ArcelorMittal

steeldesign

FALL 2019 | VOLUME 51 | NO. 2

steeldesign

FALL 2019 | VOLUME 51 | NO. 2

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

We are announcing our move to electronic publishing beginning in Spring 2020. If you wish to continue receiving *Steel Design* or *Construction Métallique* electronically, please contact us with your name, title, company name and email address at: customer-inquiries@arcelormittal.com

Steel Design is published by ArcelorMittal as a service to architects, engineers, specifiers, building officials, contractors and others involved in the building design and construction fields. Starting in 2020 *Steel Design* will be published electronically, is free of charge and is available in English and French. Material may be reprinted either in part or in full, provided an acknowledgment is made to to *Steel Design*.

100% recycled, 10% post-consumer paper, Acid-free

Canadian Publications Mail Agreement Number PM 412285518

COVER PHOTO:
Terrace Sportsplex, Terrace, British Columbia
PHOTOGRAPHER: Matthew Halverson

Correction to Wolfville Memorial Library article in *Steel Design*, Spring 2019

The Graphite Gray diamond shaped roof tiles used to replace the roof on the Library were manufactured and supplied by Diamond Steel Roofing Systems in Wingham, Ontario.
1-888-810-7663 www.diamondsteelroof.ca

IN | THIS | ISSUE

Important Announcement for *Steel Design* Readers

We are announcing our move to electronic publishing beginning in Spring 2020. Please contact us to receive *Steel Design* electronically with your name, title, company name and email address at: customer-inquiries@arcelormittal.com

To view the current issue of *Steel Design* on-line, visit us at: dofasco.arcelormittal.com/what-we-do/architects-corner.aspx

Steel plays a significant role in the Renewal and New Construction

of Terrace Sportsplex and Vanderhoof Aquatic Centre

Steel design has played a vital role in structures intended to revitalize their communities. The architects designed practical solutions to twinning the existing arena as the first step in the Terrace Sportsplex Project Revitalization. A pre-engineered steel building by Behlen Industries was used for the second arena, which provides an important training ice surface for hockey-crazy Terrace.

Through careful budget planning, interior improvements were made to the existing arena and Sportsplex. These improvements focused on improving spatial flow, both in the first and second floor entrance ways and in some exterior improvements, including replacing wood cladding. The project is strongly characterized by a cantilevered multipurpose space, designed to take advantage of Terrace's impressive mountain views. The second floor addition provides a canopy over the entrance, much needed community-use space, as well as warm, second floor viewing areas for both ice sheets.

Subsequently, Carscadden Stokes McDonald worked with the City of Terrace to complete a full review and assessment of the Aquatic Centre located in the same campus of facilities as the Sportsplex. In regard to the

"Pre-painted steel is an elegant material to work with. It is durable, low maintenance, colourfast and it comes in a number of profiles we like, plus it's a delight to work with." said Ian McDonald, partner architect.

Vanderhoof Aquatic Centre, a whole new facility was built, replacing the old aquatic facility.

Armen Mamourian, principal architect with Carscadden Stokes McDonald Architects Inc., explains the revitalization at the Sportsplex, "the community of Terrace had hoped to twin their existing ice sheet at the Sportsplex to meet growing demand". Armen continues, "earlier attempts were coming in over budget, so this new design exploited steel structures in general and stressed skin-steel buildings in particular, to meet the demands for long spans, durable surfaces, and simple foundations," he says.

A Convex frameless steel building system, by Behlen Industries was used in the Terrace Sportsplex Revitalization for the second ice surface. This steel building system (SBS) approach was chosen for its ease of constructability, spread footings and serviceable interiors. Additionally, the frameless approach provided clean and clear interiors with natural ceilings. The stressed-skin steel building addition mimicked the form of the existing roof, while providing a practical, modern solution. The exterior cladding of the second arena is clad with AZM180 Galvalume coated steel.

Meanwhile, in Vanderhoof, building a local aquatic facility had been a community aspiration for years. The district undertook extensive public consultation and a successful referendum to determine the type of facility which would add value to the local area as well as gaining access to the funds required to bring the project to reality.

The project is strongly characterized by a cantilevered multipurpose space, designed to take advantage of Terrace's impressive mountain views.

"Again, while there was a strong desire to showcase wood elements, as the forestry industry is a big local presence, the budgetary considerations and large spaces unimpeded by structural elements led us to an elegant steel framed building solution," says Mamourian. "The construction of the new aquatic facility is intended to promote public health and year-round activity for the town's residents. It is located next to the existing ice arena in the centre of town to create a convenient and accessible athletics precinct." While a pre-engineered steel building was used for the Terrace Sportsplex revitalization, steel framing and steel roof deck along with steel roof cladding was used for the Vanderhoof Aquatic Centre. Wood has been used in the building's interior finishes in a nod to the local forestry industry.

The structural steel roof of the Vanderhoof Aquatic Centre is a striking focal point, McDonald says. "I think it's quite shapely. The design was meant to evoke the landform of the surrounding topography. The crinkled and folded roof is pretty dramatic."

The Sportsplex revitalization was completed in December 2018 and the Vanderhoof Aquatic Centre in January 2019.

TERRACE SPORTSPLEX:
Dark Red 56064 and unpainted Galvalume AZM180.

TERRACE AQUATIC CENTRE – FITNESS ROOM:
Cladding – .61mm (.0239") 1.2mm (½") corrugated AZM180 Galvalume.

TERRACE 2nd ARENA – FRAMELESS CONVEX STEEL BUILDING SYSTEM
- UNPAINTED CLADDING: .61mm (.0239") AZM 180 Galvalume horizontal cladding, Ultra Span profile.
- PRE-PAINTED CLADDING: 1.22mm (.048") AZM 180 Galvalume coated steel cladding, coloured Black, CS75 panel.
- ROOF PANEL: Unpainted Z275 (G90) CS75 panel.

VANDERHOOF AQUATIC CENTRE
- STEEL ROOF DECK: Z275 (G90) galvanized.
- STRUCTURAL FRAMING: Wide flange beams, steel trusses, HSS sections and pipe sections were used in the framing of the building.
- ROOF CLADDING: AR5150-NS 38mm (1.5") Snap Lock hidden fastener roof panel, Z275 (G90) galvanized.

DESIGN AND CONSTRUCTION TEAM – TERRACE SPORTSPLEX REVITALIZATION:

ARCHITECT:
Carscadden Stokes McDonald Architects Inc. 604-633-1830

STRUCTURAL ENGINEERS:
CWMM Consulting Engineers Ltd. 604-731-6584

GENERAL CONTRACTOR:
Viking Construction Ltd. 250-562-5424

STEEL WALL CLADDING SUPPLIER – FITNESS ROOM ADDITION: Vicwest 800-387-7135

STEEL CLADDING INSTALLER – FITNESS ROOM ADDITION:
101 Industries Ltd. 1-877-632-6859

STEEL BUILDING SYSTEM MANUFACTURER – 2nd ICE RINK:
Behlen Industries 204-728-1188

STEEL BUILDING SUPPLIER:
Colony Management Inc. 604-688-2604

PHOTOGRAPHER: Matthew Halverson 604-873-7848

DESIGN AND CONSTRUCTION TEAM – VANDERHOOF AQUATIC CENTRE:

ARCHITECT:
Carscadden Stokes McDonald Architects Inc. 604-633-1830

STRUCTURAL ENGINEERS:
CWMM Consulting Engineers Ltd. 604-731-6584

GENERAL CONTRACTOR:
Grayback Construction Ltd. 250-493-7972

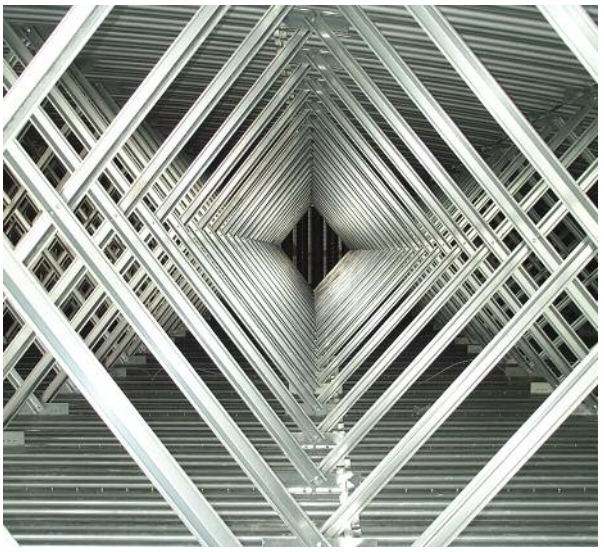
STRUCTURAL STEEL SUPPLIER:
North Arm Machine Ltd. 604-526-2673

STEEL ROOF DECK SUPPLIER:
North Arm Machine Ltd. 604-526-2673

STEEL ROOF CLADDING SUPPLIER:
Westform Metals 604-858-7134

STEEL ROOF CLADDING INSTALLER:
Admiral Roofing & Wall Systems Ltd. 250-561-1230

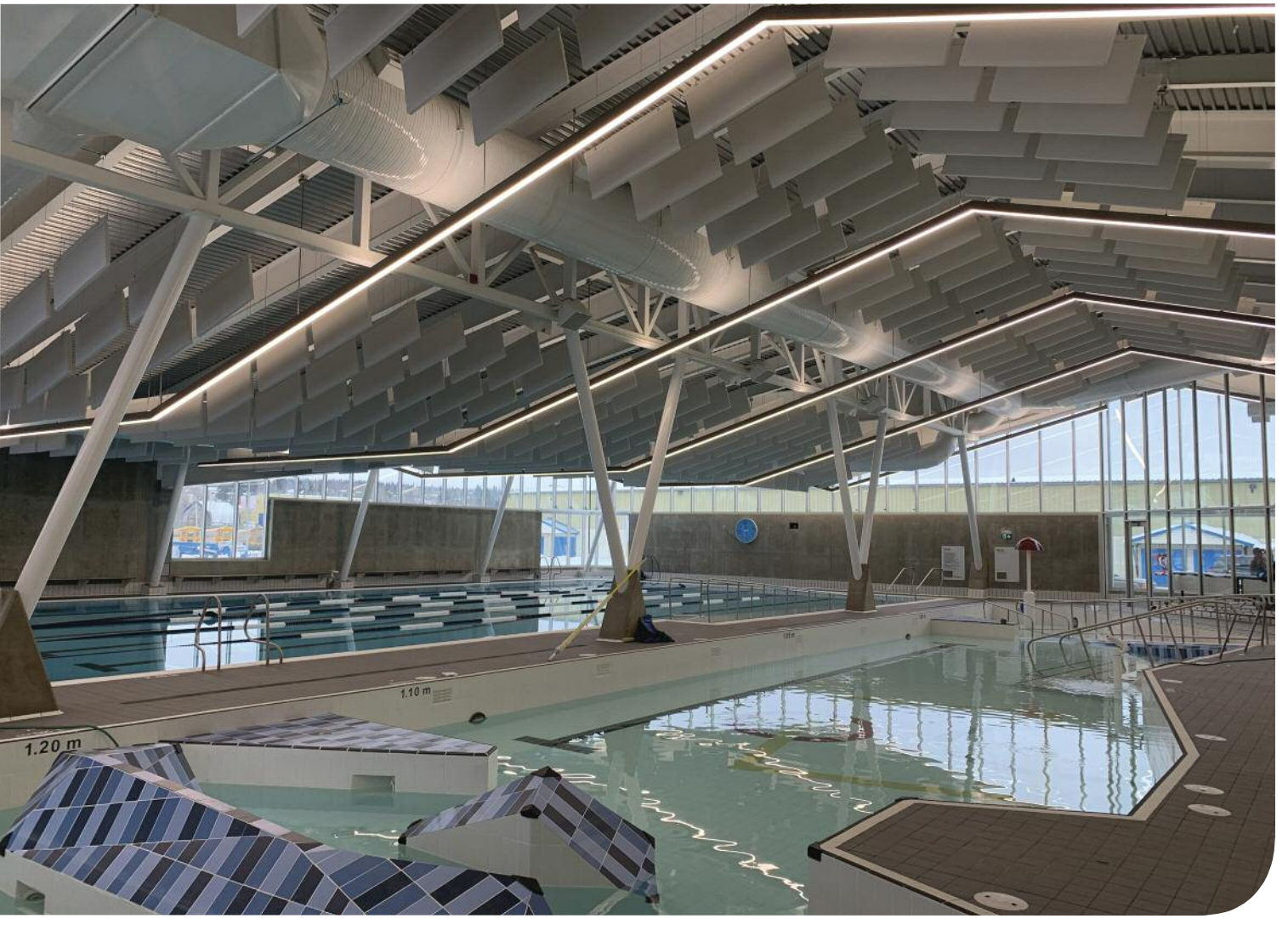
PHOTOGRAPHER: Armen Mamourian 604-633-1830



Above: Attic trusses can be designed for varying loads by changing the gauge. This allows the roof system to accommodate heavy loading capacity.

Budgetary considerations and large spaces, unimpeded by structural elements, led us to an elegant steel framed building solution for the Vanderhoof Aquatic Centre," says Mamourian. The photo below shows the extensive use of wide flange beams, hollow structural sections (HSS), steel roof deck and structural steel pipe.

Below: Unpainted .61mm (.0239") AZM180 Galvalume in the Ultra Span profile along with 1.22mm (.048") AZM180 Galvalume, coloured Black in the CS75 profile, can be seen on the end of the Frameless Convex steel building system of the 2nd Terrace Arena.



Providing Solutions in Steel™ through ArcelorMittal Dofasco BIM objects for Prepainted Steel

Building information modelling (BIM) digitally integrates the aesthetic design and technical details of a construction project into one information package. BIM gives everyone involved in the construction process a digital prototype of the building before it is built. BIM follows the same model used to design aircraft and ships, where all relevant information is integrated into a single tool.

Access our BIM objects at Architect's Corner by ArcelorMittal.

Building owners, government agencies, engineers and end users can all see how the construction will look and how it can be utilized. Design changes can be incorporated at a very early stage of the project which reduces cost and the chance of delays.

The use of BIM has been growing rapidly in the last decade. In the NBS International BIM Survey 2016, 67% of Canadian respondents were aware of and currently using BIM, with 86% expecting to use BIM within a one to three year timeframe.

Every construction material used in the completion of the building is described in a BIM 'object'. BIM objects from ArcelorMittal Dofasco can be found for all published paint series on our Architect's Corner web site. While colour for 3D renderings for different types of buildings is the primary objective, texture and sparkle for specialty paint series such as Granite® Deep Mat and Perspectra Metallics™ are featured. Quality and Performance information is also available for each paint series.

When combined with building panel objects (architectural profiles, IMP panels, roofing tiles), a steel envelope solution is provided to engineers and architects.

Above are two views with different zoom factors of the full building rendering shown at left, representing different paint series and colours on the external elevation.

Image 1
Full Building Rendering: Representation of Perspectra Metallics Silver QC10400.

Image 2
Close-Up Rendering: representation of 10000 Series
Metro Brown QC196.

Image 3
Close-Up Rendering: representation of Perspectra Plus
Bright White QC28783.

Community boasts net-zero energy with the help of sleek Pre-painted Galvalume Steel Exterior

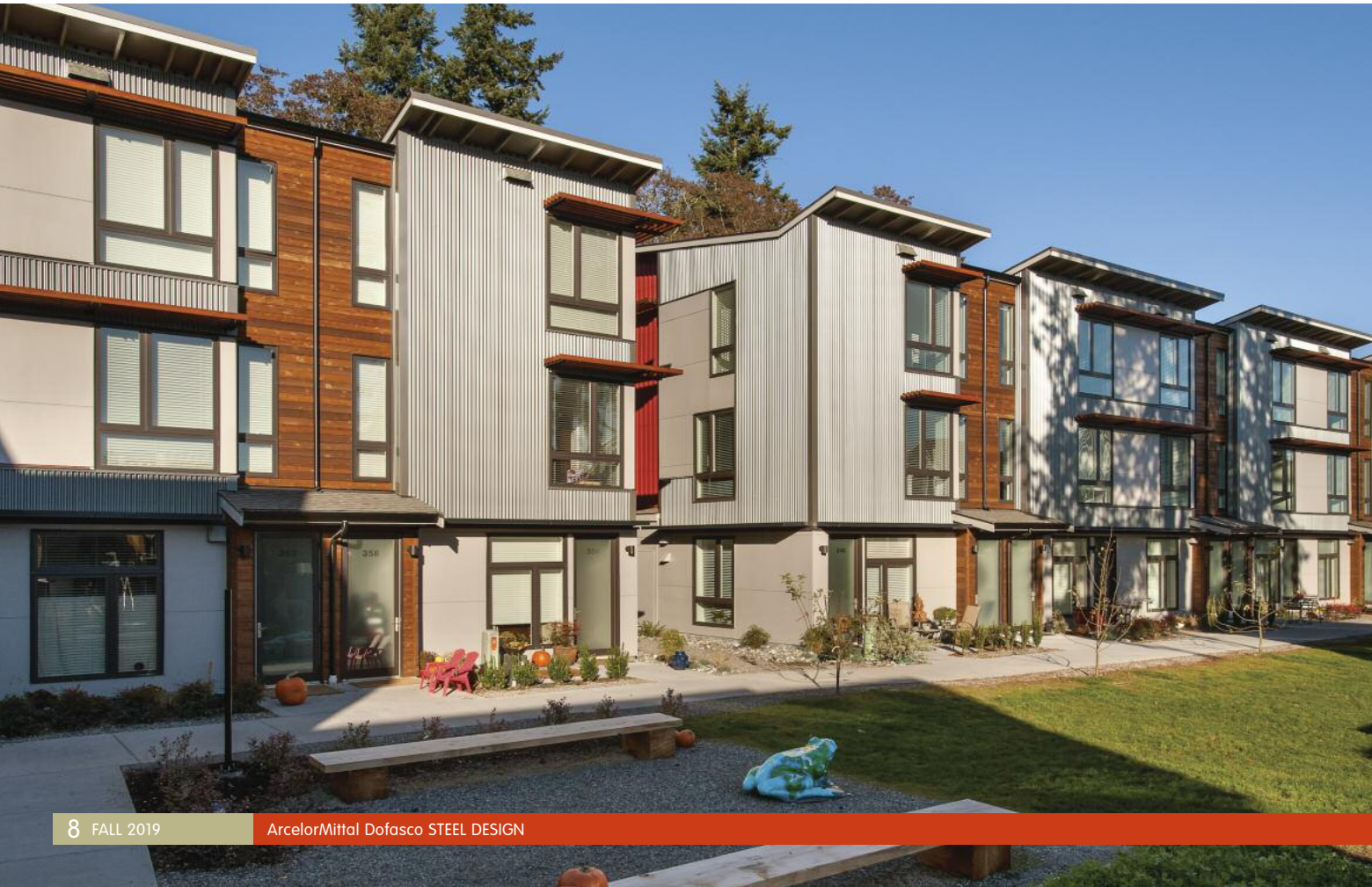
The healthy homes of Grow Community, an urban neighborhood on Bainbridge Island, just a 35-minute ferry ride from Seattle, Washington. The project combines private cottages, townhomes and lofts available for purchase, along with rental flats and townhomes, with a total of 131 housing units on 2.2 hectares (5 acres). Homes are clustered in 'pocket neighborhoods' around pea patches and outdoor gathering areas.

Unique, sustainable and energy-efficient homes are built to ambitious green building standards.

Grow Community is a development that appeals to individuals and families looking to enrich their lives with environmental responsibility, while reaping the benefits of a high-quality, healthy lifestyle. Residents of this community boast zero carbon footprints and use sustainable transport, water, food and materials on a daily basis.

Phase I of the Grow Community project began as a community building experience and this evolved into the first endorsed One Planet Living Community in the United States (5th in the world), where every residential home lives within the resources of the planet. Grow Community's first completed neighborhood is not only powered by a photovoltaic system employing roof mounted solar panels, but it also includes net-zero energy homes. The project team needed to match the innovative and eco-friendly environment of the Village with equally sustainable materials to achieve the desired outcome.

More than 1,115m^2 (12,000 sq. ft.) of pre-painted .61mm (7/8") Corrugated AZ50 (AZM150 in Canada) Galvalume® steel Wall Panels coloured Mistique Plus in the Kynar 500



Grow Community appeals to individuals and families who want to enrich their lives with environmental responsibility, while reaping the benefits of a high-quality, healthy lifestyle. Residents of this community boast zero carbon footprints and use sustainable transport, water, food and materials on a daily basis.

paint system, clad the exterior walls of each home in the Village. Steel cladding met Grow Community's sustainability goals because the panels have a long life span, are 100% recyclable and contain a high percentage of recycled material contributing to sustainable building goals, such as LEED.

All standard panel colours are ENERGY STAR® listed and can improve the energy efficiency of a building. "We knew we wanted to design with corrugated steel because it is a low-maintenance, cost-effective, lifetime material", says Jonathan Davis. He adds, "it's a perfect sustainable option, high quality product, with excellent design assistance.

Sustainability fuels Grow Community, the design teams goal was to insure that the project met or exceeded LEED goals. "Steel cladding is installed on my own home and I have always been impressed with both its longevity and its beauty," adds Davis.

DESIGN AND CONSTRUCTION TEAM

ARCHITECT: Davis Studio Architecture + Design 206-842-5543

DEVELOPER: Asani 206-780-8898

GENERAL CONTRACTOR:
PHC Construction, Bainbridge Island 206-780-4060

STEEL CLADDING SUPPLIER:
Metal Sales Manufacturing Corporation 800-431-3470

PHOTOGRAPHY: Grow Community; Davis Studio; Metal Sales

Steligence®: The Intelligent Construction Choice

Steel has long been integrated into building construction and recognized as a significant material in traditional and modern building design. Steligence® is a research initiative delivering a range of fact based sustainability and cost benefits to architects, engineers, urban planners, real estate developers and construction contractors. Each benefit is individually attractive; together, they create a compelling argument for the use of steel products in construction.

In the case study presented here, a mid-rise office building in the GTA area was virtually designed using steel component construction and contrasted against concrete construction. The functionality of the building did not change; identical use, occupants, size, geographic location were critical in ensuring a responsible comparison.

Life Cycle Assessments of the design scenarios were conducted using the ArcelorMittal Steligence® Life Cycle Analysis application tool, winner of the world steel association's award for 'Excellence in Life Cycle Assessment', at the 9th annual Steelie Awards in 2018. This award recognizes the best use of life cycle thinking for overall environmental improvement in marketing and/or regulatory influence, project application, and new product development. Cost benefits of the steel component design were obtained from Order of Magnitude

WHAT IS Steligence®?

Steligence® is a global initiative by ArcelorMittal using scientific evidence to show the benefits of steel design in building construction. Using a holistic analysis concept, competitive steel building solutions are identified.

WHY Steligence®?

Steligence® allows building owners, architects and engineers a fact based approach to view building construction, for collaboration to build sustainable, more cost-effective buildings.

Estimates by Altus Expert Services, a leading provider of construction cost planning services.

One of the leading key benefits for steel component construction is reduced weight of the building. Weight reduction is significant, as it can influence both sustainability and cost factors. In our virtual office building, the steel solution was 48% lighter than the concrete construction. This reduced weight led to a 27% cost savings for the building foundations and contributed to multiple environmental impact reductions. In addition to the foundation savings, cost savings were also realized for the roof system, with 51% cost savings using a steel roof deck over a cast-in-place concrete roof deck.

Similarly, a composite steel floor deck is 30% more cost effective than cast-in-place concrete. When considering the virtual buildings from a holistic view, encompassing the substructure, superstructure, façade, roof, interior and services, 9% overall cost savings were achieved with our steel design.

Reduction of embodied carbon in buildings, which includes the emissions associated with extraction of raw materials, component manufacturing, transportation and construction site processes, is increasingly important as building operational emissions are reduced. As buildings become increasingly energy efficient, as regions move to low carbon electricity grids, the reduction of embodied carbon can help achieve shorter term emissions reduction targets. In our virtual office building, a 36% reduction in embodied carbon was achieved with the steel component construction. A similar effect was found for other embodied resources, with a 32% reduction in embodied energy consumption and 60% reduction in embodied water consumption.

By using a holistic approach to building construction, Steligence® is allowing us to demonstrate the cost effectiveness and sustainability inherent in steel products for building construction.

ArcelorMittal Project Team: 1-800-363-2726

HAMILTON R&D: Karen Bell, Project Leader

HAMILTON R&D: Kamran Derayeh, Principal Projects Manager

HAMILTON R&D: Stan Lipkowski, Projects Manager

HAMILTON R&D: Jacob Rouw, Projects Manager

GLOBAL R&D: Frédéric Delcuve
Portfolio Director Construction Applications

CRM GROUP:
José Humberto Matias de Paula Filho
Project Leader Building & Structure

CONSULTANTS:

PROJECT ADVISORY:
Tim Smith, MPa Consulting, Oakville 416-317-0670

ARCHITECTURAL DESIGN:
Adamson Associates Architects, Toronto 416-967-1500

STRUCTURAL ENGINEERING:
RJC Engineers, Toronto 416-977-5335

COST CONSULTING: Altus Expert Services, Toronto 416-641-9500

The virtual building was designed with a central concrete core containing elevators, egress stairways, washrooms, floor mechanical unit, electrical and communication rooms. The structure is steel with composite floor decking and steel roof decking with PMR system. The exterior is clad with a mix of curtain wall and steel panel systems. For the contrasted concrete construction, cast in place reinforced concrete slabs and cast in place reinforced columns were used in the design, with precast exterior walls replacing the steel panel systems.

Saskatoon Civic Operations Centre
Steel Provides Energy Efficient Envelope

The impressive Saskatoon Civic Operations Centre is a LEED certified facility that serves as the home of Saskatoon Transit and the city's first snow management location. The transit facility is 41,805m² (450,000 sq. ft.) and has indoor storage for 224 buses. The snow management facility is situated on a 5.67 hectares (14 acre) concrete pad with the capacity to store up to 1,000,000m³ (35 million cubic feet) of snow.

"The City of Saskatoon wanted an innovative program on a site that they had attained," said Gerry Garvin the Senior Contract Administrator in an interview with ***Steel Design*** magazine. "It is bounded on one side by the CN rail line and railyards, so it's a fairly linear site and bus movement is paramount in moving vehicles out in the morning and midday and then bringing them back between crucial periods of bus service." The city has proposed Phase II for this site – the objective being to promote cooperation and coordination between services, facilitate the sharing of resources as well as improve operational efficiency.

Garvin added that the project took roughly three years to complete. "We commenced in January 2014 and we turned the project over to the client in November of 2016."

Steel was a main component in the construction materials for this project because it was a material that was versatile

The SCOC exterior responds to the City of Saskatoon's principles of quality, durability, security, maintainability and accessibility while considering the contextual balance between Saskatoon's rural and urban environments. Both the Brownstone and Sandstone paint colours on the exterior envelope have a Kynar finish, as it helps protect the paint from fading due to elements such as UV rays.

DESIGN AND CONSTRUCTION TEAM

BUILDING OWNER: City of Saskatoon

ITS CONSORTIUM

CONTRACTOR: Ellis Don 306-343-2022

ARCHITECT: Kasian Architecture 403-513-5636

CAPITAL MANAGEMENT: Fengate Capital Management 416-488-4184

CONSULTANTS

MECHANICAL ENGINEER:
Maintenance Design Group 720-473-5904

STRUCTURAL: Stephenson Engineering (Ontario) 416-635-9970 x 141

MECHANICAL: TMP Consulting Engineers 416-499-8000 x 473

ELECTRICAL ENGINEER: Applied Engineering Solutions 604-695-2722

CIVIL: Parsons 403-351-6215

ENERGY MODELER: MMM Group 403-269-7440 x 4629

CODE: D Code 306-260-7833

ACOUSTICS, NOISE VIBRATION: FFA Acoustics 403-508-4996

HARDWARE: CP Distributors 306-242-3315

STEEL CLADDING SUPPLIER: Metl-Span 587-987-2150
Vicwest 306-230-8211

STEEL CLADDING INSTALLER: Thermo Design Insulation 306-241-8417

STRUCTURAL STEEL SUPPLIER: Steelcon Fabrication Inc. 416-798-3343

PHOTOGRAPHY: Kristopher Grunert 1-877-574-7478

enough to use for the designs. "Steel allowed us to provide bigger bays for bus movement, it just makes it easier to move the buses around the facility," said Garvin. "Then, with the increased height which was required both in the storage area and in the maintenance areas, steel was just a more viable product."

So what makes the materials used for the operations centre so effective? ***Steel Design*** magazine reached out to Geoff Searle, the Western Canadian Sales and Marketing Manager for Metl-Span, the manufacturers of the insulated metal panels used for the projects exterior envelope. "The main advantage to using the insulated panel, especially in the cold prairie climate, is efficiency," said Searle. "You can put up a very thin panel that will give you an effective R-Value of over 22."

Searle added that these 1,066.8mm (42-inch) wide, by

The Transit Civic Operations Facility has room to store and maintain 224 City buses, inside, with capacity for future fleet growth. Among the features are administrative offices, wash lanes, inspections pits, fare collection, fuelling, and maintenance bays.

Improving cooperation and coordination between services. The project was completed two weeks ahead of schedule and on budget. It is expected to deliver value for taxpayer dollars equivalent to $92.3 million over the life cycle of the facility.

76.2mm (3") thick, panels could be used for hoarding so the contractor can work throughout the year and when the building is done you still have the efficiency against the elements that it provides. The majority of the panels were 11.6m (38') in length with some of them closer to 12.5m (41').

For the exterior face of the insulated steel panels .61mm (.0239") pre-painted G-90 galvanized steel was used and .45mm (.0179") pre-painted G90 galvanized was used on the interior surface.

For the exterior coating two colours were used. The darker colour is the Brownstone and the lighter is Sandstone," said Searle. He added that both had a Kynar finish as it helps protect the paint from fading due to elements such as UV rays. The interior is Igloo White, which is a polyester finish and does not have the clear coat on it, as it is not needed.

"At the very front of the building, where the office is, we used an actual blue cladding system. The remainder of the building is all insulated panels." said Searle. Searle is a big supporter for insulated panels, for many reasons, one being the environment. "Even though we are using polyurethane, which is obviously a petroleum-based insulation, the insulation value of that product is the best bang for your buck," he said. "In other words you are getting an R-value of 7.3 per one inch of thickness. Metl-Span has been in business since 1968 and we have panels that were made in 1968 that are still standing on buildings today."

Saskatoon Civic Operations Centre is a LEED certified facility, that serves as the home of Saskatoon Transit and the city's first snow management location.

The Centre Sportif Marc-Simoneau is evocative of glaciers and ice

Pre-painted Z275 (G90) galvanized steel assists in ensuring perfect architectural integration. When the snow is piled up against its white, multi-faceted exterior, the Marc-Simoneau sports complex looks like an ice crystal, a chunk of glacier imbedded in the ground. The morphology of the main entrance results from an idea referring to the physical phenomena of glaciation and crystallization of water.

The volumetry of this complex suggests a jagged-shaped glacier, a fragmented snow block reflecting sunlight, a piece of frosted and translucent ice in the northern environment," says Yan Laplante, associate architect with CCM2 Architects.

The building's interior space is 18,725m² (201,554 sq. ft.). The roof structure is composed mainly of steel trusses with 82m (269') spans, spaced at 5.6m (1.7') intervals on centre and supported by steel beams. The building has a 15,175m² (163,342 sq ft.) footprint.

The exterior is clad with 5,090m² (54,788 sq. ft.) of .45mm (.0176") pre-painted Z275 (G90) galvanized steel, coloured QC28317 White. The exterior cladding is .914mm (36") wide panels in the Laurentian profile by Ideal Roofing. The colour, combined with the dramatic arrangement of wall facets, clearly

The whole structure is extremely light, even considering the load consisting of the snow in winter, which is considerable in the region concerned. Lightness is also a feature of the thickness of the outside walls, made of 45mm (.0176") pre-painted Z275 (G90) galvanized steel coloured QC28317 White, both inside and outside. The cladding profile is the 914mm (36") wide Laurentian panels. The 250 mm (9.84") of thickness between the two layers are filled with suitable insulating material for the low local temperatures.

"The morphology of the main entrance results from an idea referring to the physical phenomena of glaciation and crystallization of water. The volumetry suggests a broken-shaped glacier, a fragmented snow block reflecting sunlight, a piece of frosted and translucent ice in the northern environment."

Yan Laplante, associate architect with CCM2 Architects

fulfils the architectural vision. On the practical side, says Laplante of the cladding, "The use of pre-painted steel made it possible to respect the budgets established for the project."

In a wonderful juxtaposition to the cool that the exterior evokes, sunlight pours through the approximately 1,110m² (11,948 sq. ft.) worth of windows. "Unlike existing sports complexes, this one opens on the outside by maximizing the views of the immediate environment from the common areas," Laplante explains. "In the evening, the complex becomes a lantern, the hall lights up entirely, the light spreads on translucent and clear surfaces showing the movements of users and the movement of shadows on the glass walls and on the outside floor. The complex comes alive with the presence of occupants, the rhythms of the seasons and activities."

CLADDING: 0.66mm (.026") Z275 (G90) pre-painted galvanized steel coloured QC 28317 White

CLADDING PROFILE: Laurentian 914mm (36")

The overall volume of the complex, suggests glaciation, crystallization, evaporation, transparency, solidity, ice, snow, frost, water in all its physical states served as a catalyst for the architectural concept.

The architectural design provides a simple volume for sports activities, soccer and ice rinks, unified by a distinctive volume, the main entrance, including the common hall, a multifunctional room, administrative offices and the catering sector.

DESIGN AND CONSTRUCTION TEAM

CLIENT: Quebec City

ARCHITECT and PROJECT MANAGER: CCM2 Architectes 418-842-1967
+ CLC Architectes 418-694-0872

GENERAL CONTRACTOR: Unigertec 405-902-3142

STEEL CLADDING SUPPLIER: Ideal Roofing Company Limited 888-936-1867

STEEL CLADDING INSTALLER: Revetement Metallique Prevost 418-834-1500

CONSULTING ENGINEER: Structure/Civil WSP 418-623-7066

MECHANICAL/ELECTRICAL: Tetra Tech 418-871-8151

PHOTOGRAPHER: Stéphane Groleau Montreal: 514-373-8295
Quebec City: 418-522-4454

Nerves of Steel in Inuvik, NWT:
Galvalume™ Steel and Light Steel Framing provide Flexibility, Durability and Design Freedom in the North

There are many reasons why using steel products are beneficial to architects and builders everywhere, but one of the most useful reasons for steel in everyday design is because of its ability to handle extreme weather. The far North has a harsh climate, this includes bone-chilling cold temperatures that are not uncommon in places like the Northwest Territories and the sun and wind are very hard on materials.

Steel has a lot of flexibility, which provides plenty of design freedom. It's a robust material, light-weight, durable, attractive and maintenance free. Buildings in northern, remote locations are a particular challenge, therefore the use of durable, prefinished and corrosion resistant steel is important, which is why steel was the choice when it came time to construct the new NorthwesTel Central Office.

Both pre-painted and unpainted AZM 150 Galvalume™ coated steel was used on the exterior envelope. The cladding profile is Vicwest's CL438, which is 22mm (7/8") .61mm (.0239") corrugated steel cladding. The light steel framing for the exterior walls is 1.22mm (.048") structural LSF and the interior is .46mm (.018"). The roof is .61mm (.0239") coloured QC56083 Deep Water Green in Vicwest's Tradition 100 profile. The foundation for the building is steel piles, so as to not bother the permafrost.

The result is a design that is practical, durable, efficient and flexible.

The building was constructed of steel, which is prized for its durability and low-maintenance in the north. Both pre-painted and unpainted AZM150 Galvalume™ coated steel cladding were used on the exterior. It's a low-maintenance material proven to be good in the north.

Sheet steel cladding was used for both the roof and walls, while light steel framing was used for their durable, non-combustible qualities.

DESIGN AND CONSTRUCTION TEAM

OWNER: NorthwesTel

ARCHITECT: Stantec 867-633-2400

GENERAL CONTRACTOR: Arctic Canada Construction Ltd. 867-873-2520

STEEL CLADDING SUPPLIER: Vicwest 800-661-693

LIGHT STEEL FRAMING SUPPLIER: Groupe Conseil Sid Inc. 418-658-2266

EXTERIOR WALL CLADDING:
.61mm (.0239") AZM150 Galvalume™ coated steel

EXTERIOR WALL FRAMING:
1.22mm (.048") gauge 203mm (8") wind bearing steel studs

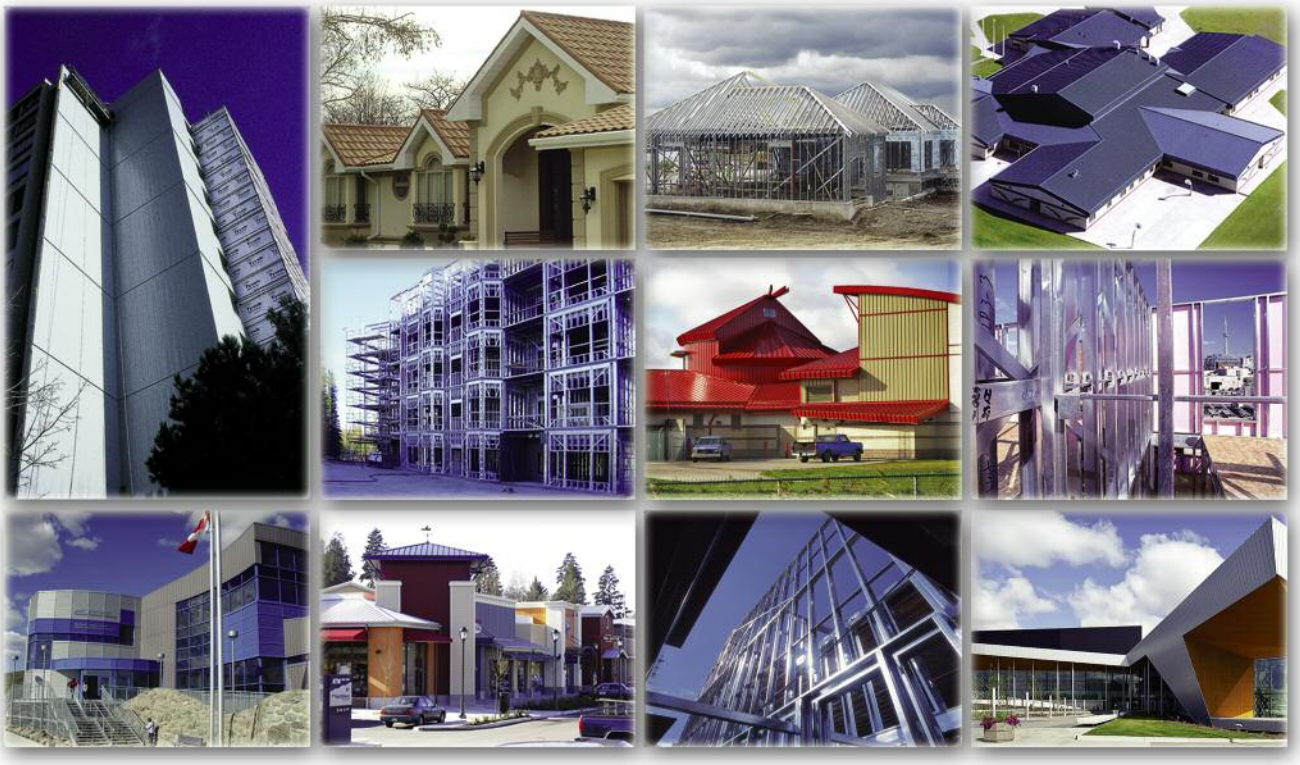
INTERIOR LINER PANEL: .46 mm (.018")

INTERIOR LINER PANEL: Technical Service Area 1.9mm (.075")

INTERIOR WALL FRAMING: .46mm (.018") steel studs

ArcelorMittal

Build on Success from top to bottom



Stronger, safer and more sustainable buildings. That's where innovations in steel are taking us. We continue to formulate steel that is lighter, improving an already superior strength-to-weight ratio for more efficient and effective structures.

Lighter and stronger steel is also making construction easier – requiring less energy to move and assemble and needing less extensive foundations. The result is stunning design, performance and sustainability. See how we're transforming the construction sites of tomorrow at: dofasco.arcelormittal.com/what-we-do/architects-corner.aspx

Solutions in Steel™

transforming tomorrow

@ArcelorMittal_D
facebook.com/arcelormittaldofasco
@arcelormittal_dofasco