridge and constructing a new five-lane structure. The assessment of maintenance and financial risk associated with extending the old bridge for another 40 years trended towards the merit of a total replacement.

There were two choices for fitting 10 new lanes in a five-lane corridor. One was to develop a double deck solution with an over-under five-lane arrangement. The second was to develop a single level, very wide deck system to carry all 10 lanes. While the double deck configuration itself was not difficult, the transition from a double deck to a single deck approach would be quite expensive. In the case of the Port Mann site, the roadway braid needed for the approach bridge to the southern side required significant extension of the bridge, expensive substructure and complex geometrics for the roadway and approach. A single, central pylon section was developed in order to have tower foundations fall within the Reference Concept right-of-way and allow construction to advance adjacent to the operating bridge (Figure 2). A steel superstructure was ideal for this span and configuration, since deck weight for a composite steel section is considerably less than for a concrete alternative.

The single central pylon concept would support both a two-stay plane full width section and a twin deck four-stay plane section as steel or steel composite deck sections. Sections were developed for both full width steel truss, floorbeam or box section and for a twin composite edge girder section. The steel quantity for a two-cable plane system was approximately 35 per cent greater than for a four-plane system due to the longer floorbeam span. Each of the twin composite frame sections was fairly conventional, and similar to many single four and six lane cable-stayed deck structures built in North America (Figure 3).

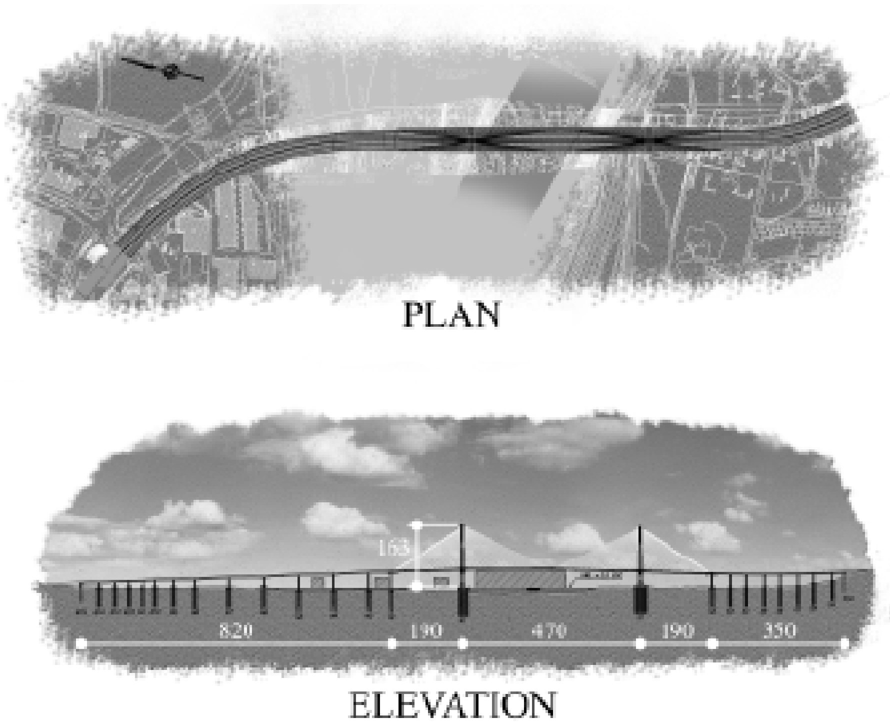


FIGURE 2: NEW PORT MANN BRIDGE LAYOUT

Details of design

The framing system: Each of the two deck frames was a standard floorbeam and edge girder system. However, there were several non-standard aspects of the framing layout associated with the central tower.

1. The constraints of the layout described for the type selection included an atypical span layout. While the railroad yard affected the main span layout, the back spans were constrained by the definition of a secondary navigation channel on the north. The resulting backspan ratio was .4 of the main span, which is less than optimum for girder and anchor pier design on a highway bridge, requiring a large tie-down detail for the anchor piers.

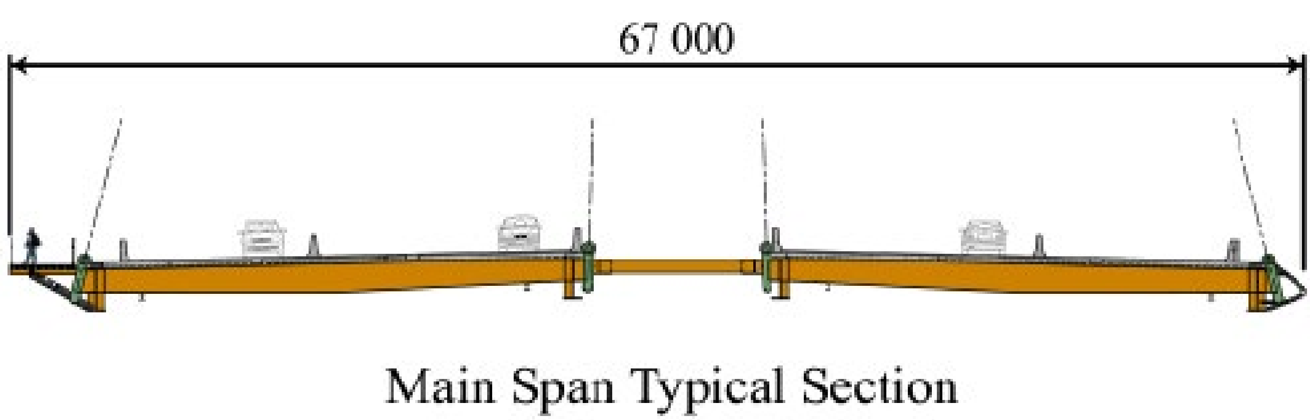


FIGURE 3: MAINSPAN COMPOSITE DECK SECTION

Port Mann Bridge main span

Canron Western Constructors LP live up to the challenges

Canron Western Constructors LP was awarded the supply of the main span structural steel for the new Port Mann Bridge in 2009. This new bridge Is a balanced cantilever scheme, which means that the erection started at both the south and north towers. Panels were added alternating from one side to the other until the two fronts met in the mid span over the river.

Canron also supplied the sidewalk framing, wind fairings, damper, restraint and tie-down units. The fabrication supply represents over 240,000 shop hours that were shared between the Annacis, Delta and Portland plants.

Each of the 272 cable stay anchor units is slightly different than the other based on the fact that the bridge has camber, and the slopes are different from the north and south and side to side. They are an extremely complex component of the bridge requiring stringent geometry controls as well as complicated welding conditions.

One of the other major challenges on this project was the fabrication of the eight heavy edge girders that sit on the abutments. These girders are 24 metres long, very complicated and weigh 110 tonnes. The ends of these girders are fracture critical, and to weld the thick flanges, web collars and stiffeners required a very elaborate preheat system to be used to control the duration of cool down. The welding (around the clock) and testing to the American 01.5 code were a challenge to the shop tradespeople.

Quantities:

Main edge girders (four across): 252

Floor beams: 394

Cable stay anchors: 272

Median struts: 62

Top flange bracing: 432

Temporary bracing: 780

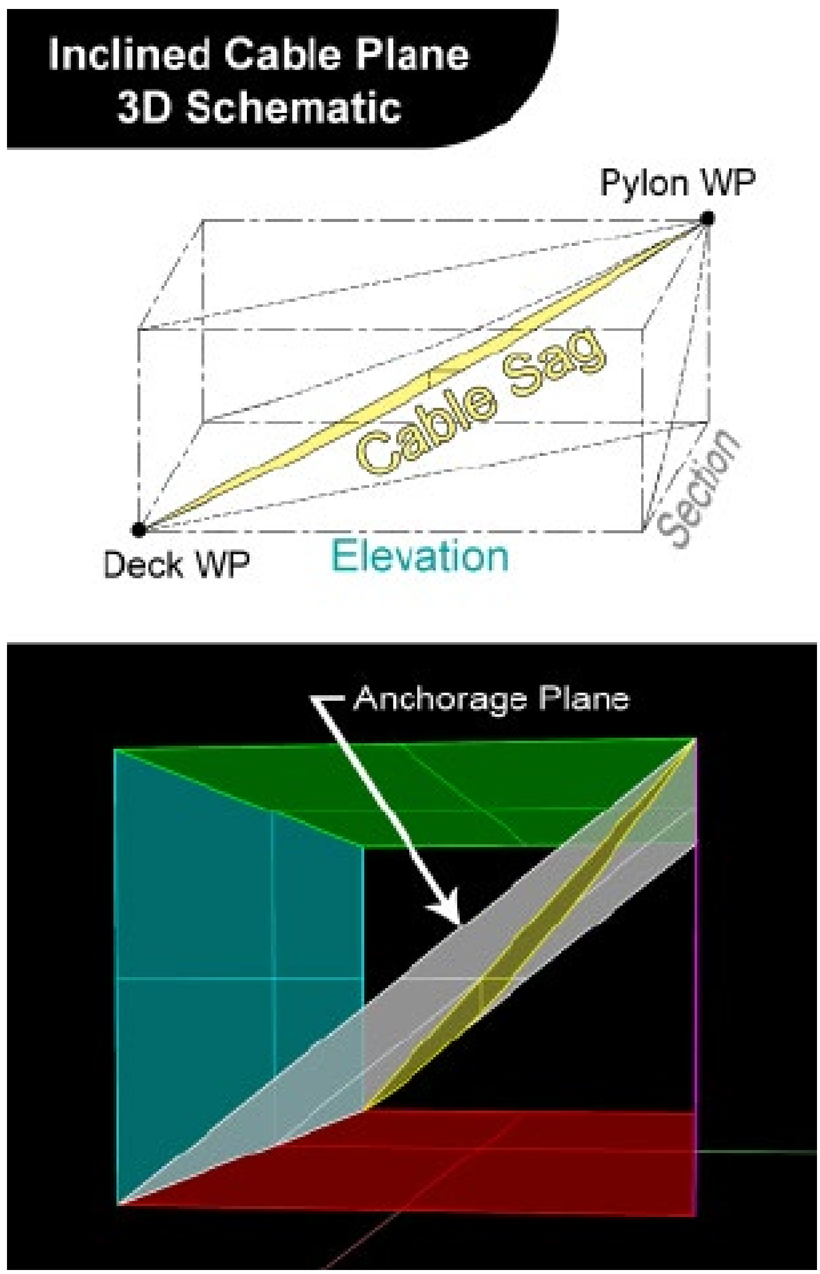


FIGURE 4: INCLINED CABLE PLANE

2. The offset of deck relative to the tower resulted in splayed cables emanating from the single towerhead. The frame included struts between each deck to balance the resulting horizontal cable force across the width of the bridge.

3. In order to allow lanes from the main spans to meet an economical 3-box frame in the approaches, the backspan frames were tapered towards each other. This was only practical with the central pylon scheme.

4. The width of the single central tower was limited by the available right-of-way at the south pylon, and would affect the cost of framing across the inter-roadway gap. The narrow section had limited lateral strength as a freestanding pylon. So the lateral system was also designed as a stayed system, with transverse stabilizer stays connecting the base of the towerhead to stabilizer beams emanating from the tower. The resulting stay system created a cable-stayed pylon that was similar in concept to a sailboat mast, allowing a slender pylon section to work as a pure column instead of the more typical bending mode of a portal frame.

5. The truck clearance required a taller tower for minimum roadway clearance to the stay plane. The tower height was increased approximately 12 metres for this condition.

Deck cable anchors: Deck anchorages for composite steel cable-stayed bridges generally follow one of two forms – fin anchors above deck (extensions of the edge girder web) or bucket anchors below deck (attachments to the side of the edge girder). For the more typical framing systems, these deck anchors are both regular in geometric configuration, and either vertical or only slightly splayed against the vertical frame. The wider offset associated with the four-plane, 10-lane structure resulted in both irregular geometry and considerable lateral cable angles for deck anchorages.

We investigated three basic configurations for these deck anchors. These were:

1. Fin anchors with bent web plates above the deck;

2. Fin anchors with canted edge girder geometry; and

3. Bucket anchors with bolted anchorage assemblies.

FIGURE 6: GENERAL ERECTION LAYOUT

One aspect of splayed stay geometry is that the lateral cable angle of the stay plane is not in the vertical plane (Figure 4). Cable sag, and change in cable sag with changing stay force and vibration, follows the vertical plane. For the typical roadway geometry, the difference in these angles from vertical is slight. But as the offset gets larger, so does the lateral component associated with the difference in vertical cable sag vs. lateral stay plane angle. These conditions affect anchor stiffness, damper performance, fabrication and inspection requirements (Figure 5). The bucket anchor configuration was selected for its superior out-of-plane stiffness and associated damper performance.

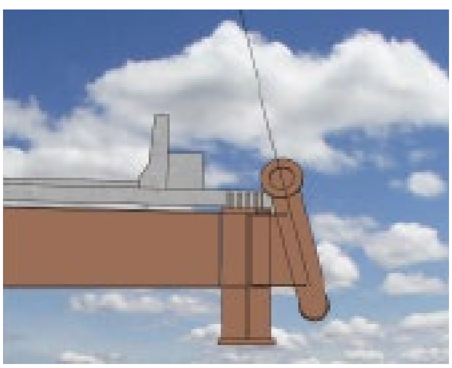


FIGURE 5: BUCKET ANCHOR

Steel erection

For those who like variety, the erection planning program was an ideal assignment. And with two major bridge contractors on the same team, there was no shortage of experience and ideas for erection.

The south cantilever had to deal with limited access over the railroad and over-water erection for the main span, but had an open field for erection of the south backspan. The north cantilever was all over water. The logistics of the south backspan required that erection be fed from outside the railroad yard. So direct lifting by derrick in the standard fashion was not practical. In addition, the heavy weight of the

FIGURE 7: NEW PORT MANN CABLE-STAYED BRIDGE

first field section at each backspan pier was more than a typical deck mounted derrick would handle. The over-water access for the north cantilever permitted lifting a fully assembled steel section. Three separate erection methods were adapted for steel erection. In addition to the gantries used for the north cantilever, derricks were used for stick erection of the south main span, with crane erection for the south backspan (Figure 6).

The more challenging control for steel frame erection is generally the lateral drift, since typically there is nothing in the permanent frame to adjust alignment. That challenge was amplified for the twin barrel deck system on Port Mann. In order to avoid sidesway, the two deck frames had to be erected in parallel. Should they get out of line, there would be a time consuming and challenging process to pull two decks back in line at the same time if drifts differed between the two. So, as we started erection, the number one objective was to hold alignment throughout assembly. The erection crew's diligence paid off, for the alignment during erection was better than any we have seen on even simpler bridges.

In summary, the Port Mann Highway 1 development project was tendered on the basis of a best value defined as the lowest net present value cost over the operating period for technically compliant alternatives. The project development by the successful proponent led to a twin roadway steel composite cable-stayed bridge solution based on the economic advantages in cost, schedule and maintenance, which, when blended with operating factors, produced the lowest net present value offering to the owner (Figure 7).

Credits:

OWNER: Transportation Improvement Corporation, a B.C. Crown Corporation

ORIGINAL CONCESSIONAIRE FOR TENDER: Macquarie Infrastructure

DESIGN-BUILDER: Kiewit Flatiron General Partnership

HIGHWAY AND CIVIL DESIGN: H5M, a joint venture of Hatch Mott McDonald and Marshall Macklin Monaghan

BRIDGE DESIGN: T.Y. Lin International in collaboration with International Bridge Technologies

STEEL FABRICATION AND SUPPLY: Canron Western Constructors, Vancouver B.C.; Oregon Iron Works, Clackamas, OR

News and Events

Continuing Education Courses

CISC is pleased to present a new English-language course in the fall of 2014 and a new French-language course in the winter of 2015 that leads to CISC Accreditation as a Steel Inspector – Buildings.

CISC has begun to offer self-paced, online education using previously recorded material packaged with tutoring and examinations where applicable. Please watch the Education pages on the CISC website for the following courses and webinars: Handbook of Steel Construction, Statics and Strength of Materials, Connections I, Connections II, AESS Series and Fire Protection.

For the full course schedule, information, online registration and the latest updates, please visit our website at www.cisc-icca.ca/courses, or request a copy of our course calendar.

Building with Steel: Critical Stuff you Need to Know!
– New Course –

A course on steel building construction that will provide an overall, non-technical understanding of the structural design and engineering process; manufacturing approvals; applicable building codes and standards; roles and responsibilities; performance; critical aspects of drawings, specifications, design, details and the many manufacturing/fabrication engineering and construction documents; standard of practice; plans review; general review and inspection. The course leader will review regulatory requirements in the building code and referenced standards related to steel construction, as well as the performance of duties by certified and licensed professionals, manufacturers, fabricators, erectors and building code officials. Experiences and lessons presented are based in part on an understanding of forensic engineering incorporating actual investigations (including many interviews with industry).

The course will also touch upon the steps involved in an investigation and evaluation in issues of design, manufacturing, fabrication, erection and inspection. As the industry and projects tend to be litigation orientated and are in constant dispute, the course will incorporate a roundtable discussion and summary of the above and assessment of responsibility, risk management, and recommendations avoidance of issues.

Of interest to chief building officials, building inspectors, plans reviewers, architects, engineers, field inspectors, building envelope consultants, fabricators, erectors, project managers, general contractors and owners.

Course Leader:
Joseph (Joe) S. Vidican, P.Eng., Principal, Vidican Engineering (Building Science & Forensic Engineering)

Toronto, ON	Oct. 16	Saskatoon, SK	Nov. 11
Montreal, QC (E)	Oct. 22	Calgary, AB	Nov. 12
Halifax, NS	Oct. 23	Edmonton, AB	Nov. 13
Fredericton, NB	Oct. 24	Vancouver, BC	Nov. 14
Winnipeg, MB	Nov. 10		

Connections for Design Engineers

This course is intended to provide practical guidance to steel designers and clarify the complementary roles of the fabricator and the design engineer with respect to connection design. Emphasis is placed on connections and their impact on costs and economy.

The basic objective is to assist designers in their understanding of how connections influence member design and vice versa, and to emphasize the importance of considering both connections and member selection for optimum economy. The scope of the course is limited to connections normally encountered in common types of steel building structures.

The presenters will highlight major changes in S16-09 that influence the design of structural steel connections. Topics include high strength bolts, welds, bolts in tension and prying, slip-critical connections, welds and bolts in combination, eccentric connections, simple shear connections, seated beam connections, connection to concrete, column connections, moment connections (W & HSS Sections), bracing connections, gusset plates and truss connections.

Course Leaders:
John R. Mark, M.Sc., P.Eng., Past President, M&G Steel Ltd
Peter C. Birkemoe, Ph.D., P.Eng., Professor Emeritus, University of Toronto

Halifax, NS	Sept. 16	Calgary, AB	Sept. 18
Ottawa, ON	Sept. 17	Vancouver, BC	Sept. 19

Industrial Building Design

This course is intended to provide understanding on design theory and the rationale behind code provisions that are unique to steel-framed industrial buildings. It focuses on practical and economical solutions for framing a typical industrial building to the requirements of the 2010 National Building Code of Canada and the pertinent provisions of CSA Standard S16-09.

The learning goals for this course include the following: identify the unique environmental and mechanical loading conditions in industrial buildings, learn the applicability and limitations of current codes and standards in Canada, select the most cost effective framing schemes, design crane-supporting girders, stepped columns, purlins and girts, explore lateral force resisting systems, roof trusses and efficient connections, understand serviceability considerations and limitations, design for high and low temperatures, learn the implications of seismic provisions, plus other topics such as fatigue, standing seam roofs, rehabilitation, tolerances and coatings.

Course Leaders:
Robert A. (Bob) MacCrimmon, P.Eng., Senior Civil/Structural Specialist, Hatch
Logan Callele, M.Sc., P.Eng., Engineering Manager, Waiward Steel Fabricators

Toronto, ON	September 23
Saskatoon, SK	September 24
Calgary, AB	September 25

Single Storey Building Design
– New Online Course –

This course 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.

Practical steel framing concepts and integration with architectural and mechanical features will be discussed. The presenters will highlight major changes in NBCC 2010 and CSA S16-09.

Topics include ponding of rainwater, snow drifting, companion load combinations, wind and seismic loads, notional loads, P-delta effects, selection of deck and joist systems, design of Gerber girders, design of interior and exterior columns, girts, base plates and anchor rods, selection and design of braced frames and roof diaphragm, fire protection issues, steel fabrication considerations, material selection and economics.

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

Webinar Format (4@2hrs)

Nov. 5-6, 12:00 - 2:00 p.m. and 3:00 - 5:00 p.m. ET

Inspection of Steel Building Structures
– Accreditation Program –

This 3½-day course will prepare inspectors, designers, building officials, fabricators, erectors and other specialists for the inspection of steel-framed buildings in the field. A course participant who achieves an 80 per cent grade on the optional three-hour final exam on the final day will be designated by CISC as an Accredited Steel Inspector - Buildings.

Applicable sections of the National Building Code of Canada, CSA S16 plus referenced material, product and quality standards, CISC Code of Practice and CISC Certification guidelines will be addressed. Typical structural, erection and shop drawings for steel-framed buildings will be explained. Material identification, tolerances, bolting and welding processes and procedures will be reviewed. Included are OWSJ, floor and roof deck, shear studs, surface preparation and coatings.

Course Leader:
Robert E. Shaw, Jr., PE, President, Steel Structures Technology Center, Inc.

Toronto, ON - 1:00 p.m., Oct. 6 to 12:00 p.m., Oct. 10

Inspection des structures de bâtiments en acier
- Nouveau cours : Programme d'accréditation -

Ce cours de 3 ½ jours préparera inspecteurs, concepteurs, agents du bâtiment, fabricants, monteurs et autres spécialistes à inspecter sur le terrain des bâtiments à charpente métallique. Un participant qui obtient une note de 80% à l'exam final facultatif de 3 heures offert la dernière journée sera désigné par l'ICCA comme un inspecteur accrédité – bâtiments en acier.

Les sections applicables du Code national du bâtiment du Canada, la norme CSA S16 ainsi que le matériel référencé, les produits et normes de qualité, le Code pratique standard de l'ICCA et les lignes directrices de certification de l'ICCA seront abordés. Les dessins typiques de structure, de montage et d'atelier pour les bâtiments à charpente d'acier seront expliqués. Les processus et les procédures d'identification du matériel, des tolérances, du boulonnage et le soudage seront examinés. Les poutrelles, le tablier de plancher et de toit, les goujons de cisaillement, la préparation de la surface et des revêtements sont inclus.

Conférenciers: À confirmer

Montréal, QC	Février 2015
Québec, QC	Février 2015

Nouveautés CSA S16-09 et survol du Handbook
– Webinaire –

Ce cours traite des modifications apportées à la norme CSA S16-09 et au dimensionnement des charpentes métalliques à l'aide de la 10e Édition du « Handbook of Steel Construction ».

Ce cours est proposé en ligne, en quatre séances de deux heures, via le système GoToWebinarMC. Les personnes intéressées peuvent s'inscrire aux quatre séances (0,8 UFC/CEU seront accordés à la fin du cours), ou à la séance unique sur la norme CSA S16-09 (0,2 UFC/CEU seront accordés à la fin du cours). De plus, des offres de remise groupées avec le « Handbook » et l'adhésion à l'ICCA seront proposées aux participants lors de l'inscription.

Le cours de formation continue de l'ICCA, Nouveautés CSA S16-09 et survol du « Handbook », est présenté en ligne (webinaire) en quatre séances de deux heures comme suit.

Conférenciers:
Hellen Christodoulou, Ph.D., ing., B.C.L., LL.B., M.B.A., Directrice Régionale-Québec, ICCA
Charles Albert, M.Sc.E., P.Eng., Directeur des publications techniques, ICCA

12 novembre
12 h - 14 h et 15 h - 17 h (HAE)

13 novembre
12 h - 14 h et 15 h - 17 h (HAE)

Conception, fabrication et construction de ponts en acier
Ce cours traite de la conception, de la fabrication et de la construction de ponts en acier selon la norme CAN/CSA-S6-06, Code canadien sur le calcul des ponts routiers, supplément no #1. Ce cours a pour but d'aider à mieux comprendre la théorie de conception et le raisonnement des dispositions du code ainsi que l'application de certaines formules et exigences du Code. Les aspects pratiques et économiques de la fabrication, du montage, du choix des matériaux et leurs conséquences sur la conception seront également mis en évidence.

Conférenciers:
Gilbert Grondin, Ph.D., P. Eng., Senior Bridge Engineer, AECOM & Adjunct Professor, University of Alberta
Jean de Gaspé Lizotte, M.Sc., ing., Directeur, Projets spéciaux, Dessau Soprin inc.
Richard B. Vincent, B.Eng., ing., Vice-président, recherche, Groupe Canam Inc.

Montréal, QC	25 et 26 novembre

EVENTS

SASKATCHEWAN REGIONAL MEETING
Come to our Saskatchewan Regional Meeting on June 25 at the Best Western Royal Inn.

ALBERTA REGIONAL MEETING - BLACKHAWK GOLF CLUB
Alberta has a regional meeting that we would love for you to attend. Come to Blackhawk Golf Club on August 11, and we can play golf after to connect with members and associates.

SASKATCHEWAN GOLF TOURNAMENT
Saksatchewan has a golf tournament on September 12, 2014. Come and play golf with us at Moon Lake Golf and Country Club.

2014 CISC 85TH ANNUAL CONFERENCE & NATIONAL DESIGN AWARDS
Join us for three exciting days of networking and social events, dynamic presentations and a taste of Atlantic hospitality! Reserve your hotel room for October 1 to 3, 2014.

SAVE THE DATE: 6th ANNUAL QUEBEC STEEL WORKSHOP
Quebec Steel Symposium & Trade Show and Quebec Steel Industry Awards of Excellence

The contribution of the steel industry to the world of transport and infrastructure, on October 3, 2014.

New Members and Associates

CISC welcomes the new members and associates approved by the board:

Fabricators
Imperial Metal Industries Inc., Blumenort, MB
Acier Profilé SBB Inc., Terrebonne, QC
Hopkins Steel, Welland, ON

Associate Consultant Companies
DTI Structural Engineers Inc., Tecumseh, ON
SKC Engineering Ltd. (welding engineering), Surrey, B.C.
Pharaoh Engineering Ltd., Medicine Hat, AB
John G. Cooke & Associates Ltd (Consulting engineers), Ottawa, ON
AMEC Americas Limited, Vancouver, B.C.
AMEC Americas Limited, Saskatoon, SK
Protostatix Engineering Consultants, Edmonton, AB

Associate Suppliers
Park Derochie, Edmonton, AB
Aarc-West Industrial Coatings Inc., Surrey, B.C.
Aggressive Tube Bending Inc., Surrey, B.C.
Canadian Quality Inspections Ltd., Winnipeg, MB

Associate Technical Individuals
Firas Shaker, Self-employed, Baghdad University, Civil Engineering, Oakville, ON

Associate Professionals
Frédéric Marquis, P.Eng., OIQ, Pasquin St-Jean & Associés, Montreal,QC
Eric Boudreau, P.Eng, PENB, Senior Civil/Structural Engineer, Rally Engineering, Fredericton, NB
Remo Rinadli, P.Eng., OIQ, Bridge Engineer, Canadian National Railway, Montreal, QC
Brian Waddell, P.Eng, PEO, Structural Engineer, Waddell Engineering Ltd., Cambridge, ON
Bram Toomath, P.Eng, Hannigan Engineering, Vaughan, ON
Joseph Vidican, P.Eng., Vidican Engineering Inc., Belle River, ON
David D. Perry, P.Eng, Civil/Structural Engineer, DMG Consulting Ltd., Gander, NL
Rory A. Smith, P.Eng., Structural Engineer, Stantec, Calgary, AB

Associate Steel Erectors
Ramco Installation Ltd., Stoney Creek, ON
St. Peter Steel Inc., Brampton, ON

Associate Fabricators
Acier Charron Ltée, Boisbriand, QC
Coquitlam Steel Products Ltd., Port Coquitlam, B.C.

2014 Joint Architectural and Engineering Educators' Meeting

The CISC Quebec Region was the host for the 2014 Educators' Conference, which was held from February 28 to March 1 in Quebec City.

This two-day gathering of architectural and engineering professors who teach steel design and construction at Canadian universities has been held biennially since 1985. The goal of the meeting is to renew the educators' enthusiasm for steel construction, provide updates on new trends in the industry, give them an opportunity to network and discuss educational issues, and to set the stage for greater collaboration and sharing of knowledge and resources.

Networking at the 2014 Educators' Meeting in Quebec City

2014 G.J. Jackson Memorial Fellowship Award

The G.J. Jackson Fellowship is awarded annually by the Steel Structures Education Foundation in memory of the late Geoffrey Jackson. Jackson was, for many years, a leader in the Canadian structural steel fabrication industry and was a founding member of the Steel Structures Education Foundation. The award is presented to Canadian engineering students conducting graduate studies in structural engineering, with major emphasis on steel structures. This prestigious award is currently valued at $20,000 over a one-year period. This award is presented at the Annual SSEF – CISC Convention and commemorated with the Geoffrey J. Jackson Memorial Certificate.

The 2014 Jackson Fellowship recipient is François Leprince, a master's candidate who is studying at Université Laval under the supervision of Professor Josée Bastien.

Leprince is conducting research on the "Study of Resistance to Fatigue of High Performance Steel Connections of a Hybrid Girder Bridge in the Canadian Context." The research program will involve experimental tests on welded connections between high performance steel and conventional steel to assess fatigue strength and the viability of hybrid high-performance steel girders.

The Jackson Fellowship will be presented to Leprince this year at the SSEF Annual Conference in St. John's, Newfoundland, on October 3.

Information about the Jackson Fellowship can be found on the SSEF website. (www.ssef-ffca.ca/scholarships/jackson).

2013 SSEF University Research Grants

The SSEF has been actively promoting research of topics that are considered to be of interest and importance to the steel industry since 1995. University research grant applications are reviewed and ranked by the SSEF and, at the discretion of the SSEF, awarded to full-time members of engineering faculties of Canadian universities for a one-year period. The total value of grants awarded for the 2013-2014 academic year is $102,000. The principal researcher of the top-ranked SSEF university research grant applications is also awarded the H. A. Krentz Award.

The 2013-2014 grant recipients and topics include: Dr. Robert Driver (University of Alberta), "Solving the mystery of double-coped beams"; Dr. Anjan Bhowmick (Concordia University), "Behaviour of light-gauge steel shear walls with screwed infill plate connections for regions of low-to-moderate seismicity"; Dr. Dimitrios Lignos (McGill University), "Development of Ry, Rt factors and probable brace resistance axial loads for the seismic design of bracing connections and other members"; Dr. Scott Walbridge and Dr. Jeffrey West (University of Waterloo), "Fatigue behaviour and design of shear connectors in steel-precast composite girders"; and Dr. Tony T.Y. Yang (University of British Columbia), "Development of innovative and cost-effective seismic fuses using wide flange steel sections."

Information about these research topics, as well as those from previous grant years, can be found on the SSEF website.

Suggestions for research topics can be made by completing the "SSEF Research Topic Suggestion Form" found on the SSEF website at www.ssef-ffca.ca/research.

2013 H.A. Krentz Award

The H.A. Krentz Award recognizes a researcher whose research topic has special merit and interest with promise that it will make a significant contribution to understanding the behaviour of steel structures, advances in the economy, safety or reliability of steel structures. A gift of $5,000 is part of this notable award.

Dr. Robert Driver (left) being presented with his award by SSEF Governor Chris Adach (right)

The 2013 H.A. Krentz Award is awarded to Dr. Robert Driver, Professor, Department of Civil and Environmental Engineering at the University of Alberta. The SSEF awarded Dr. Driver a grant of $22,000 for his research on "Solving the mystery of double-coped beams."

Dr. Robert Driver Ph.D., P. Eng., has over 25 years of experience in the steel industry, applied research related to steel structures, structural consulting and engineering education. Dr. Driver's primary research interests pertain to the design and behaviour of steel structures, including topics such as bolted and welded connections, plate walls, high performance steel, rehabilitation, composite columns, and behaviour under extreme loading.

2013 Architectural Student Design Competition

Since it was announced in 2001, the Architectural Student Design Competition has encouraged architectural students to consult with experts, engineers and fabricators to arrive at a true understanding of the structural design and detailing requirements of a steel structure – taking the study of steel beyond the technical and into the realm of supposed application to arrive at a meaningful realization of architectural ideas. Eligibility for this competition is limited to students registered in professional architectural programs in Canada.

Submissions for this competition are examined by a panel of judges that includes an architectural educator, a practicing architect, a consulting structural engineer and a structural steel fabricator. The top three submissions receive awards.

The 2013 competition challenged students to include the theme of "POP-UP" in their designs. Below is the description of "The Challenge," as given in the 2013 competition poster (see also www.ssef-ffca.ca/competitions/ssef/2013):

"In her article *Pop-Up Populism*, on the growing phenomenon of POP-UP architecture, Kelly Chan writes:

> Vitruvius's virtues roughly translate to "utility," "durability," and "beauty." But for centuries now, this association of great architecture with fixed and timeless permanence, along with the entire Vitruvian triad, has been losing traction. Our environment has been built, altered, and rebuilt in overlapping waves. While some buildings stand the test of time, most seem to expire in relevance. Grand architectural and planning schemes are increasingly rare. In fact, we fast-forward to today, and it seems that we are collectively swinging towards a polar opposite of Vitruvian values. We are moving towards an architecture in which the permanent is becoming a lot less permanent.
>
> www.artinfo.com/news/story/802841/pop-up-populism-how-the-temporary-architecture-craze-is-changing-our-relationship-to-the-built-environment

Award of Excellence Winners: Gabriella den Elzen and James Clarke-Hicks

Award of Excellence: "Shape Space" panel by Gabriella den Elzen and James Clarke-Hicks, University of Waterloo

A related movement articulated by New York's Projects for Public Spaces calls for a new set of Vitruvian principles: "Light, Quick and Cheap," as a response to contemporary cities struggling to do more with less, to find creative, innovative and quick ways of addressing urban issues, and to respond to their communities in a meaningful fashion. Projects such as Brooklyn's DeKalb Market, Oakland's Popuhood, San Francisco's parking stall parks, and a multitude of gallery and market installations are manifesting and testing these new principles. Temporary in more than the temporal sense, these designs eschew disposability in favour of changeability: they are responsive to change in use and time. Students are invited to engage in an exploration of POP-UP as an architectural and structural concept. To that end, we encourage students to conceptualize and design a POP-UP architectural installation that incorporates the goals of being: (truly) sustainable; temporary; socially relevant; responsive to site.

While they may range from utilitarian to exquisite in their execution, all responses must come to terms with one simple problem: the clear incorporation of POP-UP in a design that utilizes steel as the primary element for structural form."

Students were supposed to conceptualize, and realize in detail, a structure that explores the theme of "POP-UP" with emphasis on the architectural exploration through form and material and on the essential relationship between architecture and structure. Students were required to include buildable details, primarily using structural steel, and were to collaborate with fabricators on those details.

Award winners

The awards were presented at the SSEF – CISC Annual Convention on September 20, 2013 in Whistler, B.C. The award-winning submissions are featured on the SSEF website (www.ssef-ffca.ca/competitions/ssef/2013).

Award of Excellence

Gabriella den Elzen and James Clarke-Hicks, University of Waterloo

Faculty Sponsors: Terri Meyer Boake & Mark Cichy

Gabriella and James were awarded $3,000 (to share) and the Faculty Sponsors were awarded $1,500 (to share).

Awards of Merit

Ji Shi and Logan Steele, University of Waterloo

Faculty Sponsors: Terri Meyer Boake & Mark Cichy

Ji and Logan were awarded $2,000 (to share) and the Faculty Sponsors were awarded $1,000 (to share).

Gary Luk, Ryerson University

Faculty Sponsor: Vincent Hui

Gary was awarded $2,000 and the Faculty Sponsor was awarded $1,000.

Please visit the SSEF website to view the submissions of the award winners and to also get information about the 2014 SSEF Architectural Design Competition, "Span" (www.ssef-ffca.ca/competitions/ssef).

Common Codes and Standards for Design and Construction of Steel Structures Current Status and Future Publication Targets

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 2010	NBC 2015	Late 2015
NBC Structural Commentaries (Part 4 of Div. B)	NBC 2010 Str. Comm.	NBC 2015 Str. Comm.	2016
CSA S16 Design of Steel Structures	CSA S16-14	TBA	
CISC Commentary on CSA S16 (Part 2 of CISC Handbook of Steel Construction)	CISC Handbook 10th Edition[1]	CISC Handbook 11th Edition[2]	2015
CISC Moment Connections for Seismic Applications	2nd Edition	TBA	
CSA S6 Canadian Highway Bridge Design Code	CSA S6-06	S6-14	Fall 2014
- Supplements to CSA S6	CSA S6S3-13	None planned	
CSA S6.1 Commentary on Canadian Highway Bridge Design Code	CSA S6.1-06	S6.1-14	Fall 2014
- Supplements to CSA S6.1	CSA S6.1S3-13	None planned	
CSA G40.20/G40.21 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel	G40.20-13 G40.21-13	TBA	
CSA W59 Welded Steel Construction (Metal Arc Welding)	CSA W59-13	TBA	
CSA W47.1 Certification of Companies for Fusion Welding of Steel	CSA W47.1-09	W47.1-15	2015
CSA S136 North American Specification for the Design of Cold-Formed Steel Structural Members	CSA S136-12	TBA	
CSA S136.1 Commentary on CSA S136	CSA S136.1-12	TBA	

[1] *CISC Handbook of Steel Construction - 10th Edition includes CSA S16-09, its Commentary, CISC Code of Standard Practice - 7th Edition, and design and detailing aids in accordance with CSA S16-09*
[2] *CISC Handbook of Steel Construction - 11th Edition includes CSA S16-14, its Commentary, CISC Code of Standard Practice - 7th Edition, and design and detailing aids in accordance with CSA S16-14*

Member and Associate list as of June 12, 2014

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

STEEL FABRICATOR ATLANTIC

Canam, a division of Canam Group Inc.
Moncton, NB 506-857-3164
www.canam-construction.com

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

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

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

MacDougall Steel Erectors Inc.
Cornwall, PE 902-855-2100
www.macdougallsteel.com

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

Modular Fabrication Inc. 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. Br, P, S
Saint John, NB 506-632-2600
www.oceansteel.com

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

Ready Arc Welding (2000) Inc. B, Br, P, S
Saint John, NB 506-696-8336
www.readyarc.ca

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

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

QUEBEC

Acier Fortin Inc. S
Montmagny, QC 418-248-7904
www.acierfortin.com

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

Acier Profilé SBB Inc. B, Br, J
Terrbonne, QC 450-968-0800
www.sbb.ca

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

Alma Soudure inc. S
Alma, QC 418-669-0330
www.almasoudure.com

Canam, a division of Canam Group Inc. J, S
Saint-Gédéon, QC 418-582-3331
www.canam.ws

Canam, a division of Canam Group Inc. J, S
St-Georges, QC 418-228-8031
www.canam.ws

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

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

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

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

Les Constructions Beauce-Atlas inc. Br, S
Ste-Marie de Beauce, QC 418-387-4872
www.beauceatlas.ca

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 GB 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
Donnaconna, 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.pmibuilding.com

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

Ray Metal Joliette Ltée S
Joliette, QC 450-753-4228

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

Structal-Heavy Steel Construction, a division of Canam Group Inc. J, S
Boucherville, QC 450-641-4000
www.structalstructure.com

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

A.J. Braun Mfg. Limited Br
Kitchener, ON 519-745-5812
www.ajbraun.com

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

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

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

Azimuth Three Enterprises Inc. S
Brampton, ON 905-793-7793
www.az3.com

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

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

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

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

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

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

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

Cooksville Steel Limited [Mississauga] 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

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

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

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

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

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

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

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

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

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

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

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

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

Maple Industries Inc. S
Chatham, ON 519-352-0375
www.mapleindustries.ca

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

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

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

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

Paramount Steel Limited S
Brampton, ON 905-791-1996
www.paramountsteel.com

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

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

Quest Steel Inc. B, Br, P, S
Mississauga, ON 905-564-7446

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

Sandro Steel Fabrication Ltd.
Sudbury, ON 705-522-1305

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

Steelcon Fabrication Inc. B
Bolton, ON 416-798-3343

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

Tower Steel Company Ltd. S
Erin, ON 519-833-7520
www.towersteel.com

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

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

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

MANITOBA

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

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

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

Imperial Metal Industries Inc. B, S
Blumenort, MB 204-326-6683
www.imperialmetal.ca

Omega Joists Inc. J
Calgary, AB 403-250-7871
www.omegajoists.com

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

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

Supreme Steel LP [Winnipeg] B, S
Winnipeg, MB 204-589-7371
www.supremegroup.com

SASKATCHEWAN

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

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

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

Omega Joists Inc. J
Calgary, AB 403-250-7871
www.omegajoists.com

Supreme Group Inc. [Saskatoon] P, S
Saskatoon, SK 306-975-1177
www.supremegroup.com

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

ALBERTA

Anglia Steel Industries (1984) B, P, S
Calgary, AB 403-720-2363
www.angliasteel.ca

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, a division of Canam Group Inc. (Alberta) 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. [Edmonton] J, P, S
Edmonton, AB 780-447-4650
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

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

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

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

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

Omega Joists Inc. J
Calgary, AB 403-250-7871
www.omegajoists.com

Omega Joists Inc. J
Nisku, AB 780-955-3390
www.omegajoists.com

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

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

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

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

Spartan Steel S
Edmonton, AB 780-435-3807

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

Supreme Steel Ltd. [Edmonton] P, S
Edmonton, AB 780-483-3278
www.supremegroup.com

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

Tarpon Energy Services (Structures) Ltd. B, S
Calgary, AB 403-236-9293
www.tarponenergy.com

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

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

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

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

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

BRITISH COLUMBIA

Belair Fabrication Ltd. B, Br, P, S
Delta, BC 604-924-0424
www.belairfabrication.com

Canam, a division of Canam Group Inc. (BC Region) S
Port Moody, BC 604-583-9760
www.canam-construction.com

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

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

ISM Industrial Steel & Manufacturing Inc. B, Br, P, S
Delta, BC 604-940-4769
www.ismbc.ca

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

Omega Joists Inc. J
Calgary, AB 403-250-7871
www.omegajoists.com

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

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

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

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

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

STEEL SERVICE CENTRE OR STEEL WAREHOUSE

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

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

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

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

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

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

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

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

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

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

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

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

Russel Metals Inc. [Winnipeg]
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
Nisku, AB 780-955-4777
www.samuel.com

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

Samuel, Son & Co., Limited
Hamilton, ON 905-573-9100
www.samuel.com

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

Samuel, Son & Co., Limited
Winnipeg, MB 204-985-6600
www.samuel.com

Wilkinson Steel and Metals Inc. (Saskatoon)
Saskatoon, SK 306-652-7151
www.wilkinsonsteel.com

Wilkinson Steel and Metals Inc. [Edmonton]
Edmonton, AB 780-434-8441
www.wilkinsonsteel.com

Wilkinson Steel and Metals Inc. [Vancouver]
Vancouver, BC 604-324-6611
www.wilkinsonsteel.com
Misc. structural shapes, hot rolled bars and plates. Structurals-angles, flats, beams, channel, plate

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

STEEL MILL PRODUCER

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

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

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

STEEL DETAILER

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

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

ABC Drafting Company Ltd. B
Mississauga, ON 905-624-1147
www.abcdrafting.com

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

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

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

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

Automated Steel Detailing Associates B, Br, P
Toronto, ON 416-241-4350
www.asda.ca

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

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

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

Cadmax Detailing Inc. / Dessins Cadmax inc. B, Br
Boisbriand, QC 450-621-5557
www.cadmax.ca

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

GENIFAB Inc. B, Br
Charlesbourg, QC 418-622-1676
www.genifab.com

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

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

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

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

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

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

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

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

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

Lancor Structural Design Ltd. B
Shediac, NB

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

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

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

M & D Drafting Ltd. B, Br, P
Edmonton, AB 780-465-1520
www.mddrafting.com

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

M&D Drafting Ltd. (BC) B, Br, P
Surrey, BC 604-576-8390
www.mddrafting.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

Saturn Detailing Services Ltd. B
Winnipeg, MB 204-663-4649
www.saturndetailing.ca

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

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

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

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

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

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

STEEL AFFILIATES

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

ASSOCIATES

STEEL FABRICATOR

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

AI Industries
Surrey, BC 604-583-2171
www.ai-industries.com

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

Bruce Steel Fabricators Inc.
Edmonton, AB 780-484-2188
www.brucesteel.ca

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

Century Steel Fabrications
Winnipeg, MB 204-233-3300

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

Dynex Mfg Ltd.
Fredericton, NB 506-458-9870

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

George Third & Son
Burnaby, BC 604-639-8300
www.geothird.com

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

Lexitar Solutions Inc.
Devon, AB 780-987-3883
www.lexitar.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

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

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

STEEL ERECTOR

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

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

Island Industries Ltd. B
Edmonton, AB 780-886-9632

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

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

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

Montacier International Inc. B, Br
Boisbriand, QC 450-430-2212
www.montacier.com

Montage D'acier International - division de Louisbourg SBC S.E.C. Br, P
Laval, QC 450-727-5800

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

Ramco Installation Ltd. B, Br
Stoney Creek, ON 905-664-5166

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

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

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

SUPPLIER

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

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

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

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

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

AGT
Trois-Rivières, QC 819-692-0978
www.agtech.qc.ca

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

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

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

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

Blastal Coatings Services Inc.
Brampton , ON 905-459-2001
www.blastal.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

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

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

Coface Canada Collections Corp.
Toronto, ON 647-426-4035
www.coface.ca

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

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

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

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

Daley Metals Ltd.
Brampton, ON 416-407-4620
www.daleymetals.com

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

Dowco Technology Services Ltd.
Surrey, BC 604-606-5811
www.dowcotech.com

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

Edvan Custom Metal Processing Ltd.
Nisku, AB 780-955-7915
www.edvancan.com

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

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

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

Fisher & Ludlow, division d'acier Harris Ltée [Longueuil]
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

General Paint
Vancouver, BC 604-253-3131
www.generalpaint.com
Shop primers, protective coatings, paint

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
Mississauga, ON 905-670-0680
www.ifastgroupe.com

ITW Welding North America
Mississauga, ON 905-267-2171
www.ITWwelding.com

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

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

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

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

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

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

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.
Brampton, ON 905-840-9872
www.moorebrothers.ca

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

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

PPG Protective & Marine Coatings
Concord, ON 905-738-7310
www.ppgpmc.com

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

Prodevco Industries
St-Georges, QC 418-226-4480
www.pcr42.com

Pure Metal Galvanizing, Division of PMT Industries Limited
Rexdale, ON 416-675-3352
www.puremetal.com
Custom "Hot Dip" zinc galvanizing; picking and oiling

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

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

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

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

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

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

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

Transport Hervé Lemieux (1975) Inc.
Verchères, QC 581-998-3841
www.transportlemieux.com

Tri-Krete Coatings Inc.
Bolton, ON 905-857-6601
www.tri-kretecoatings.com
Painting/Protective Coatings, Abrasive Blasting(Sandblasting), Protective Coatings/ Metal Finishing

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

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

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

VICWEST Corporation [Delta]
Delta, BC 604-946-5316
www.vicwest.com
Steel metal floor/roof deck, wall and roof cladding

VICWEST Corporation [Edmonton]
Edmonton, AB 780-454-4477
www.vicwest.com
Steel metal floor/roof deck, wall and roof cladding

VICWEST Corporation [Moncton]
Memramcook, NB 506-758-8181
www.vicwest.com
Steel metal floor/roof deck, wall and roof cladding

VICWEST Corporation [Oakville]
Oakville, ON 905-825-2252
www.vicwest.com

VICWEST Corporation [Winnipeg]
Winnipeg, MB 204-669-9500
www.vicwest.com
Steel metal floor/roof deck, wall and roof cladding

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

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

Waxman Industrial Services Corp.
Burlington, ON 866-294-1699
www.waxmanindustrial.ca

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

BUILDER OR STAKEHOLDER

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

Ontario Erectors Association
Collingwood, ON 705-445-9415

NORTH AMERICAN 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

CONSULTANT COMPANY

Adjeleian Allen Rubeli Ltd., Ottawa, ON	613-232-5786
Aecom, Whitby, ON	905-668-9363
AECOM, Québec, QC	418-648-9512
Aecom Consultants Inc., Montréal, QC	514-287-8500
AMEC Americas Limited, Trail, BC	250-368-2407
AMEC Americas Limited, Vancouver, BC	604-664-5920
AMEC Americas Limited, Saskatoon, SK	306-477-1155
AMEC Americas Limited, Dartmouth, NS	902-420-8924
Architecture Open Form, Montréal, QC	514-490-0202
Arcon Engineering Consult. Ltd., Willowdale, ON	416-491-2525
ARUP, Toronto, ON	416-515-0915
Associated Engineering (B.C.) Ltd., Burnaby, BC	604-293-1411
Axys Consultants inc., Sainte-Marie de Beauce, QC	418-387-7739
Bantrel, Calgary, AB	780-462-5000
BAR Engineering Co. Ltd., Lloydminster, AB	780-875-1683
Blackwell Bowick Partnership Ltd., Toronto, ON	416-593-5300
BMR Structural Engineering, Halifax, NS	902-429-3321
BPR Bâtiment inc., Québec, QC	418-871-8151
BPTEC Engineering Ltd., Edmonton, AB	780-436-5376
Brenik Engineering Inc., Concord, ON	905-660-7732
Bureau d'études spécialisées inc., Montréal, QC	514-393-1500
Byrne Engineering Inc., Burlington, ON	905-632-8044
Calculatec Inc., Montréal, QC	514-525-2655
CBCL Limited, Halifax, NS	506-450-9441
CH2M Hill Canada Limited, Calgary, AB	416-499-0090
CIMA+, Québec, QC	418-623-3373
CIMA+ Partenaire de génie, Laval, QC	514-337-2462
CPE Structural Consultants Ltd., Toronto, ON	416-447-8555
CWMM Consulting Engineers Ltd., Vancouver, BC	604-868-2308
D'Aronco, Pineau, Hébert, Varin, Laval, QC	450-969-2250
Delcan Corporation, Ottawa, ON	905-943-0500
Dessau Inc., Montréal, QC	514-281-1033
Dessau inc., Gatineau, QC	819-777-2727
Dialog, Edmonton, AB	780-429-1580
Dorlan Engineering Consultants Inc., Mississauga, ON	905-671-4377
DTI Structural Engineers Inc., Toronto, ON	519-979-3858
ECO-Technica, Edmonton, AB	780-440-0400
Engineering Link Inc., Toronto, ON	416-599-5465

Entuitive, Toronto, ON	416-477-5832
exp, Markham, ON	905-695-3217
exp, Hamilton, ON	905-525-6069
Experts-Conseils CEP inc., Laval, QC	418-622-4480
Fluor Canada Ltd., Calgary, AB	403-537-4000
Gauthier Consultants, Longueuil, QC	450-674-5548
Gerrits Engineering, Barrie, ON	705-737-3303
Glotman Simpson Consulting Engineers, Vancouver, BC	604-734-8822
Golder Associates Ltd., Mississauga, ON	905-567-4444
Groupe-conseil Structura international, Montréal, QC	514-978-6395
Haddad, Morgan and Associates Ltd., Windsor, ON	519-973-1177
Halsall Associates, Toronto, ON	416-487-5256
Harbourside Engineering Consultants, Darmouth, NS	902-405-4696
Hastings & Aziz Limited, Consulting Engineers, London, ON	519-439-0161
Hatch, Mississauga, ON	902-421-1065
Hatch, Saskatoon, SK	306-657-7500
Herold Engineering Limited, Nanaimo, BC	250-751-8558
HILCON Limited, Fredericton, NB	506-454-4455
IBI Group, Etobicoke, ON	416-679-1930
IRC McCavour Engineering Group Inc., Mississauga, ON	905-607-7244
Isherwood Associates, Mississauga, ON	905-820-3480
J.L. Richards & Associates Ltd., Ottawa, ON	613-728-3571
Jacobs Canada Inc. , Edmonton, AB	780-732-7837
JADE Engineers Inc., Tillsonburg, ON	519-842-9500
JML Engineering, Thunder Bay, ON	807-345-1131
John G. Cooke & Associates Ltd., Ottawa, ON	613-226-8718
K D Ketchen & Associates Ltd., Kelowna, BC	250-769-9335
Klohn Crippen Berger Ltd., Vancouver, BC	604-251-8429
Konsolidated Structural, Toronto, ON	416-762-3224
Kova Engineering (Saskatchewan) Ltd., Saskatoon, SK	306-652-9229
Krahn Engineering Ltd., Abbotsford, BC	604-853-8831
Leekor Engineering Inc., Ottawa, ON	613-234-0886
Les Conseillers BCA Consultants Inc., Montreal, QC	514-341-0118
Les Services exp inc., Drummondville, QC	819-478-8191
March Consulting Associates Inc, Saskatoon, SK	306-651-6400
MMM Group Limited, Thornhill , ON	905-882-4211
Morrison Hershfield Ltd., North York, ON	416-499-3110
MPa GROUPE CONSEIL INC., Carignan, QC	450-447-4537
MTE Consultants , Burlington, ON	905-639-5555
N.A. Engineering Associates Inc., Stratford, ON	519-273-3205
Nouvelle Autoroute 30 S.E.N.C., Sainte-Anne-de-Bellevue, QC	514-457-1998
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
Quinn Dressel Associates, Toronto, ON	416-961-8294
R.J. Burnside & Associates Limited, Collingwood, ON	705-446-0515

Read Jones Christoffersen Ltd., Toronto, ON	416-977-5335
Read Jones Christoffersen Ltd., Vancouver, BC	604-738-0048
Read Jones Christoffersen Ltd., Victoria, BC	250-386-7794
Read Jones Christoffersen Ltd., Edmonton, AB	780-452-2325
Ridgeline Engineering, Calgary, AB	403-984-4944
Robb Kullman Engineering Ltd., Saskatoon, SK	306-477-0655
Roche ltee, Groupe-Conseil, Quebec, QC	418-654-9600
Roy Consultants, Bathurst, NB	506-546-4484
Schorn Consultants Ltd., Waterloo, ON	519-884-4840
SDK et Associés, Montréal, QC	514-938-5995
Siefken Engineering Ltd., New Westminster, BC	604-525-4122
SKC Engineering Ltd., Surrey, BC	604-882-1889
SNC Lavalin, Toronto, ON	514-393-8000
SNC Lavalin Inc. (Montréal), Montréal, QC	514-393-1000
Stantec Consulting Ltd., Mississauga, ON	905-858-4424
Steenhof Building Services Group, Orillia, ON	705-325-5400
Stephenson Engineering Ltd., Toronto, ON	416-635-9970
Teletek Structures Inc., Waterloo, ON	519-954-8714
The Walter Fedy Partnership, Kitchener, ON	519-576-2150
UMA Engineering Ltd., Mississauga, ON	514-940-6862
Valron Structural Engineers - Steel Detailers, Moncton, NB	506-856-9601
Weiler Smith Bowers, Burnaby, BC	604-294-3753
Wood Group PSN, St. John's, NL	709-778-4000
Worley Parsons Canada, Burnaby, BC	780-577-5635
Worley Parsons Canada, Edmonton, AB	780-577-5635
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. (Ottawa), Ottawa, ON	613-829 2800
WSP Canada Inc. (Sherwood Park), Sherwood Park, AB	780-410-6814
WSP Canada Inc. (Victoria), Victoria, BC	250-384-5510
Yolles, A CH2M HILL Company, Toronto, ON	416-363-8123

PROFESSIONAL - INDIVIDUAL

Vitomir, M Acimovic, Montréal, QC	514-940-9511
Ahmad Afshin, Longueuil, QC	450-670-4222
Mehrdad Ahmadi, Langley, BC	604-888-1968
William J. Alcock, North Vancouver, BC	604-986-0663
Dean Anderson, St. Albert, AB	780-803-9926
Jonathan Atkins, Toronto, ON	416-489-7888
Christian Audet, Sherbrooke, QC	819-434-1832
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
Andrew S. Banister, Calgary, AB	403-723-6602
Stephen Barbour, St. John's, NL	709-753-2260
Michel Baril, Sherbrooke, QC	819-821-2395
Roger Bartosh, Montreal, QC	514-631-6768
Leonard Basaraba, Vancouver, BC	604-664-5409
Dominique Bauer, Montréal, QC	514-396-9844
Philip Beauregard, Whistler, BC	604 902 1345
Geoff Bevan-Pritchard, Vancouver, BC	604-688-3244
Nick Bevington, Yellowknife, NT	867 445 9988
Max Bischof, North Vancouver, BC	604-985-6744
Jeremy T. Bishop, Oakville, ON	416-899-6410
Andrew Boettcher, Vancouver, BC	604-568-9373
Gordon J. Boneschansker, Fredericton, NB	506-452-1441
Charles Bouchard, La Baie, QC	514-708-7626
Eric Boucher, Québec, QC	418-871-8103
Eric Boudreau, Fredericton, NB	506-457-0595
Gordon D. Bowman, Gloucester, ON	613-742-7130
Michael Brady, St. John's, NL	709-726-3468
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
Sarfraz Chaudhry, Fort McMurray, AB	780-370-4227
M.P. (Michel) Comeau, Halifax, NS	902-429-5454
Marc-André Comeau, Salaberry-de-Valleyfield, QC	450-371-8585
Frédéric Côté, Sherbrooke, QC	819-565-3385
Louis Crépeau, Montréal, QC	514-931-1080
Paul Croteau, Verdun, QC	514-248-2680
Jean-Pierre Dandois, Magog, QC	514-592-1164
Dominic D'Aquila, St-Laurent, QC	514-747-0550
Fernando Davila, Calgary, AB	403-815-0755
Ameen DeRaj, Winnipeg, MB	204-800-2072
Harold Dibben, Trenton, ON	613-392-9287
Alexis Djumbong, Pierrefonds, QC	514-675-3941
Jean-Marc Dugre, Sherbrooke, QC	819-864-0609
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
Curtis Feeg, Calgary, AB	403-540-0677
Cameron R. Franchuk, Edmonton, AB	780-917-7137
Timothy P. Fraser, Bellingham, WA	360-937-0448
Richard Frehlich, Calgary, AB	403-281-1005
Brent D. Freiburger, Owen Sound, ON	519-376-7612
Alex Fulop, Vaughan, ON	905-760-7663
Brian Garrison, Calgary, AB	403-258-7212
Daniel Gauthier, Lanoraie, QC	450-887-2095
Bernard Gérin-Lajoie, Outremont, QC	514-279-4821
Sam Ghawe, North Bay, ON	705-472-3381
Ricardo Giannuzzi, LaSalle, QC	514-789-7400
Jean-Paul Giffard, Saint-Jean-Chrysostome, QC	418-839-7937
James M. Giffin, Amherst, NS	902-667-3300
Eric Gilbert, Sherbrooke, QC	819-563-8960
Robert Girard, Chicoutimi, QC	418-549-9687
Ali Asghar Gorji, Anjou, QC	514-271-9635
Movses R. Gulesserian, North York, ON	
Susan Guravich, Fredericton, NB	506-452-1804

John Stuart Hall, Ottawa, ON	613-789-0261
Dale Harrison, Comox, BC	250-339-4919
Matthew Hartog, Toronto, ON	416-368-1700
Ralph W. Hildenbrandt, Calgary, AB	403-245-5501
Gary L. Hodgson, Niagara Falls, ON	905-357-6406
David Howard, Burlington, ON	905-632-9040
Roman Hudon, Winnipeg, ON	204-255-7251
Alfredo M. Ilacad, Portland, OR	503-954-3230
David E. Impey, Calgary, AB	403-570-5118
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
Ron Kekich, Markham, ON	905-474-2355
Ryan Kendrick, Mississauga, ON	905-467-0900
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
Tim Krahn, Codrington, ON	1-888-537-9610
Keshava Arun Kumar, Calgary, AB	403-508-2899
Mankit Kwun, Richmond, BC	604-277-2254
Zoltan Lakatos, Burlington, ON	905-331-8307
Jonathan R. Lambert, Terrace, BC	250-635-7163
Olivier Lantier, Saint-Jean-Chrysostome, QC	418-839-7937
Pierre Laplante, Sainte Foy, QC	418-651-8984
R. Mark Lasby, Port Moody, BC	604-312-3624
Tony Latiza, Winnipeg, MB	204-221-2149
Barry F. Laviolette, Edmonton, AB	780-454-0884
René Laviolette, Lévis, QC	418-834-6172
Nazmi Lawen, Charlottetown, PE	902-368-2300
Graham Lawrence, Saint John, NB	506-634-8259
Marc LeBlanc, Dieppe, NB	506-382-5550
Paul-Maurice LeBlanc, Drummondville, QC	819-395-2752
Steve Lécuyer, Montréal, QC	514-333-5151
Jeff Leibgott, St. - Laurent, QC	514-933-6621
Claude Lelièvre, Québec, QC	418-861-8737
Salvatore Leo, Kirkland, QC	514-334-1234
Thomas Leung, Ottawa, ON	613-258-2544
William C.K. Leung, Woodbridge, ON	905-851-9535
Haijun Li, Markham, ON	905-479-9525
Chet Liu, Chatam, ON	514-351-9612
Clint S. Low, Vancouver, BC	604-688-9861
Ian Malcolm, Kemptville, ON	613-860-0923
James R. Malo, Thunder Bay, ON	807-345-5582
Frédéric Marquis, Montréal, QC	514-282-8100
Brian Mashford, North Bay, ON	705-494-8255
Alfredo Mastrodicasa, Woodbridge, ON	905-856-2530
Mohamed Matar, Winnipeg, MB	204-477-2512
Rein A. Matiisen, Calgary, AB	403-338-5804
Jean Stéphane Mbega Mve, North Vancouver, BC	778-628-8052
Brian McClure, Nanaimo, BC	250-713-9875
Mark McFadden, Chatam, ON	514-351-9612
Glenn J. McMillan, London, ON	519-453-1480
Shane A. McShane, Peterborough, ON	705-749-0003
Arvid Meland, Calgary, AB	403-716-8158
Andrew W. Metten, Vancouver, BC	604-688-9861

Jason Mewis, Saskatoon, SK	306-978-7730
Yannick Michaud, Pohénégamook, QC	418-859-2927
Mark Milner, Richmond Hill, ON	905-737-6881
Bahram Mirpourian, Thornhill, ON	416-676-1441
Namvar Moazzami, Calgary, AB	403-400-5345
Mark K. Moland, Lepreau, NB	506-659-6388
David T Molloy, Burlington, ON	905-332-1404
G. Abbas Nanji, Richmond Hill, ON	416-757-3611
Duy Nguyen, St-Nicolas, QC	418-831-7084
Rémi Octeau, Saguenay, QC	418-545-1150
Yannick Pageau, Québec, QC	418-914-9299
Neil A. Paolini, Etobicoke, ON	416-249-4651
Louis Paradis, Lac-Beauport, QC	418-572-8829
Françis Paré, Trois-Rivières, QC	819-373-1145
Serge Parent, Sherbrooke, QC	905-808-0344
Claude Pasquin, Montréal, QC	514-282-8100
Sinisa Pavlovic, Richmond, BC	604-270-8048
Xiaofei Pei, Houston, TX	281-529-7535
Tiberiu Pepelea, Trois-Rivières, QC	819-372-4543
Dave Perry, Gander, NL	709-256-7501
Michael Picco, Concord , ON	905-760-9688
Gérard Pilon, Valleyfield, QC	450-373-9999
Alain Pomerleau, St-Jean-Sur-Richelieu, QC	450-357-0955
Bertrand Proulx, Shawinigan, QC	819-537-5771
David Prud'Homme, Dorval, QC	514-833-4715
R. Paul Ransom, Burlington, ON	905-639-9628
Dan S. Rapinda, Winnipeg, MB	204-663-7775
Hamidreza Razaghi, Edmonton, AB	780-577-5662
Mehrak Razzvi, North Vancouver, BC	604-988-7131
Joël Rhéaume, Beauport, QC	418-660-5858
Remo Rinaldi, Montreal, QC	514-213-9471
John Rosenquist, Lake Zurick, IL	847-540-9286
James Rudy, Beaconsfield, QC	514-426-1638
Hossam Saleh, Toronto, ON	647-932-2460
Borendra Sanyal, Brampton, ON	905-874-3597
Chris Sargent, Grand Falls - Windsor, NL	709-489-9150
Joseph M. Sarkor, Kelowna, BC	250-868-1413
Ken Savage, Vancouver, BC	604-637-2275
Titus-Lucian Savu, LaSalle, QC	514-703-0374
Ron Schmidt, Saskatoon, SK	306-668-0293
Allison B. Schriver, Fredericton, NB	506-453-5122
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
Zigmund Slosmanis, Prince George, BC	250-564-1345
Lauchlin Smith, Edmonton, AB	780-409-3146
Rory A. Smith, Calgary, AB	403-806-1558
Terrence D. Smith, Toronto, ON	416-798-8770
Brian A. Snow, Gloucester, ON	613-747-5126
Ralph E. Southward, Hamilton, ON	905-639-7455
Steven Stelzer, Cote-Saint- Luc, QC	514-482-4984
Joseph Tam, Vancouver, BC	604-664-5257
Thor A. Tandy, Victoria, BC	250-382-9115
Nicolas Theodor, St. Catharines, ON	905-704-2381
Helene Theriault, Moncton, NB	506-875-0941
Bram Toomath, Vaughan, ON	905-580-4400
Mike L. Trader, Hamilton, ON	905-381-3231
Matthew Tremaine, Regina, SK	306-566-5868
Serge Y. Tremblay, St-Augustin de Desmaures, QC	418-878-3218
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
Serge Vézina, Laval, QC	514-281-1010
Joseph S. Vidican, Belle River, ON	519-999-7500
J.H.R. Vierhuis, Willowdale, ON	416-497-8600
Romano Viglione, Calgary, AB	403-804-0696
Roger Vino, Surrey, BC	604-576-7369
Dave R.M. Vrkljan, Calgary, AB	403-251-2578
Brian Waddell, Cambridge, ON	519-267-6789
Van Wall, St-Georges, QC	418-227-2040
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
Paul Zinn, Delta, BC	604-940-4050
Ken Zwicker, St. Albert, AB	780-458-6964

TECHNICAL - INDIVIDUAL

Anar Azer, Calgary, AB	403-973-7517
Frank Bastone, Woodbridge, ON	905-856-2189
Brett H. Clavelle, Saskatoon, SK	306-270-8105
Miguel Clement, St.Pascal, ON	613-297-9983
Paul Good, Vancouver, BC	604-255-0992
George Graham, Winnipeg, MB	204-943-7501
Scott Gullacher, Regina, SK	306-565-0411
Julius P. Magnaye, Calgary, AB	403-254-0544
Denis Mallet, Lutes Mountain, NB	506-855-3201
Patrick S. McManus, Cheyenne, WY	307-637-8422
Luciano Patricelli, Woodbridge, ON	416-568-0069
Angelo M. Ricciuto, Concord, ON	905-669-6303
Ronald W. Rollins, Burnaby, BC	604-453-4057
Firas Shaker, Oakville, ON	905-582-5924
Dan Shewfelt, Winnipeg, MB	204-488-6790
Asif Sultan, Mississauga, ON	905-848-4047
Meynardo Vendiola, Edmonton, AB	780-444-7116
Stuart Veysey, Fredericton, NB	506-452-7000
Kenneth Williams, Edmonton, AB	780-488-6969

Index To Advertisers

ADVANTAGE STEEL

Publisher
Michael Bell

Editors
Joanna Graham
Roma Ihnatowycz

Sales Manager
John Pashko

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

Graphic Designer
Caleb MacDonald

Published by:
MediaEdge

MediaEdge Publishing Inc.
33 South Station Street
North York, ON M9N 2B2
Toll-Free: 1-866-480-4717 ext. 229
robertt@mediaedge.ca

531 Marion Street
Winnipeg, MB Canada R2J 0J9
Toll Free: 1-866-201-3096
Fax: 204-480-4420
www.mediaedgepublishing.com

President
Kevin Brown

Senior Vice-President:
Robert Thompson

Branch Manager
Nancie Privé

Please Return Undeliverable Copies To:
CISC-ICCA
3760 14th Avenue, Suite 200
Markham, ON Canada L3R 3T7
Phone: 905-946-0864
Fax: 905-946-8574

PUBLICATION
MAIL AGREEMENT #40787580