ArcelorMittal

steeldesign

SPRING 2018 | VOLUME 50 | NO. 1

steeldesign 50 years – ans construction métallique

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PROJECT SUBMISSIONS

Do you have a project using sheet steel that you would like to see in *Steel Design*? The editor welcomes submissions of completed buildings – commercial, institutional, industrial, recreational and residential – using components made from steel, including cladding, steel decking, light steel framing, steel roofing, steel doors, steel ceiling systems and steel building systems. Please send a description of the project, including photographs, to:

The Editor, *Steel Design*
1039 South Bay Road
Kilworthy, Ontario P0E 1G0
E-mail: davidfollis@vianet.ca

CHANGE OF ADDRESS, NEW SUBSCRIPTIONS

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COVER PHOTO: Commonwealth Community Recreation Centre, Edmonton, Alberta
PHOTOGRAPH: Jim Dobie

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50 Years of Continuing Service to the Architectural Construction industry

This is the 50th Anniversary issue of Steel Design and we thank readers for their continued readership and on-going support. ArcelorMittal Dofasco's objective has and continues to be, to publish examples of how steel is used in completed buildings incorporating steel cladding, pre-engineered steel building systems, cold formed steel sections, standing-seam roofing and light steel framing. Also, to help keep professionals in the building construction field appraised of new and improved steels that may assist them in their designs.

Steel Design was first published in 1969 as a two-page newsletter, inserted in Canadian Architect and Canadian Consulting Engineer magazines. In 1972 the format changed to an eight page, four-colour pamphlet, with the primary distribution being by direct mail.

In 1979 Robert Gretton, the publisher of Canadian Architect Magazine, took on the added challenge of becoming the editor of Steel Design and remained the editor until his retirement from Canadian Architect. Over the next number of years the magazine experienced several redesigns and expanded to its present size.

Steel Design occupies a role as the only publication in Canada devoted to steel cladding and other non-"structural" steel building components. This unique position has resulted in a growing circulation base and strong continuing reader response. As the architectural construction field is continually evolving, we will endeavor to remain current.

Steel Wall Cladding – Versatility, Flexibility and Lightweight

The award-winning Commonwealth Community Recreation Centre (CCRC) is now five years old. Commissioned under the City of Edmonton's revamped RFP process, the choice of steel for the superstructure and cladding was key in delivering the design excellence and project efficiency called for by Edmonton's civic revitalization mandate.

The LEED Silver building resulted from a joint-use partnership between the City of Edmonton and the Edmonton Eskimos Football Club.

MJMA of Toronto along with local partners HIP Architects (now Kasian) built on and expanded the formerly underutilized site of the 1978 Commonwealth Stadium, cleverly combining: stadium activities, football operations, and a fitness and community centre. The integrated facility was designed to allow three diverse partner groups to share their program specific amenities. Co-locating these amenities unlocked site synergies, enhancing benefits and revenues while the park-like configuration has helped reinvigorate the community.

The CCRC was envisioned as three masses – gymnasium, aquatics, and field house – combined into one. The field house was slated to be open in time for the November 2010 Grey Cup Championships, which necessitated phased construction to a fast track schedule. Clark Builders and structural engineers RJC proposed long span spoke steel trusses, prioritizing local fabrication and delivery to stay on schedule and within the tight city budget. Moving full speed ahead with the steel design allowed the team to get a jump on the field house, the first project out of the blocks.

The three masses define the building's structure, whose

"We let the formal aspect – the shape – be the key feature. The steel cladding lent itself to this because it is a uniform, continuous materiality that allows the formal qualities to be really clear."

Ted Watson, Principal, MJMA

Photo: Tom Arban

The façade is clad with .91mm (.036") pre-painted AZM275 (G90) galvanized standing seam steel cladding, coloured QC2624 Bright Silver, which begins at grade and slants upwards to form a canopy above the main entrance.

Photo: Jim Dobie

dynamic angular geometry and bold steel rooflines provide a striking counterpoint to the monolithic concrete bowl. MJMA Principal Ted Watson, describes: "We wanted the building to read at the same scale as the stadium. We let the formal aspect – the shape – be the key feature. And the steel cladding lent itself because it's a uniform, continuous materiality that allowed the formal qualities to be really clear."

A façade clad with .91mm (.036") pre-painted Z275 (G90) galvanized standing seam steel siding coloured QC2624 Bright Silver, begins at grade and slants upwards to form a canopy above the main entrance. Steel cladding is often a default material for large buildings due to its versatility, flexibility, and lightweight nature. And because of its cost effectiveness, the architects, who favour a limited material palette, were able to wrap it around the entire complex. Making this typically austere, utilitarian material special, however, is a challenge MJMA and HIP met with confidence. "There's a humility and pride to this industrial language of buildings," says Watson. "Our job is to elevate these commonplace materials so they have a civic presence by giving attention to how the material is expressed, its detailing and execution." Other materials include ceramic-fritted glazing and a tessellated phenolic wood panel system at canopy and window openings.

A large cladding mock-up on site enabled the team to resolve the most intricate transition points: soffit, parapet, and corner details. MJMA worked with the cladding manufacturer and installer to develop a potentially minor but perhaps critical detail: the soffit panel termination. By folding the 300 – 400mm (11.8" – 15.75") wide panel back over the parapet, the need for a cap was avoided. Allowing the vertical seams to complete at the top lends a more abstract quality. While tried and true is a lower risk proposition, MJMA uses the cladding in a different way on each project, developing it in a way that is more interesting or innovative in approach to its materiality use.

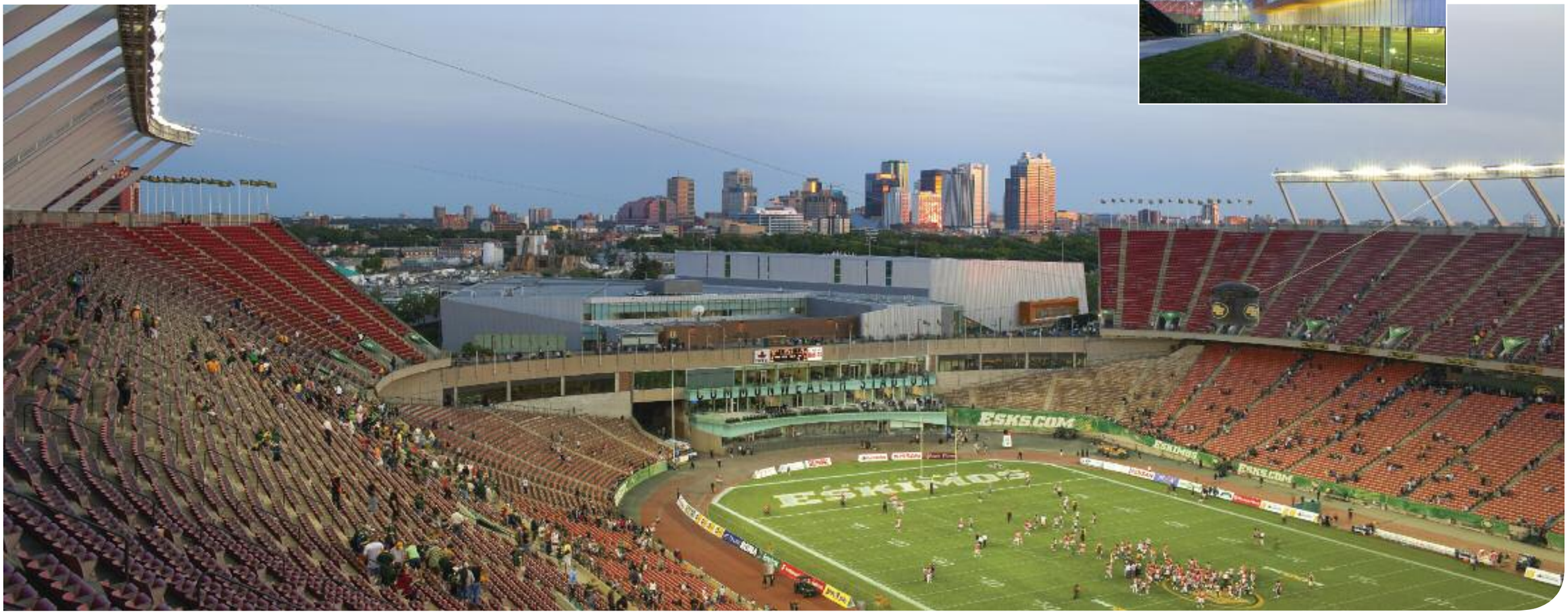
And the pre-painted .91mm (.036") Z275 (G90) galvanized steel cladding continues into the interior. In the field house, for instance, a prefinished white steel liner negates the need for furring out and operates as a vapour retarder. Two layers of double strapped insulation reduce thermal bridging, which can be an issue in Edmonton's climate. An additional benefit of a unified cladding system is the complete envelope stays with one sub-trade.

"It is a real go-to material because of its durability, its availability and its ease of installation. It is reliable and always meets our construction schedule."

Ted Watson, Principal, MJMA

The three masses define the building's structure, whose dynamic angular geometry and bold steel rooflines provide a striking counterpoint to the monolithic concrete bowl.

Photos: Tom Arban



DESIGN AND CONSTRUCTION TEAM

OWNER: City of Edmonton

ARCHITECT:
MacLennan Jaunkalns Miller Architects (MJMA) 416-593-6796

ASSOCIATED ARCHITECT: HIP Architects (now Kasian)

STRUCTURAL: Read Jones Christoffersen Engineering 780-452-2325

MECHANICAL & ELECTRICAL: Hemisphere Engineering 780-452-1800

CONSTRUCTION MANAGER: Clark Builders 780-395-3300

INTERIOR DESIGN: MJMA 416-593-6796

STRUCTURAL STEEL SUPPLIERS:
- Collins Industries – Fieldhouse, Eskimos' Office and Team Rooms 780-440-1414
- Whitemud Ironworks – Multi-use Recreational Centre 780-465- 5888

STRUCTURAL STEEL INSTALLER: Clark Builders: 780-395-3300

WALL CLADDING SUPPLIER: Vicwest 905-825-2252

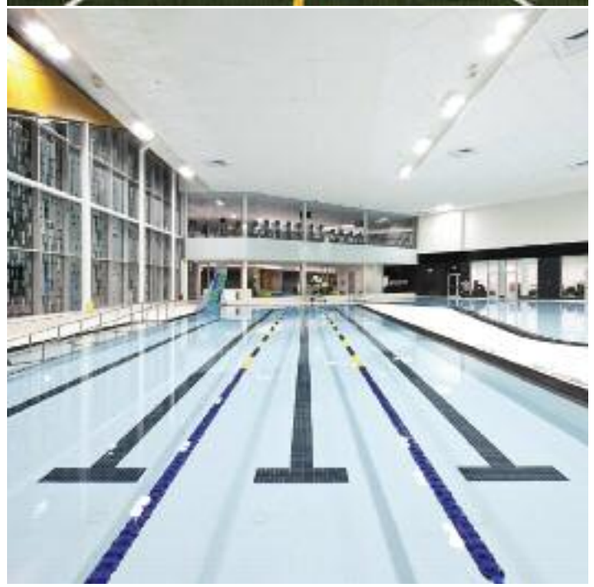
WALL CLADDING INSTALLER: Clark Builders 780-395-3300

PHOTOGRAPHERS:
Tom Arban: see specific photos, page 5
Jim Dobie: Interior of Field House, Pointed Prow, Pool

WALL CLADDING:
Pre-painted AZM275 (G90) galvanized

- Gauge: .91mm (.036")
- Substrate: AZM275 (G90)
- Colour: QC2624 Bright Silver
- Paint system: PVDF / 10,000 SERIES
- Cladding profile: TRADITION 100-4

The choice of steel for the superstructure and cladding for this LEED Silver facility was key in delivering the design excellence and project efficiency called for by Edmonton's civic revitalization mandate.



Photos, top and right: Jim Dobie

CCRC Building Section: MJMA

Steel and the sound of music

The Taylor Performing Arts Centre is music to students' ears at Mount Royal University in Calgary. Designed by Pfeiffer Architecture, construction on the new addition to the school was begun in 2011 and finished in the Fall of 2015. The Centre's crowning glory is the 800-seat Bella Concert Hall, which features a stunning Alberta rose looking over the stage.

The Conservatory features the 800-seat state-of-the-art Concert Hall as the centerpiece. Percussion rooms, public rooms and music classrooms surround the concert hall. Six rehearsal halls, 51 studios, additional classrooms, administration areas, lobby, a back-of-house operations area and a designated wing for the Conservatory's Early Childhood music programs.

"We took the whole idea of the prairies as well as the history of the prairies and communicated it through the language of architecture," says Bill Murray, Principal Architect. "The building was inspired by the geography and geology of the area. It is meant to look like a hierarchy of parts, like you'd see when you're driving through the mountains, with the concert hall as its peak."

Photos: Ema Peter Photography

Murray adds that incorporating history into the design was crucial, as Mount Royal University's one-hundred-year old music conservatory is the oldest of its kind in Canada. "It's about being part of something historic that's expressed in a contemporary way," he says. "People love this space when they walk into it. It is very rich."

"The orchestra canopy, an interesting design element, throws the sound back to the orchestra but it also moves the sound around the room," says Murray. "The acoustics are supreme."

Since the structure's walls are concrete, a significant amount of steel was required to support their weight. Murray describes what he calls a "barn-like" structure of steel inside the concert hall. "A lot of steel was used in both the structure and cladding of this building.

The obvious benefits of pre-painted cladding are time and money. "Pre-painted cladding also allowed the metal seam work to be better defined, which is what we wanted". Quality control is also improved, since the paint is approved before it goes to the site.

Ema Peter Photography

Ema Peter Photography

The Mount Royal University Conservatory and Concert Hall has been designed and constructed to satisfy the energy and environmental requirements of the LEED® Canada for New Construction and Major Renovation 2009 Green Building Rating System. The construction materials were diverted from the landfill whenever possible and achieved a 80% diversion rate.

WALL CLADDING:

PRE-PAINTED STEEL THICKNESS: 0.76mm (.0299")

COATING WEIGHT: Z275 (G90) galvanized

PAINT SYSTEM: Kynar / Weather XL

CLADDING PROFILES: AD300, CL3100, 7/8 CORRUGATED, CL7040

COLOURS: Classic Copper QC9559; Grey Silt QC09653; Aged Metal QC8591B; Charcoal QC6072

DESIGN AND CONSTRUCTION TEAM

OWNER/DEVELOPER: Mount Royal University

ARCHITECT: Pfeiffer Partners Architects 213-624-2775
and Suhari + Partners Architecture Inc. 403-228-9307

STRUCTURAL ENGINEER:
Reed Jones Christoffersen Ltd. 403-283-5073

CIVIL ENGINEER:
Jubilee Engineering Consultants Ltd. 403-276-1001

MEP: H. H. Angus & Associates 416-443-8200

CONSTRUCTION MANAGER:
CANA Construction 403-255-5521

THEATRE: Auerbach Pollock Friedlander
415-329-7528 and 212-764-5653

ACOUSTICS: Talaske 708-524-2800

AUDIO/VISUAL:
Multi-Media Consulting, Inc. 650-578-8591

STRUCTURAL STEEL SUPPLIER:
Glenmore Fabricators 403-203-4976

STEEL CLADDING SUPPLIER:
Vicwest 780-454-4477

STEEL CLADDING INSTALLER:
Skyline Roofing Systems 403-277-0700

LIGHTING:
Francis Krahe & Associates 213-617-0477

LANDSCAPE ARCHITECT: 818 Studio Ltd. 403-244-8188

PHOTOGRAPHY: CANA Construction,
Ema Peter Photography 604-789-6339

The entire building frame is structural steel and the wall cladding is roll-formed pre-painted steel. Steel was chosen for economic reasons and for its relatively light weight," he says. "The shapes we were going after were much easier to achieve with steel, which is what we wanted."

The Taylor Performing Arts Centre is connected to the Centre for Continuous Learning. It was constructed with funding from the federal, provincial and city governments, with the rest of the monies raised from the Taylor family and other private donors.

The Conservatory and Concert Hall has been designed and constructed to satisfy the energy and environmental requirements of the LEED Canada for New Construction and Major Renovation 2009 Green Building Rating System.

Lead architect Bill Murray, devised a design incorporating the structural elements that reflect the rural prairie heritage of Alberta. The massing of the building draws associations to the tectonic forces that created the Rocky Mountains, above the lower forms – metaphorically alludes to the singular barn in the landscape.

This 9,290 m^2 (100,000 sq. ft.) project, completed in the summer of 2015, was designed to achieve future LEED® Gold certification and serves as the beating heart of the Mount Royal University campus. The Conservatory features the 800-seat state-of-the-art Concert Hall as the center piece, six rehearsal halls, 51 studios, additional classrooms, administration areas, lobby, back-of-house operations area as well as a dedicated wing for the Conservatory's Early Childhood music programs.

Ema Peter Photography

Photo: CANA Construction

Pre-painted Galvanized Steel Cladding contributes to re-cladding project

The Victoria Park Transfer Station is a waste drop-off and transfer facility located in North York, Ontario. It is owned by the City of Toronto. Completed in 2017, the re-cladding project rehabilitated nearly the entirety of the building's exterior. Cole Engineering was the prime consultant working with ATA Architects Inc. as the sub-consultant, responsible for the architectural components.

The waste transfer station was built in the 1970s by Inducon Consultants of Canada Limited. The original brick building was constructed without a rain screen cavity. As a result, moisture entering the masonry wall due to rain and/or the migration of moisture in the form of vapour from within, was unable to drain away effectively. When the brick froze in the winter, any pre-existing moisture was unable to escape.

The brick consequently fractured and its outer face spawled off. The masonry damage that had occurred over the years was significant and extensive. To remediate local damage a portion of the building had been previously re-clad in a dark brown siding.

Conservation architects ATA were brought onboard to review and remediate the damage. Simply repairing and replacing the damaged masonry would not have prevented further deterioration as the root cause of the problem (trapped moisture) would not have been remedied. ATA frequently work to retain original materials, but in this instance, it would have been counterproductive.

Instead, ATA re-clad the building in pre-painted steel siding. The building has minimal windows and a substantial area of wall surface to cover. ATA's chosen approach was to use standard industrial-type siding in various profiles and colours to provide contrast and give character to the building.

ATA believed that an extension of the existing dark siding over the building's remaining elevations would make for an oppressive and foreboding appearance. The original design had located windows and vents in vertical strips to break down the massing and provide more visual interest. In the same spirit, ATA retained these elements and used them to break the patterning of the steel siding. To create continuity between the existing and new siding, ATA also incorporated dark brown panels.

The brick was removed to the concrete block wall. Added: Blueskin self-adhered air and vapor barrier membrane, rigid insulation, then fastened Z bars (metal skirt system), then installed steel siding (in horizontal or vertical orientation, depending on the section of the wall). Structural steel was added to the back of block walls more than 9.14m (30 ft.) in height, because the brick was bonded to the block and part of the structure.

A brick screen wall approximately 144.8m (475 ft.) in length and up to 5.73m (18.8 ft.) high separates the station from its immediate neighbour, a commercial plaza to the west. The wall, like the transfer facility itself, had deteriorated significantly over time. It too was constructed at a time when rain screen principles were not commonly applied to masonry. As such, the scope of the architectural work also included its re-construction.

ATA's approach and choice of material resulted in a lower client investment cost with a double win: extending the life of the building and, improving the aesthetics of the building and the streetscape for the users and the neighbourhood.

EAST ELEVATION

DESIGN AND CONSTRUCTION TEAM

OWNER: City of Toronto

ARCHITECT: ATA Architects Inc. 905-849-9686

STRUCTURAL ENGINEERS:
Cole Engineering 905-940-6161

GENERAL CONTRACTOR:
Duron Ontario Ltd. 905-670-1998

WALL CLADDING SUPPLIER:
Vicwest 800-387-7135

WALL CLADDING INSTALLER:
Cladit Siding Solutions Inc. 416-738-9671

PHOTOGRAPHER: Victor Lee

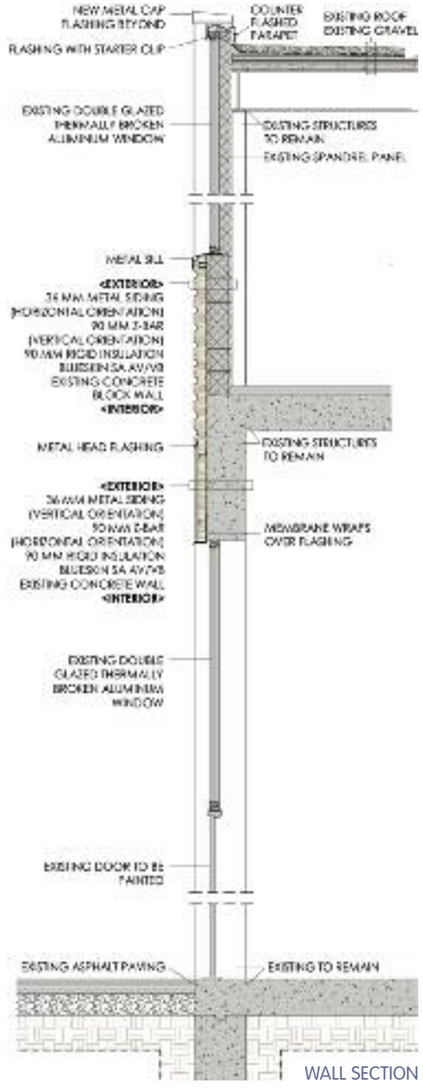
STEEL WALL CLADDING

Pre-painted Z275 (G90) galvanized, with a silicone modified polyester paint system

- Vicwest AD 300R Siding Colour: QC-16082 Regent Grey
- Vicwest CL6025R Siding Colour: QC-16072 Charcoal)
- Vicwest Corrugated Siding Colour: QC-16071 Stone Grey

BRICK

- Brampton Brick Premier Plus size, Red Smooth



WALL SECTION

The original brick building and screen wall, was constructed in the early '70s without a rain screen cavity, which was common at that time. As a result, the moisture entering the masonry wall was unable to escape. This then resulted in fracturing and the outer surface of the brick spawling falling off.

With the root cause of the problem being trapped moisture, simply repairing and replacing the damaged masonry would not have prevented further deterioration.

Typical Wall Section: Brick was removed, Blueskin self-adhered air and vapor barrier membrane and rigid insulation were added. Once Z bars were installed, both vertical and horizontal siding was installed, depending on the location.

ATA's chosen approach was to use standard, industrial-type siding in various profiles and colours to provide contrast and give character to the building.

Pre-Painted Steel Cladding Integral to the North

The new Aquatic Centre in Iqaluit, Nunavut, has revitalized the community and helped to teach another generation of residents how to swim. Joshua Armstrong, architect and Iqaluit office manager for Stantec Architecture in Iqaluit, had his work cut out for him when he was hired to spearhead the project in 2013. The Iqaluit Aquatic Centre was completed in December 2016.

"It's an aquatic centre first with community centre elements and a fitness facility. It's Phase 1 of a long-term plan to increase recreational facilities in the community," he explains. "Since it opened, the response has been overwhelmingly positive. The Centre gets a lot of use."

Stantec's client for the job, the City of Iqaluit, had previously leased a small pool from a developer, but this pool had been closed for four or five years.

"There is a generation of young children who didn't have a community pool, that didn't know how to swim – this facility is changing that in a hurry" says Armstrong. "We got a strong sense from the client that the new Centre needed to be evocative of the landscape and the culture of the community. They wanted it to be a unique facility, there aren't many of these types of buildings in the Arctic."

In addition to the usual challenges of building in such a harsh climate, Armstrong and his team faced another hurdle as well: the proposed site for the new Centre was polluted.

"The site has a history, there used to be a nursing station where this building sits now and their generator had leaked oil which, with other polluting sources, left a brownfield site. Foundations design was critical to addressing permafrost conditions and remediating the site." he says. "We lifted the building up and supported it on steel columns that were pinned to bedrock, leaving a space between the building and the ground to allow for snow passage, to protect the melting of permafrost and to de-pollute the site in a passive way."

In this photo can be seen Agway's .76 mm (.0299") 22mm (7/8") corrugated unpainted AZM150 Galvalume and .76mm (.0299") pre-painted AZM150 Galvalume Hidden Fastener panel, coloured Heron Blue QC6079, along with Vicwest's AZM150 Galvalume pre-contoured 22mm (7/8") corrugated panel for curved surfaces.

Most of the building was constructed of steel, which is prized for its durability and low-maintenance in the north. "On the exterior we used a lot of Galvalume™ coated steel cladding. It's a low-maintenance material proven to be quite good in the north. We have a harsh climate, and the sun and wind are very hard on materials," says Armstrong, adding that they had to take special care with the treatment of the steel. "aquatic centres have high humidity and chemically treated water, which has a corrosive effect on steel if the steel isn't addressed properly."

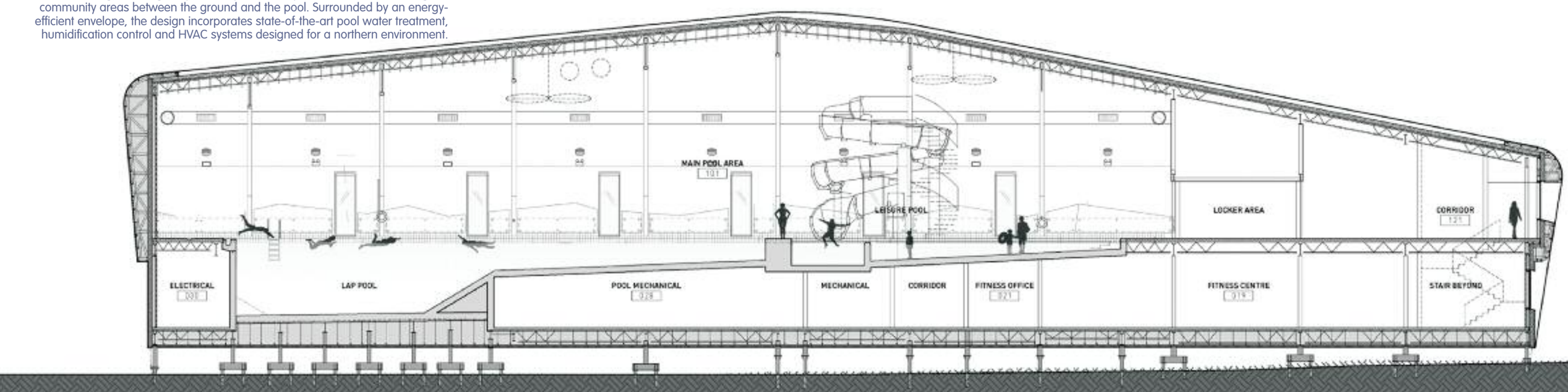
Load-bearing steel studs, rebar, steel decking, with both pre-painted and unpainted AZM150 Galvalume® steel wall cladding and roofing were also used in the construction.

"The most unique thing about the pool is that it's not in the ground. It's on the second floor," Armstrong says. "The pool design is minimalist to evoke the ice forms – we have ice and water here and the two are always intermingling."

Since the community of 7,000 people has three official languages, the team developed a graphic language to use throughout the building to eliminate the need for a lot of text on signage.

"In addition to the exterior, the colour is inside the building. We wanted people to enter a whole new environment when they walked inside," says Armstrong. "It speaks to the unique place that it's in."

With a creative design to an environmentally difficult site, the facility was built on a pile foundation with the pool tanks situated above grade and within the structure of the building, avoiding the potential permafrost problem and sandwiching the community areas between the ground and the pool. Surrounded by an energy-efficient envelope, the design incorporates state-of-the-art pool water treatment, humidification control and HVAC systems designed for a northern environment.



The central vision of the Iqaluit Aquatic Centre was to create a universally accessible space, while promoting healthy and active living and creating a centralized aquatic facility that acts as a hub for Iqaluit's recreational culture.

As with the Nunavut Justice Centre, shown here, in the background, Galvalume steel cladding is an Integral part of the Aquatic Centre's exterior envelope.

Front entrance exhibiting both Agway Metals hidden fastener .76mm (.0299") pre-painted AZM150 Galvalume steel, coloured Heron Blue QC6079 Weather XL as well as Vicwest Steel's pre-contoured 22mm (7/8") corrugated AZM150 Galvalume cladding.

DESIGN AND CONSTRUCTION TEAM

OWNER: City of Iqualuit

ARCHITECT: Stantec Architecture 867-979-0555

STRUCTURAL ENGINEER:
Adjeleian Allen Rubeli (AAR) Limited 613-232-5786

STEEL CLADDING SUPPLIER: Moulures 200 Inc, QC 418-596-2606

CLADDING PRODUCERS: Agway Metals Inc. 800-567-2582
Vicwest 800-567-2582

CLADDING INSTALLER: Kudlik Construction 867-979-116

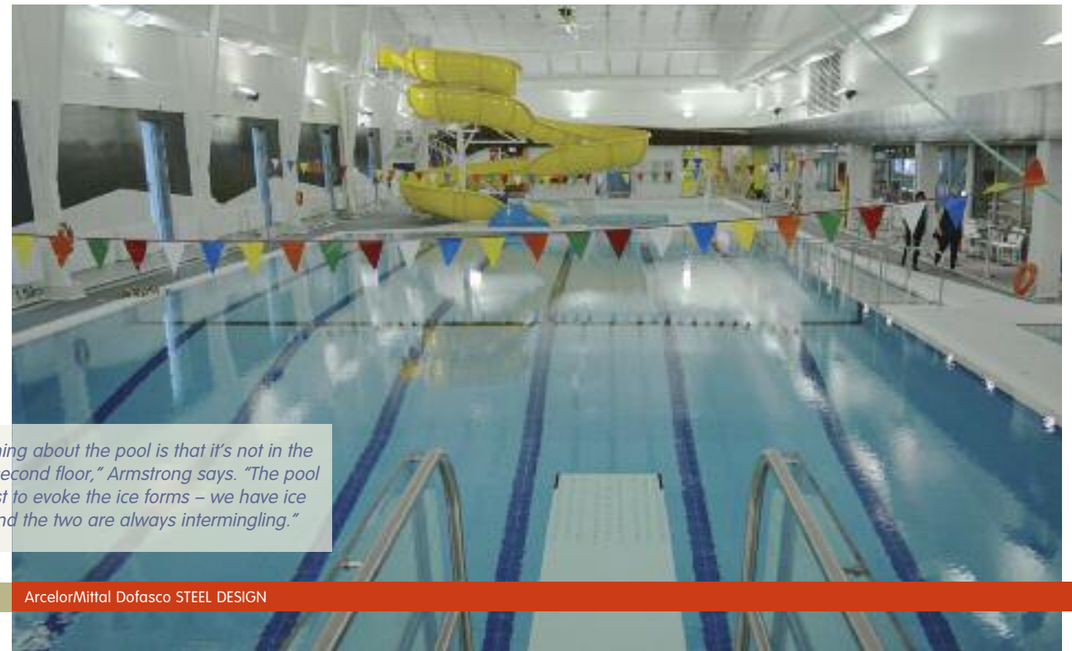
EXTERIOR WALL CLADDING

Agway: 22.2mm (7/8") corrugated, .76 mm (.0299")
AZM150 Galvalume

Agway: Hidden Fastener panel: 305mm x .76mm (12" x .0299")
coloured Heron Blue QC-6079 – Weather XL

Vicwest: Pre-contoured (for curved surfaces):
AZM150 Galvalume for the roof
thickness: 0.76mm. (.0299")

STEEL DECK: Deck typically 965mm x .76mm (38" x.0299")



"The most unique thing about the pool is that it's not in the ground. It's on the second floor," Armstrong says. "The pool design is minimalist to evoke the ice forms – we have ice and water here and the two are always intermingling."

Real Steel Cost Advantages – Consider. Choose. Challenge.

Start at the foundation where the loads imposed by a steel frame are up to 50% less than those of a concrete alternative. There is evidence in the field and through third-party case studies and comparative cost studies that steel building systems offer significant cost benefits over competitive building materials when the total cost of construction is considered.

There is evidence in the field and through third-party case studies and comparative cost studies that steel building systems offer significant cost benefits over competitive building materials when the total cost of construction is considered. Building owners, developers, contractors and design professionals are concerned with overall system construction costs from the design phase through the operational phase, and not simply the raw material costs of structural and non-structural systems. While there are efforts to promote the affordability of a specific building material over others, there is a growing concern that the overall impact of material selection is being ignored or concealed, a result that will be costly for all stakeholders involved. It would be wise for developers, designers, building professionals, owners and other stakeholders to consider the case for steel and its many proven or

demonstrated cost advantages such as long-term performance, choose the best material for the building project based on all direct and indirect economic benefits, and challenge the claims of competing materials industries.

- A recent comprehensive comparative case study[1] on a six-storey office building was conducted by respected third parties in order to evaluate the impact of using steel framing versus cast-in-place (CIP) concrete on a project's entire construction cycle from concept and design to costing, construction and sustainability. The result was a net cost difference of $81/m² ($7.50/sq. ft.)[2] in favour of the steel building.
- Cost savings in steel buildings start at the foundations, where the loads imposed by a steel frame are up to 50% less than those of a concrete alternative[2].
- Time-related savings can easily amount to between 3% and 5% of the overall project value[3], reducing the building owner's requirements for working capital and improving cash flow.

"We supplied all the cold formed steel and connectors. We had 95% pre-cut to size to save labour and site debris. The steel's precision and straightness allowed the use of pre-engineered panels. We estimate close to a $10.00 per 0.093m² ($10.00 per sq. ft.) savings over a concrete structure".

Gerry Morin, Morin Bros. Building Supplies Inc.

Builders risk insurance on a four-storey, 400-unit hotel, built over 24 months, cost $360,000 for steel framing, compared with the $1.6 million it would have cost for a policy if the project had been built with wood – a saving of $1.3 million[4].

[1] CISC Comparative Case Study: Steel vs Concrete Framing Systems
[2] SteelConstruction.info The free encyclopedia for UK steel construction information, http://www.steelconstruction.info/The_case_for_steel
[3] SteelConstruction.info The free encyclopedia for UK steel construction information, http://www.steelconstruction.info/The_case_for_steel
[4] SFIA, "Insurance Savings with Cold-Formed Steel"

Steel is durable, safe, and strong. It is not susceptible to rot, termites, or mold. Steel used for framing will last from hundreds to over a thousand years due to its zinc coating, a natural element. Steel structures require less material (both reduced weight and reduced volume) to carry the same loads as concrete or masonry or wood structures.

UltraBond Floor System speeds up Apartment Building Construction

A composite floor system shortened construction time by three months and cut material costs, for an 11-storey, 166-condo unit apartment building in Longueuil Quebec. The system, called UltraBond, comes in cold-form sheets 609.6mm (24 inches) wide, 203mm (8") high and precut in lengths up to 10.06m (33 ft.), according to Simon Pawsey, technical sales representative with the Steelform Group of Companies.

Once assembled into floor decking and with rebar placed in the deep V-grooves, concrete is poured on the Ultra-Bond, creating a lightweight composite floor 292mm (11.5") thick. Once finished, it has a two-hour fire rating. Pawsey checks off some of the advantages of this construction technique:

"UltraBond significantly reduced weight on the structure compared to a conventional slab. It reduced shoring to one row. Cost savings were a big factor, with one-third of the rebar and 50 percent less concrete than a nine-inch slab. It saved the general contractor about three months of construction time."

The UltraBond used in the structure, including the balconies, was 1.22mm (.048") Z275 (G90) galvanized steel. The contractor used 13,066m² (140,000 sq. ft.) of UltraBond deck, weighing about 226,796 Kg (500,000 pounds). Because of the lighter weight, less shoring is required.

UltraBond was also used to build the balcony floors.

All images courtesy: Steelform Group

Innovative, urban and dynamic, this 11-storey residential tower is located adjacent to the terminal Longueuil and the University of Sherbrooke.

LIGHT STEEL FRAMING:

G60 galvanized 1.22mm to 2.74mm (.048" to .108")

Actual dimensions of the LSF supplied 152.4mm (6") studs

UltraBond – Z275 (G90) galvanized 1.22mm (.048")

Axcès Saint-Charles in Longueuil, Québec, built with the UltraBond composite floor system and light steel framing. Rebar creates reinforced beams in the UltraBond composite floors, using 22mm (.048") Z275 (G90) galvanized steel.

UltraBond steel deck, rebar, mesh and concrete form a composite floor that is lighter than conventional concrete floor construction.

DESIGN AND CONSTRUCTION TEAM

CLIENT: Habitations Trigone 450-446-8221

STEEL BUILDING SYSTEM SUPPLIER: Steelform Group of Companies 514-210-0903

ARCHITECT AND PROJECT MANAGER: Atelier Urban Face 514-931-9168

STRUCTURAL ENGINEER: CPF Groupe Conseils 514-667-5450

STEEL STUD SUPPLIER: Produits de Bâtiment Fusion 450-728-4500

STEEL ERECTION: Les Installations Miral 450-492-5952

BUILDER: Habitations Trigone 450-446-8221

PHOTOGRAPHY: Simon Pawsey 514-210-0903

ArcelorMittal

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