The Canadian Institute of Steel Construction
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And the Winners Are…….

Rogers Place
Winner of the 2017 Collaboration Award
An award for a project team who demonstrates "value added" to the project through collaborative project delivery approaches throughout the design and/or construction process.

Owner: City of Edmonton
CISC Fabricator/ CISC Detailer: Canam Group Inc.
Architect: HOK
Engineer: Thorton Tomasetti
CISC Engineer: DIALOG
General Contractor: PCL Construction
Erector: Alco (Joint Venture Partners LPR Construction & Whitemud Ironworks Limited)
CISC Erector: Walters Group Inc.

Rogers Place, the new home of the Edmonton Oilers, is the most modern arena in the NHL. The building is double the size of the team's old home and features the largest centre-hung high-definition scoreboard in the world.

While the word "big" is used often in describing the completed facility, "fan experience" and "collaboration" were key features of its design and construction. Every aspect of the building was thought out in detail and everything was kept out of view of the fans. Moment frames keep concourses free of obstructions, mechanical units larger than a city bus are hidden away and insulated so as not to be heard, and electrical services have just eight feet of wall space to route conduit from electrical rooms.

"There was great collaboration on the project," says Serge Dussault, Vice President, CANAM Structures. "We had the luxury of being put on board very early and we were given a period of time to go back into the design to make improvements.

"One challenge we had was the thermal contraction and expansion of steel in the construction phase due to weather. We were able to incorporate some details that would deal with the differences in temperature that no one could predict."

The arena roof presented another challenge, Dussault says. “In an arena we cannot do it all from the outside. You’d need gigantic cranes and you also don’t have the real estate outside the building.” CANAM, the erector, and the consultant had done many arenas and had enough experience to redesign the construction and arrange the exit of equipment on the project. “We basically redesigned the roof. It was totally different from the original, from 10 or 12 planar trusses to two box trusses. Major early collaboration on the roof made a big difference.”

The architect, engineer, contractor, fabricator, and erector all worked with 3D models to facilitate collaboration. Many components were prefabricated offsite. These all interfaced with the fabricator’s structural steel and required coordination prior to arriving on site. The fabricator’s BIM detected any clash and provided solutions before steel fabrication started.

For this project, the fabricator manufactured 9,000 tons of structural components and created 8,000 drawings. To illustrate the scale of some of the steel components, the truss that sits directly over center ice measures 338 feet long and weighs 400 tons.

Studio Bell
Winner of the 2017 Architecture Award
Steel structures in which architectural considerations predominantly influence the design, particularly those with exposed steelwork. (All building types and bridges.)

Winner of the 2017 Steel Edge Award
An open category demonstrating excellence in the application of steel design, fabrication, detailing or finishing. These projects demonstrate tremendous ingenuity in addressing unique design, resource or application challenges.

Owner: National Music Centre
CISC Fabricator/ CISC Detailer/ CISC Erector: Walters Group Inc.
Architect: Kasian Architecture, Allied Works Architecture
CISC Engineer: RJC Engineers
General Contractor: CANA Management Inc.
Other: DukeEvans Inc,

Studio Bell, home to the National Music Centre, is a building unlike any other in the world. Considered a gateway to Calgary’s revitalized East Village, it has won many awards including a World Architecture Award in the Future Cultural Category and several Consulting Engineers of Alberta Awards of Excellence. Twenty years ago, it would have been impossible to build.

The architectural vision for this museum, performance hall, interactive music education centre, recording studio, and broadcast centre is inspired by the Rocky

Mountains, the hoodoos, and the wide open prairies. Every aspect of the structure is curved or inclined, presenting a hugely complicated geometry.

"There were many specific challenges in this project," says Kevin Zwaagstra, Design Engineer, Read Jones Christoffersen Ltd. "The main challenge ended up being the collaboration of the builder, the architect, and the engineers. The defining characteristic of the project is the success of the design team to recognize an architectural vision and respect it without compromise. They achieved exactly what the architect wanted for the space. This is not just about housing people; it's about art and you don't compromise on art."

Concrete was originally considered as the main structural material. Pouring cast-in-place concrete would have made for a much simpler structural design. "But that would have been obscenely expensive," Zwaagstra says. "Also, we had a strict construction schedule to meet.

"Steel was not the obvious choice right away, but it was the only material that realistically could do the job economically and practically."

Steel is milled in straight pieces, but Studio Bell features mostly curved surfaces. Achieving the desired shape required finding pathways within the curved walls where straight steel columns could reside. These pathways were not typically vertical or square with the floor framing. A steel sub-contractor was engaged in a design-assist role to work closely with the construction manager, structural engineer, and architect to find ways to build and connect the many elements.

"There was a high level of planning at the head," says Zwaagstra. "It would have been impossible without the expertise of the steel fabricator. You couldn't have done it without digital modelling to get the accuracy that was needed. In an age of paper drawings you wouldn't have been able to build it.

"At the end we recognized we had created something very special. When you step into the space you can feel it almost effortlessly defy gravity."

Emerald Hills Leisure Centre
Winner of the 2017 Building Communities Award
Steel structures created as part of a community development project with a focus on serving community needs. This includes, but is not limited to, municipal government projects, not for profit companies, art installations and other installations (all building types, bridges, and structures). Projects that impact and enhance the community around them will be considered.

Owner: Strathcona County
CISC Fabricator: Sturo Métal Inc.
Architect: Marshall Tittemore Architects
CISC Engineer: RJC Engineers

General Contractor: Graham Construction Engineering LP

The new Emerald Hills Leisure Centre in Sherwood Park, with its focus on learn-to-swim programs, plays a key role in Strathcona County's Aquatic Strategy. At another level, the successful design and fabrication of the building illustrate key trends in the construction industry.
"The biggest issues on the project were around the coordination of the geometry and the detailing for the envelope of the building," says Jeff Rabinovitch, Principal, Read Jones Christoffersen Ltd. "The most striking aspect of the building is the architecture of the exterior. The structure's angulated façade required close collaboration between design and fabrication. The project was very intricate in that respect."

Structural steel was the only building material that would successfully achieve the architectural expression of the building. To provide a column-free structure over the pool basins, long span steel trusses were used. Round HSS steel columns up to 406mm in diameter are prominently exposed around the perimeter of the Pool Hall. To accentuate the dramatic angular expression in the northwest corner of the building, the steel roof structure is cantilevered almost eight metres to achieve a column-free, fully-glazed promontory.

"All is supported by a gridwork of structural steel," Rabinovitch says. "Success came through the fabrication process."

Successful completion of the architectural vision relied on Building Information modeling (BIM) and collaboration with the steel fabricator during construction. Also, 3-D modelling during the shop drawing production phase meant conflicts could be addressed in the fabrication model before the steel support elements were shipped to site.

"When we worked closely with the fabricator and he put it all into a 3-D model, we were able to understand the complex geometry and work through issues as they came up. If the fabricator didn't take on that responsibility we wouldn't have been able to do it."

Twenty years ago, the architect would have presented the vision, but the team would have had to come up short of what was required, Rabinovitch says. "Now the engineering and fabricating community are responding by using technology to achieve what the architect wants. The sooner they are brought onto a project, the more successful it will be.

"Technology allows us to achieve more interesting shapes with steel structures, and allows it more economically, too."

Schulich School of Engineering, University of Calgary
Winner of the 2017 Engineering Award
Steel structures in which engineering considerations and the efficient use of steel in unique applications are the predominant factor. (All building types and bridges.)

Owner: University of Calgary
CISC Fabricator/CISC Erector/ CICS Detailer: Supermétal
Architects: Diamond Schmitt Architects, Gibbs Gage Architects
CISC Engineer: RJC Engineers
General Contractor EllisDon

The Schulich School of Engineering at the University of Calgary has been transformed from a horseshoe-shaped labyrinth of seven linked concrete buildings erected in the '60s and '70s into a modern campus with a heart of steel.

"The original buildings were built very robustly in concrete," says Stephen Mahler, Partner, Gibbs Gage Architects. "Using an integrated design process, Prime Consultants Gibbs Gage Architects, Collaborating Architects Diamond + Schmitt Architects and Structural Engineers, RJC worked closely with University of Calgary's Campus Architecture and facilities team to design a new building in the middle of the horseshoe. Our goal was to create a light, open feel, and steel helped us to accomplish this."

The expansion involved the insertion of an 18,300-square-metre glass box into the centre of the existing engineering campus, creating a much-needed heart for the faculty. Along with renovations to 11,000 square metres of existing space, it provides capacity for up to 400 additional engineering students.

"We used steel to tie it all together where the geometries collided," Mahler says. "Elements of the structure were not hidden but purposely left visible to create opportunities for teaching."

This complex project was an opportunity for the architects and engineers to use structural steel in many different ways to solve a variety of challenges. For example, two 17-metre-high cross columns can be seen through the glass walls of the south entrance. They both support the building and celebrate engineering.

One of the key visions for this project was to put engineering on display. Carefully considered use of Architectural Exposed Structural Steel (AESS) enhances the visible engineering details. A storey-height truss between the third and fourth floors clear spans over existing lecture theatres and displays bolted connections; feature stairs are supported from the roof on steel hanger tension rods; and columns are located away from the floors they are supporting.

Massive exposed steel elements are required to achieve this elegantly simple expansion by allowing application of a very regular geometry over and through a nest of angled walls and shifting building grids that do not align. In every instance, these new impressive steel members are learning experiences for the students.

The success of the project required efficiently engineered solutions for several areas including seismic upgrades and other elements linking the six structures that form the new complex. These solutions for areas where structure was not a feature helped maintain the project budget.

St. Louis Hotel
Winner of the 2017 Sustainability Award
Steel structure in which steel has been used or re-used as part of a sustainable development project that aims to improve environmental impact of the structure by using innovative practices, standards and technologies.

Owner: Calgary Municipal Land Corporation
CISC Engineer: Entuitive
Detailer/ Erector: AAA Steel
Architect: Nyhoff Architecture
General Contractor: CANA Construction

Calgary's St. Louis Hotel, once former Alberta Premier Ralph Klein's favourite watering hole, has been reborn as a key element of the 8th Avenue SE cul-de-sac connecting the city's East Village to the downtown core. Built in 1914 in anticipation of the extension of the Grand Trunk Pacific Railway to Fort Calgary, the hotel was designated an historic site by the City of Calgary in 2008. It was purchased and restored by the Calgary Municipal Land Corporation as part of a 20-year plan to revitalize the East Village and return the area to its grandeur as the city's centre.

The building's age and historical designation made the project both intriguing and challenging, says Justin Fried, an engineer with Entuitive. "It meant the exterior had to be preserved according to the city's historical requirements. Inside, the wood floors were wavy and unstable. We pondered how to resolve the issue of maintaining the historic appeal while essentially building a new structure."

The hotel's famous neon sign and the front façade of the building, including its white panelling, were preserved and reflect the structure's appearance in 1949. Internally, exposed masonry, electrical, mechanical, and structural elements maintain the original character. Given the condition of the building, steel was selected for beams and columns to minimize the additional weight on the footings, Fried says.

"By using steel, we were able to take site measurements and fabricate elements precisely for the as-built condition. It would have been harder to do with other materials. If using concrete the additional weight would have been hard to deal with."

The three-storey building was actually constructed from the top down, Fried adds. Rebuilding the skeleton from the inside involved steel being brought in through the roof. The result is “truly a building within a building,” Fried says. Using a new steel frame allowed for the existing heritage mill floor to be maintained and for the installation of concrete slabs over the old mill floors, giving the appearance of solid wood flooring overhead as a ceiling finish and flat concrete floors underfoot.

“It was fun to work on an historic building and to preserve it for another 50 to 100 years,” Fried says. The building is now a high-end modern mixed-use space with a variety of retail options.