

# STEEL

## Structural Steel

# Arts centre will feature exposed steel trusses inside

SHANNON MONEO  
CORRESPONDENT

When the David Foster Arts Centre opens in April 2011, there's a good chance the famed musician and producer will be on hand to unveil the \$4-million facility in his old hometown of Saanich, B.C.

Foster's possible appearance will likely draw plenty of spectators to a building that, beyond its recognizable name, features noteworthy structural steel work, said the project's architect.

Custom-shaped roof trusses will reference the shape of the existing building, to which the new structure will be connected, said Adam Fawkes, of Hughes Condon Marler Architects' Victoria office.

Set to start in July, the project involves construction of a new 800-square-metre arts centre and renovation of 300-square-metres of the existing art gallery and multi-purpose space at the Cedar Hill Recreation Centre.

The new construction will match the existing buildings, achieved by sloped steel frame roofing, said Donavon Bishop, project manager as well as Saanich's development and municipal facilities manager.

"It's quite an interesting design," he said.

Beyond the design, structural steel will be used for a majority of the new work, added Jonathan Reiter, the project's structural engineer and an associate at the Victoria office of Read Jones Christoffersen.

But it won't be standard, open web steel joists.

Those specially-made, long-span, scissor trusses

will likely be manufactured either in Victoria or Duncan, added Reiter, a 1989 graduate of the University of Calgary's engineering faculty.

And instead of standing seam metal on the inside, exterior sloped sections of the butterfly roof design, will be planted with grass or sedum, said Fawkes, a 2001 graduate of Dalhousie's architecture school.

The effect will complement the nearby large, grass bank.

The lower level of the exterior will be clad in cedar.

Inside the facility, the vaulted ceiling will show off the unique trusses, which will be painted a different colour than the ceiling deck, Fawkes said.

In many buildings, the structural work is hidden by finishes.

Not so here, said Reiter.

**"We'll be using heat generated by the kilns and putting that into the mechanical system."**

**Adam Fawkes  
Hughes Condon  
Marler Architects**

The new construction will create four areas: one 130-square metre pottery studio, two 100-square-metre fine arts studios and a recording studio with three music practice rooms.

The pottery studio will include a large kiln room and will contain two electric and two gas kilns.

The copious amounts of heat they give off won't be wasted.

"We'll be using heat generated by the kilns and putting that into the mechanical system," Fawkes said of the heat recovery plan.

"It would go straight up otherwise."

The two fine arts studios, meanwhile, will be open spaces with exposed concrete floors.

The vaulted ceiling will let in lots of natural light, a



HUGHES CONDON MARLER ARCHITECTS

The new David Foster Arts Centre in Saanich, B.C. on Vancouver Island is being built to reach LEED Silver certification. Structural steel is a big part of the project design.

necessity for many artists.

One feature is that the main corridor, running by the two adjacent fine arts studios, is made of movable glass partitions.

When closed, people can see into the studios, but noise is kept out.

When special events occur, the glass doors can be opened and one large space is created.

At the end of the corridor is the recording studio.

It is somewhat of the anchor tenant in the new centre, given Foster's heavy links to the music industry, Fawkes said.

Built three metres underground of custom cast concrete, the music studio will be a bunker of musical creativity, offset by one large and two small music practice rooms.

The roughly 60-square-metre, almost ground-level roof of the studio will serve as a stage for outdoor performances.

The structure will be built to LEED Silver standards. It's aiming for 33 out of a possible 70 LEED points.

Points are expected in

a number of areas including: erosion and settlement control, bike storage and change rooms, stormwater management, light pollution reduction, water efficient landscaping (50 percent reduction), a 20 percent water use reduction, 7.5 percent of building materials are of recycled content and the use of low-emitting indoor construction materials.

The arts centre was also roughed-in for a future solar hot water system, Fawkes said.

Before the sun can rise on the system, Saanich will seek grant money to complete the project. The new facility has received two-thirds of its funding from the federal and provincial government's Infrastructure Program.

Saanich contributed the remaining \$1.33-million.


Following the city's tradition of christening public buildings after prominent Saanich residents, the David Foster Arts Centre will be used by local visual artists, writers and entertainers.

"With a long list of Grammy Awards and Acad-

emy Award nominations to his credit, David has become a giant in the international music field," said Saanich Mayor Frank Leonard.



"He has applied his considerable talent to raising

funds for children requiring organ transplants. To recognize his musical success, humanitarian efforts and family ties in Saanich, council named the arts centre after David Foster."



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# STEEL

## Commodity Prices

# Steel prices expected to stay stable in short term

SAM VAN AERT

The volatility in steel prices in the first half of 2010 has impacted the construction industry in a number of ways. Many steel distributors aren't holding prices unless the customer is ready to purchase.



JEAN SORENSEN  
CORRESPONDENT

After recent increases, steel prices are expected to remain relatively stable in the next three to six months.

This expected stability follows on the heels of increases of up to 12 to 20 per cent worldwide.

However, no one in the steel distribution sector is betting on the stability or holding a quote, unless they see cash on the table.

Mike Maciag, inside sales supervisor for Wilkinson Steel (which last year added steel beams in five-foot multiples to its product line) said the volatility in the market has made it difficult to hold pricing.

"They will ask for a quote (and then once the project is firmed up) ask for a re-quote," he said.

Wilkinson, like other steel distributors, isn't holding pricing, unless the customer pays.

Maciag said the volatility seen in the first half of 2010 has caused many to simply hold off buying until they are close to project start-up.

Something that could kick prices forward by the end of June, said Maciag, is U.S. steel mills eliminating their "foreign fighter" discount, which is a break in pricing to match offshore suppliers.

But, the question remains just how much more can mills demand in the face of lukewarm demand.

Worldwide there are two moderating influences on steel prices: the lack of large-scale, steel-gobbling construction and that China is placing the brakes on its super-charged construction industry, fearing inflation.

While the demand side is sluggish, it is the supply side's raw materials that have gone through unprecedented upheaval.

Steel refineries rely on two main sources of raw material – iron ore used with coking coal and scrap metal.

Originally, iron ore and coking coal producers set an annual rate for refineries.

However, this year three of the major producers asked for quarterly reviews, with rate adjustments including factors such as spot sales into China (which produces half the world's steel) and the previous quarter figures.

That has thrown the industry into upheaval for the last six months. Also, the system creates a drag, whereby a lull in the economy in one quarter may suffer from increased

activity – and higher prices – from a previous quarter.

Steel mills are transitioning through the new system; some accepting, some fighting and others increasing the amount of scrap used.

This has caused scrap prices to rise as well. Steel mills are cutting capacity and relying on inventories, until the \$80 billion worldwide iron ore industry repositions.

Some question the rising prices.

"There is no visibility in pricing today," said general manager Harbinder Dhillon for Richmond Steel Recycling, which sends scrap to steel mill Nucor in Seattle.

"At one time you had 90 to 120 days visibility on pricing, but now you are down to zero."

Fabricators are waiting until the last minute to order and are getting orders on a "just-in-time" basis to ensure that there is no price change.

Also, he said, while Western Canada is busy, that isn't the case for most of North America. Most steel mills are only running at 60 per cent capacity.

Dhillon estimates that the volatility seen in the first half of the year will level off.

Gabe Davis of Davis Trading, which also buys scrap steel, said prices are down right now, but 2010 prices have been a roller coaster.

He's not looking for any kind of shift in prices until the end of summer.

Despite speculation that the Gulf of Mexico oil disaster and greater scrutiny of offshore drilling will accelerate Alberta's oilsands development, so far pipe prices haven't risen much.

"There's been a slight increase but I have not seen anything dramatic lately," said Darren Turecki, of Turecki Pipe & Steel, which supplies to the oil and construction industries.

Dave Hobden, economist for Central 1 Credit Union, recently published an economic analysis of B.C.

He is doubtful there will be much of a further rise in steel prices as there are few indicators of demand or fear of a supply scarcity.

He points to China's reduced growth and locally, the federal government's infrastructure program winding down in early 2011.

"Investment in buildings involving steel and heavy construction has been declining and I think will continue to ebb for another year," he said.

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# STEEL

## Innovation

# Alberta road crews installing new type of barrier

**STEPHEN DAFOE**  
CORRESPONDENT

RED DEER

The Alberta government is hoping to increase safety with the installation of North America's longest post-and-cable median barrier system along 119 kilometres of the Queen Elizabeth II (QEII) Highway.

The stretch of road between Airdrie and Red Deer should reduce injuries on both sides of the roadway, whenever a vehicle hits the median.

The \$8.2 million project, which includes a 3.5-km stretch through the City of Leduc, is currently being undertaken by Alberta Highway Services using a four-strand system manufactured by Gibraltar Cable Barrier Systems of Texas.

The median system is made up of high tension flexible steel cables that are threaded through collapsible steel posts.

When a vehicle makes contact with the system, the vehicle gets caught up in the cables, which act like the strands of a spider web, preventing the vehicle from crossing the median into oncoming traffic.

Additionally, the post-and-cable system reduces the likelihood of the hard impact typical of conventional concrete barriers and metal guardrails.

Ron Faulkenberry, general manager of Gibraltar Cable Barrier Systems said the backbone of the system is a ¾ inch diameter wire rope.

"It's three bundles of seven strands each," Faulkenberry said.

"Those three bundles are woven together like a regular rope."



However, unlike regular rope, the galvanized steel cables have a 39,000 pound minimum breaking strength and are supported by the fittings, which are rated at 36,800 pounds.

"I don't know of any instances with our system, or even some of the other systems, where the cable has actually broken," Faulkenberry said, noting he has seen fittings break.

**"The cable actually runs straight through the middle of the system, and you have posts on alternating sides."**

**Ron Faulkenberry**

"We believe that's how it should be," he said.

"It should be like a circuit breaker. If you overstress the cable, it becomes like over-hardened steel and becomes brittle."

But while the cable is not designed to break, the posts which they are attached to certainly are.

Each of the posts, spaced about 20 feet apart, is a roll-formed C-section post with an open seam down one side to create a socket for a hairpin clip that allows the contractor to attach the four cable strands in about 30 seconds.

These posts are set into a galvanized sleeve which is mechanically vibrated 42 inches into the ground.

Within the sleeve is a post stop, set 15 inches below

ground.

Faulkenberry said that the open post seams are offset in an alternating pattern two inches to the right and left of the cable line.

"The cable actually runs straight through the middle of the system, and you have posts on alternating sides," he said, noting that the system's design allows for the post to release from the cable.

"By alternating the posts, it actually becomes a bi-directional barrier," he said.

"It can be hit from either side."

The Gibraltar general manager said that in good soil, the vibrating machine is able to install a sleeve in about 45 seconds.

However, sleeve installation isn't the only fast part of the installation process.

Faulkenberry said the contractor is installing and tensioning about 15,000 to 20,000 linear feet of barrier per day, considerably more than the 12,000 linear feet that is the norm.

Faulkenberry said that



GIBRALTAR CABLE BARRIER SYSTEMS

A new post and cable median system is being installed along a 119 kilometre stretch of the Queen Elizabeth II Highway in Alberta. The system is intended to prevent vehicles from crossing the median.

although the cable is supplied in 2,000-foot spools, installation requires connecting the cable every 1,000 feet with a turnbuckle.

This allows the contractor to provide the right amount of tension, but also allows easier access to the opposite side of the highway for emergency vehicles.

The QEII and Leduc installation is Alberta's second foray into post-and-cable median technology.

The province previously spent \$1.4 million installing Gibraltar's three-strand system with cast-in-place concrete post supports in the spring of 2007, along 10 kilo-

metres of Calgary's Deerfoot trail.

It is a stretch of road that had seen several deaths in recent years, due to vehicles crossing the median.


Alberta Transportation reports that no cars have crossed the Deerfoot since the installation of the new system.

Since the original installation, changes in American Association of State Highway and Transportation Officials (AASHTO) regulations provided the province with the opportunity to save about \$5 million on the project by going to the less costly driven post system.

"As long as the barrier system met their crash-testing requirements, then they would qualify under our standards," said Mike Damberger, construction manager for Central Region, Alberta Transportation.

Damberger said that with the reduced cost of the system, it is likely that more post-and-cable barriers will make it into Alberta's construction program in the future.

"This is such a large project, we're going to be very interested to see how often it gets hit, what our maintenance implications are - that sort of thing," he said.



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# STEEL

## Reinforcing Steel

# Business rides the construction boom and bust

**BRIAN MARTIN**  
CORRESPONDENT

It started with two guys and a pick-up truck. It is now one of two companies that dominate the rebar steel sector of the B.C. construction industry.

The company is LMS Reinforcing Steel Group, a local firm with a head office in Surrey.

Sharing the top of the market with LMS is Harris Rebar a division of the Harris Steel Group.

LMS, which until fairly recently was known as Lower Mainland Steel was founded in 1987 by two iron workers, Ron McNeil and Ivan Harmatny – both of whom are still very actively involved.

At that time the two were only placing rebar.

In 1998 they expanded into fabricating as well.

From there, LMS quickly expanded.

Joining LMS recently as chief operating officer was Norm Streu, who is well-known in B.C.'s construction industry.

Before joining the team at LMS, he headed the Construction and Engineering Law Department at Alexander Holburn Beaudin & Lang, a Vancouver law firm.

He is also a past chair of the Vancouver Regional Construction Association and a past director of the B.C. Construction Association.

Streu chose an interesting time for a career change.

The steel industry was knocked on its heels by the drop in construction brought on by the 2008/2009 collapse of the world's financial industry.

LMS was forced to cut its workforce by close to half – down to around 300.

Around 150 of those were temporary foreign workers, who returned to their home countries.

Now that the market is recovering, Streu said they will likely miss those workers.

"We already anticipate there is going to be a prob-

lem with labour shortages coming up," he said.

"We're getting busy again and have hired between 50 and 60 guys in the past two weeks."

One of the reasons Lower Mainland Steel changed its name is its market.

It is reaching much further than it used to for work and is operating right across Western Canada.

To serve Alberta and the Prairie provinces LMS has opened a new totally enclosed 25,000 square foot facility in Southeast Calgary.

Currently, they have some 50 projects underway in B.C. and 20 in Alberta.

They are also doing a major transit train tunnel in Winnipeg.

Any business that depends on worldwide commodity prices is not for the faint of heart.

LMS employs a full-time steel broker, who spends his work day on the telephone calling right around the globe getting prices.

LMS and its competitors all had a wild ride when it came to steel prices over the past couple of years.

"The price of steel was escalating rapidly during the boom and hit some



LMS REINFORCING STEEL GROUP

**LMS and its competitors have had a wild ride when it comes to steel prices over the last couple of years.**

pretty dizzyingly high in 2008," said Streu.

"When the wheels started coming off the cart in September of 2008, it fell dramatically along with all other commodities. It dropped by roughly half over a very short period.

"We were buying very large volumes during the boom because we needed so much."

When the boom went bust, LMS suffered what Streu calls a double hit.

Not only were they

saddled with a lot of peak priced steel in a world in which steel was selling for substantially less, but many of the projects they were prepared to supply to were either cancelled or put on hold.

The ride has continued. "Prices bottomed out last fall," said Streu.

"Since January we have seen some quite rapid escalation. Between January and March prices probably went up 25 to 30 per cent."

That again, he said, is

very scary.

LMS's customers want firm prices for their steel and they expect LMS to assume the risk.

"When times were better and there were bigger margins, we could do that with a little more comfort," he said.

"When margins are razor thin and you have your base input cost escalating by as much as 25 per cent in three months, you can see the impact that has on multi-year projects."

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## Marketing

# Steel promoted as innovative green product

**DAN O'REILLY**  
CORRESPONDENT

Canada's steel sector is putting the pedal to the metal in a campaign to highlight the importance of both the product and the industry to the national economy.

The "New Steel" awareness campaign by the Canadian Steel Producers Association will promote steel as an innovative green product essential to local and national economies.

"We want to stress the importance of steel to the general public and government decision makers at both the bureaucratic and political level," said Ron Watkins, president of the Ottawa-based association.

About 30,000 people are employed in Canada's steel industry and hundreds of millions of dollars have been invested in new technologies in the past two decades, he said.

"We're involved in a lot of chains," said Watkins, noting while steel is a vital product in construction, it is as equally important in auto and other manufacturing.

"With the recession a lot of people have probably forgotten how important manufacturing is to our economy," he said.

That importance is why the industry has to take an active interest in overall industrial policies, he said.

A major theme of the campaign

is the ongoing development of new thinner, lighter and stronger grades of steel, which contribute to sustainability and energy efficiency.

New steels have helped to reduce the weight of vehicles by 25 per cent and are an essential material in renewable energy sources such as wind turbines, solar thermal panels and tidal energy devices, said Watkins.

The association will issue periodic news releases, publishing policy papers and networking with public officials.

It has also commissioned a University of Toronto professor to conduct a study on the issues and challenges that impact the steel industry.

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# STEEL

## The Steel Market

# Steel prices tumble from 2008 prices

RICHARD GILBERT  
STAFF WRITER

Falling steel prices have created great market conditions for construction, but private investors aren't yet taking advantage of the situation.

The cycle steel prices is seen in the North American price of long beams used in construction, which increased rapidly after 2004 and peaked at US\$ 1,165 per ton in August 2008.

Steel prices stayed at this level until the October 2008, when they dropped dramatically.

Falling demand from construction companies and car makers caused steel prices to dip rapidly to US\$ 905 per ton in the first week of November 2008.

"It's definitely, totally flip side, because prices are dramatically lower than last year" said Ed Whelan, president of the Canadian Institute of Steel Construction.

"The supply is there if you want to buy anything it's available. From the construction perspective, it's the best time to build a building. Unfortunately, no one is building, which adds to the downward pressure on prices."

Whelan said low prices,



BRADLEY FEHR

The price of steel has dropped in recent months.

excess supply, the recession lack of finance, over capacity in fabrication and the wait for public infrastructure funding have all combined to delay projects.

"The recession was felt around the world and commodity prices fell dramatically," said Reed Construction Data economist Alex Carrick.

"There was also not the demand for steel that there was in 2007 and 2008. Private investment in construction has fallen off and there is a window of opportunity in the next year. But, after that construction prices may go up again."

The north American price of long beams was about US\$295

per ton at the beginning of 2000. By January 2002, the price went up to about US\$395 per ton and then fell to back to US\$295 per ton in March 2003.

By October 2004, the price had jumped up to US\$580 per ton and then fell back again to US\$500 per ton in July 2005.

After staying at this level for a few months the price of steel went on a long run up to a peak of US\$ 1165 per ton in August 2008.

"In terms of construction materials, such as steel, there were two peak periods in 2004 and 2008," said Carrick.

"In 2004, the peak in prices was driven by residential construction, as well as the emer-

gence of China as an economic force around the world. In 2008, there was a different market mix, with more non-residential construction and there was still the effect of China."

According to Carrick, all commodities, such as iron ore and coal followed this cycle.

The headline commodity was oil, which peaked at nearly \$150 a barrel in July, 2008. The increase in oil prices also led to an increase in transportation costs.

These were all factors that contributed to the big run on construction prices.

"The price of steel affects everything from rebar, nails, ready rod, threaded rod, form hardware, fasteners, and nuts and bolts," said Thomas Foreman, president of the Building Supply Industry Association.

"The impact of that (price increases) was that some have looked at alternative ways of building and supply. Product was sourced from lower cost suppliers, but this created some issues."

Foreman said the lower cost suppliers were not domestic. This change opened the door for products coming from countries such as China and India.

## Advanced Learning Symposium expected to be totally tubular

RICHARD GILBERT  
STAFF WRITER

The Subcommittee for Tubular Structures XV-E of the International Institute of Welding (IIW) has decided that the 13th International Symposium on Tubular Structures (ISTS 13) will be hosted by the University of Hong Kong.

The symposium, which will take place from Dec. 15 to Dec. 17, 2010.

It is considered the principal showcase for tubular structures and the prime international forum for discussion of research, developments and applications in this field.

The conference would be of interest to manufacturers of hollow sections or related construction products.

It should also appeal to architects, trade associations, design engineers, steel fabricators, owners or developers of tubular structures, researchers, academics and postgraduate students.

The Proceedings of the Symposium will be published in a single-volume, hard-bound book, which will be available on CD. All abstracts, papers and oral presentations are required to be in English.



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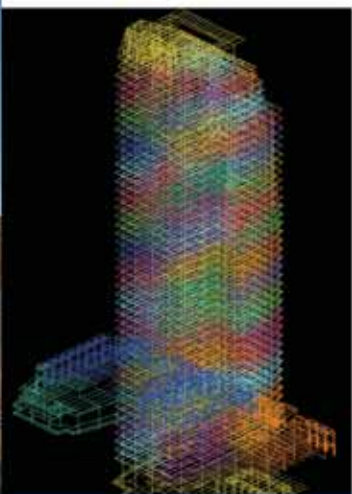
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# STEEL

## Structural Steel

# New Vancouver Convention Centre sports unique design

**RICHARD GILBERT**  
STAFF WRITER

The unique design and shape of the new Vancouver Trade and Convention Centre was made possible by the fabrication of structural steel components by companies from B.C. and Quebec.

"One of the reasons steel was used on this job was because the spans were very long" said Michael Holleran, Canam's engineering manager for western Canada and Ontario.

"To go with anything else other than steel was not feasible on this span."

PCL gave the contract for the erection of the structural steel, joists and decking on the Vancouver Trade and Convention Centre project to Canron Western Constructors.

Canam Canada was contracted by Canron to fabricate 3,000 tons of joists and steel deck for the expansion of the convention centre.

"The biggest challenge was shipping and erecting the very large and heavy trusses that span the exhibit hall," said Harold Roberts, project manager with Canron.

"Some of the trusses were 21 feet deep and 100 feet long

and were spliced together on the job site to make a span of about 200 feet. When you look at the expanse of open area and the ballroom, you see how enormous an area it is to erect."

The use of the massive trusses allowed the construction of the largest waterfront convention centre in Canada.

The building has Canada's largest ballroom, 52 different meeting rooms, a six acre green roof and an exhibit hall larger than the playing field at BC Place.

The project is technically an expansion, but it included the construction of a new facility, not far from the existing centre at Canada Place.

Holleran said the construction of the massive project required Canam to work closely with consulting engineering firm Glotman-Simpson Group of Companies to resolve some very complex problems at the project design stage.

"The key factors of building that affected us came early in the process because it was fast tracked," said Rob Simpson, who is a partner with Glotman-Simpson.

"This means the project was tendered before the architectural design was finished. We needed to get a structural solution early that would deal with the major challenge of the large interior space and the green roof."

Simpson's firm did a careful layout of the wall trusses, which put the heaviest load on primary support lines. This allowed the structure to



BOB MATHESON

The new Vancouver Convention Centre included about 17,000 tons of structural steel and 1,487 tons of steel joists.

be adapted to the architectural design, as it was finalized.

The main challenges of this project couldn't have been overcome without the use of Tekla steel software to model the project in 3D.

"The whole building was very tricky from design concept to 3D modeling. If it wasn't for the 3D modeling, the building wouldn't be up yet," said Roberts.

Simpson agreed. "We took some very complex information and moved forward quickly," he said.

"Without the 3D model it would have been very difficult for contractors who are tendering to understand the building and tender efficiently."

According to Simpson, if the design was done the

old way, it would have taken a building full of detailers to finish the work in the same time. However, there would have been a lot more errors.

The convention centre has tripled in size, from 133,000 square feet (12,236 m<sup>2</sup>) to 474,000 square feet (43,608 m<sup>2</sup>).

This project required the fabrication of structural steel components, including bowstring and barrel joists and special bracing due to the unique shape of the building, which extends on three sides along the waterfront.

Roberts said the new convention centre was built with 17,000 tons of structural steel, 1,487 tons of joists, and the stairs and hand rails weighed 162 tons.

There was a total of 21,248

structural pieces. At the peak of construction, about 100-120 steel workers were on site and about the same number in the shop.

The structural steel was fabricated at Canron's shops on Annacis Island in Vancouver and in Portland.

The joists were produced at Canam's plant in Calgary, Alberta, and the steel deck at Canam's Boucherville, Quebec plant.

Fabrication of the steel components was done from August 2006 to July 2007, and a total of 135 loads were needed to move these components to the construction site.

The steel erection started in October 2005 and finished in Sept 2008. The new convention centre opened on April 3, 2009.

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## BCICA

British Columbia Insulation Contractors Association

[www.bcica.org](http://www.bcica.org)

# STEEL

## Light Gauge Steel

### Developer makes the case for steel instead of wood

**SHANNON MONEO**  
CORRESPONDENT

A western Canadian developer wants builders who use wood to reconsider their choice.

"It won't rust, burn, rot, mould. There's no nail-popping," said Frank Jamali.

"If you design it right, it can last hundreds of years."

Jamali, an engineer, and now a B.C.-based business developer is talking about a pre-fabricated, light gauge, galvanized steel framing system.

His company, Mega Building Systems (MBS), holds the Canadian and U.S. patents.

At the company's 90,000-square-foot Calgary plant, it rolls out what amounts to the entire superstructure of buildings up to eight storeys tall.

"What makes MBS unique is that we're one-stop shopping. We have engineering, manufacturing, site erection and crane services," Jamali said.

The company produces light gauge steel framing, steel joists and steel joist girders.

MBS's light weight, non-combustible components include load-bearing walls, floors and roof.

The heart of the system is the isolation beam, formed when concrete is poured over steel pan decking directly above load-bearing walls.

Wall panels are pre-built and panellized.

Floors are made from shallow, open-web steel joist and light-form deck with a regular concrete topping.

Roofs can be standard wooden-truss, light gauge steel-truss or the flat built-up variety.

All pieces are shipped to the job site and quickly assembled because they are pre-cut.

"It's like Lego for children. Every piece has a number on

it," Jamali said.

More than 80 per cent of the steel (cold-formed, galvanized steel rolls) used by MBS is recycled, coming from various mills, he added.

Cold-formed steel is actually formed at room temperature into flat sections that are usually one to two millimetres thick, but can be formed up to one-inch thick.

Capable of replacing formed concrete, block and plank, structural red-iron and wood structures, MBS's products are suitable for hotels, motels, condominiums, apartments, seniors' or students' residences and care homes.

In the U.S., where MBS's three offices have shrunk to one, it's common for single-family homes to be built with light gauge steel framing, Jamali said.

In fact, he likes to point out how steel framing is preferable to wood-frame construction.

Combustible, wood frame structures have a life of about 30 to 40 years.

Shrinkage, cracked dry-wall, nail pops, plumbing problems, lost energy and water penetration are risks associated with wood construction, he said.

A five-year study conducted on test homes in the U.S. and Ontario found that light gauge, steel frame buildings should last about 270 years.

The Steel Framing Alliance and the U.S.-based National Association of Home Builders based their findings on results, which showed that almost no galvanizing was lost.

But Steven Fox, general manager of the Cambridge, Ontario-based Canadian Sheet Steel Building Institute, said that the environment and maintenance play a role in a structure's longevity.

And, when combined

with the fact that the typical lifespan of a building is 40 to 50 years, the almost three-century existence may not be that significant.

Other advantages over wood include about two per cent scrap/waste versus 20 per cent for lumber, fire ratings of up to two hours, noise reduction, insurance discounts, straight walls and square corners.

But the stable, recyclable material comes at a higher price.

In Canada, MBS's products sell for about 15 to 20 per cent more than wood.

"Steel, piece per piece, is more expensive than wood," said Fox, also an engineer.

He didn't have statistics documenting the extent of steel frame construction in Canada, but he did say there are roadblocks.

In addition to higher material costs, a ready supply of experienced labour may be hard to secure.

Also, some areas in Canada may not have the infrastructure or equipment to handle the projects.

But with a trained crew, construction projects using the system are not more difficult than traditional wood construction, Fox added.

In fact, such buildings often go up faster.

A crew of about 10, including a crane, can build 12,000 square feet of walls and floors in one week, Jamali said.

The Mega Group of companies started 20 years ago in Victoria with a crane division. One decade later, it moved into light gauge steel framing and today has about 150 employees in the Calgary factory, Toronto engineering office and the Surrey administrative premises.

MBS is not a member of the Canadian Sheet Steel Building Institute, which has 27 members, 80 per cent of them located in Ontario and Quebec.



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# STEEL

## Building Envelope

# Wire mesh popularity growing with new uses

CAMBRIDGE ARCHITECTURAL  
Wire mesh's durability and ability to withstand extreme weather in building envelope applications is demonstrated by its use in a Winnipeg Airport parking facility (right).



PETER KENTER  
CORRESPONDENT

Woven stainless steel metal mesh is a versatile building material used for reasons as diverse as security or aesthetics, but increasingly it's being used as a building envelope material, promoting sustainability and a reduction in solar heat gain.

Closed, tight weaves can block illumination com-

pletely, while open patterns allow a specified amount of light to pass through.

Where it's used alone as the sole building envelope material, wire mesh offers unrestricted ventilation while providing an enclosed appearance.

"It's still a fairly new product for building envelopes in North America," said Larry Windsor, director of sales and business development at Cambridge Architectural Ltd. of Cambridge, Md., the world's largest manufacturer of woven metal products for industrial and architectural applications.

"An architect needs to know a little about the product and like the look of it before they consider using it — although one of the cool things about the product is the way it looks in various lighting conditions."

The company was founded almost 100 years ago, manufacturing wire cloth for filters.

In 1956, the Otis Elevator company approached the enterprise to provide a durable metal mesh product for the inside of elevator cabs used in New York's lavish Seagram Building skyscraper.

"We were in that business for about 45 years," said Windsor.

"If you look at those elevators today, the product looks as good as the day it was installed."

Architectural mesh façade products were already established in Europe, but as local demand for the product declined in the mid to late-1990s, some manufacturers began to promote these products in North America.

"As these design trends began to gain momentum here, we established our architectural division in 2002," said Windsor.

"While they were largely supplying only the product, we offered it as part of a design-build or design-assist package. Working hand-in-hand with architects, we added value engineering and tried to make the integration of the product as seamless as possible."

Because the mesh can be used in many types of applications, much of the design effort goes into decisions about how the product will be fastened to the structure.

"The most time-consum-

ing part is the attachments themselves," he said.

"Once the fastening system is designed and installed, the mesh goes up quickly. On a recent job in Harrisburg, Penn., we installed 6,000 to 7,000 square feet (550 to 650 square metres) of mesh per day. We often install, but we can also provide a project manager to go to the job site and oversee the sub-trades who are performing the installation."

Stainless steel can be interwoven with brass, bronze and copper for different visual effects.

The mesh can also be used on its own in parkade structures or installed over and under glazing as a solar shield.

One of the company's signature Canadian installations is the four-level, 1,600-space parkade at Winnipeg James Armstrong Richardson International Airport, completed in 2006.

Built by PCL Constructors Canada and designed by Cesar Pelli & Associates, the parkade is wrapped in metal mesh that forms the cladding for the structure.


"This is the first airport project in Canada and one of the first airports in North America, to target Leadership in Environmental and Energy Design (LEED) certification," Windsor said.

"Our woven metal mesh contributes to the sustainable attributes of the redevelopment. From a LEED standpoint, this is stainless steel that's 100 per cent recyclable and made of recycled content to begin with. It meets building codes and offers a closed look, while there's no additional strain on the HVAC system to prevent carbon dioxide from entering the stairwells."

Windsor said that the company uses the Winnipeg project as a demonstration of the ability of metal mesh to withstand winter conditions.




"Some people are concerned that the mesh will hold on to ice and snow, but the openness of the mesh and the geometry of the holes doesn't allow snow to cake to it," he said.


"When potential clients ask us if the mesh will hold up in harsh weather, we just point to the Winnipeg airport and tell them, 'this is about as harsh as it comes.'"



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