



ArcelorMittal

steel design

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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.

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ArcelorMittal

transforming
tomorrow

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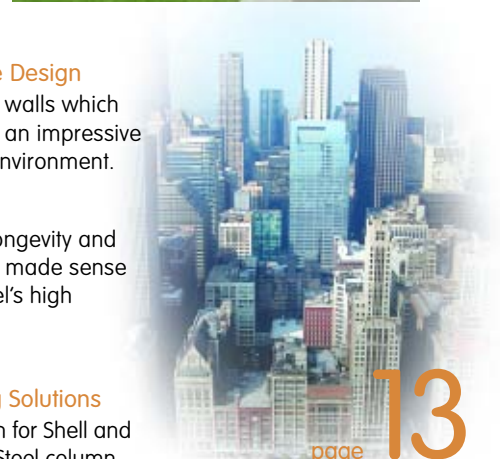
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3 Calgary Water Centre – achieves LEED Silver

The focal point of the new Calgary Water Centre is the cantilevered truss system and the curved AZM165 Galvalume Plus™ steel standing seam roof that adds artistic flair and energy efficiency.

6 Peak2Peak Gondola Station – Whistler/Blackcomb, British Columbia

For both buildings the FLEX-SYS® Building System was used. Its advantage over other structures is that all the structural elements were manufactured in-plant and only needed assembling after delivery, versus being cut, welded, and constructed on site. The buildings were completed between June and September 2008. Fast simple construction saw the Whistler building, for example, erected in six working days.

8 Dieppe Aquatic Centre – Integration of Sustainable Design

With its colourful steel paneling and floor to ceiling glass walls which allow light to permeate the interior, the Aquatic Centre is an impressive architectural masterpiece – in harmony with its natural environment.

10 Edmonton Humane Society, Alberta

The client was initially interested in steel because of its longevity and relative cost efficiency. "A steel clad facility in this climate made sense and was also a responsible material selection given steel's high recyclable content and the client's desire to be 'green'". Design Architect, George Miers.

13 Steel Provides Sustainable Structural and Cladding Solutions

One South Dearborn in Chicago, received LEED certification for Shell and Core rating approved by the U.S. Green Building Council. Steel column and beam shapes were supplied by ArcelorMittal. Another structural and cladding example, offering functionality, durability, as well as, sustainability is the Calgary Water Tower, which has been designed to achieve at a minimum LEED Silver.

14 The Last Word in Steel News

CSSBI and University of Waterloo, Carbon Neutral Project • Ecologo – Setting the Environmental Standard for Recycled Steel • Insurance program increases competitive advantage • Pinon House • Garcia House • Hurricane Creek Elementary School.

Designed to exceed at a minimum –
LEED Silver. 2009 CISC Steel Design
Awards of Excellence Award Winner...



Curved Steel Roof adds Artistic Flair and Energy Efficiency

"Who would have thought an old brown-field site in Calgary's south end could be transformed into such a magnificent, sustainable structure?"

Answer: a design team spearheaded by Edmonton's Manasc Isaac Architects Ltd. and Calgary's Sturgess Architecture. "We were inspired by the curvilinear nature of the adjacent road, which was patterned by the historic Grand Trunk Rail Line on the site. The long narrow building addresses the LRT Station on the west end, and the operations area on the east end of the site," said Jeremy Sturgess, architect in charge of design on the project. Located on 25th Avenue S.E. and Spiller Road, the 15,421m² (165,990 sq. ft.) Water Centre is home to Calgary's Water Resources and Water Services' professional and field staff.

The focal point of the \$43 million project is a 4,645m² (50,000 sq. ft.) curved standing seam roof structure clad with AZM165 Galvalume Plus™ steel over galvanized steel deck supplied by the Roll Form Group. The curved roof and wall, nicknamed the 'woof' by the client, acts as a blanket against the north winds and protects the garden to the south.

The building's vertical walls are covered with a steel shingle wall cladding system with corrugated cladding used on the south exterior walls underneath the overhang. All roof/wall cladding products are ArcelorMittal



Aerial view of the Calgary Water Centre with the curved AZM165 Galvalume standing seam roof, inspired by the curvilinear nature of the adjacent road, which was patterned by the historic Grand Trunk Rail Line on the site.

Dofasco's AZM165 Galvalume Plus, installed by Thermal Systems KWC Ltd., who formed both the shingles and corrugated panels for the vertical walls, as well as the standing seam roof. Designed with a cantilever truss

DESIGN AND CONSTRUCTION TEAM

CLIENT: City of Calgary

ARCHITECTURE:

Manasc Isaac Architects Ltd. 780-429-3977

In cooperation with Sturgess Architecture 403-263-5700

STRUCTURAL: Read Jones Christoffersen 403-283-5073

MECHANICAL AND ELECTRICAL: Keen Engineering (now Stantec Consulting Ltd.) 403-716-8000

CIVIL: Urban Systems Ltd. 403-291-1193

LANDSCAPE: Carlyle & Associates 780-424-6993

CONTRACTOR: Dominion Construction 403-291-2002

COSTING: Spiegel Skills + Associates 403-269-6007

ACOUSTICAL: ACI Acoustical Consultants 780-414-6373

STEEL CLADDING & DECK SUPPLIER:

Roll Form Group 1-800-233-6228

STEEL CLADDING FABRICATOR & INSTALLER:

Thermal Systems KWC Ltd. 403-250-5507

STRUCTURAL STEEL:

Metal Fab Industries Ltd. 403-236-5211

PHOTOGRAPHY:

Robert Lemermeier Photography Inc. 403-265-2224



West end of the Water Centre showing maximum 4.8m (15.7') high Warren truss spanning from 15m (49') high HSS 610 column to cantilevered truss projecting from building. Also visible is the ASTM653 Grade33, Z275 (G90) galvanized steel deck and AZM165 Galvalume Plus shingle wall panels.



SPECIFICATIONS

CURVED ROOF WALL CLADDING:

AZM165 Galvalume Plus standing seam steel
.61mm (.0239") – 4,645m² (50,000 sq. ft.)

STEEL SHINGLE WALL:

AZM150 Galvalume Plus steel .61mm (.0239")
– 2323m² (25,000 sq. ft.)

CORRUGATED WALL:

AZM165 Galvalume Plus 61mm (.0239") – 465m² (5000 sq. ft.)

GALVANIZED STEEL DECK:

ASTM A653 Grade 33, Z275 (G90) Galvanized
6039m² (65,000 sq. ft.)

STANDARD ROOF DECK:

38mm (1.5") deep by .76mm (.0299")

ACOUSTIC DECK:

38mm (1.5") deep by .76mm (.0299") and
38mm (1.5") deep by .91mm (.036")

STRUCTURAL FRAME:

5m (16 ft.) deep trusses cantilevering 13.6m (45 ft.) consisting of W200 x 46 (W8 x 31) top chords, W310 x 79 (W12 x 53) bottom chords, W200 x 46 (W8 x 31) verticals and 100 x 100 x 8 (4 x 4 x 3/8) double angle diagonals. 38mm (1.5") deck curved about weak axis spanning to C200 x 17 (C8 x 11.5) channels and W250 x 33 (W10 x 22) beams.
Steel to Canadian Standard CAN/CSA G40-21-M

ABOVE: South east corner showing both the corrugated (above) and shingle panel (below) .61mm (.0239") AZM165 Galvalume Plus wall cladding.

BELOW: East end of building with curved roof showing glass windows on curved surface, W530 curved section soaring to a height of 20m (65.5') above floor supported by W530 sections cantilevered from the face of the building.

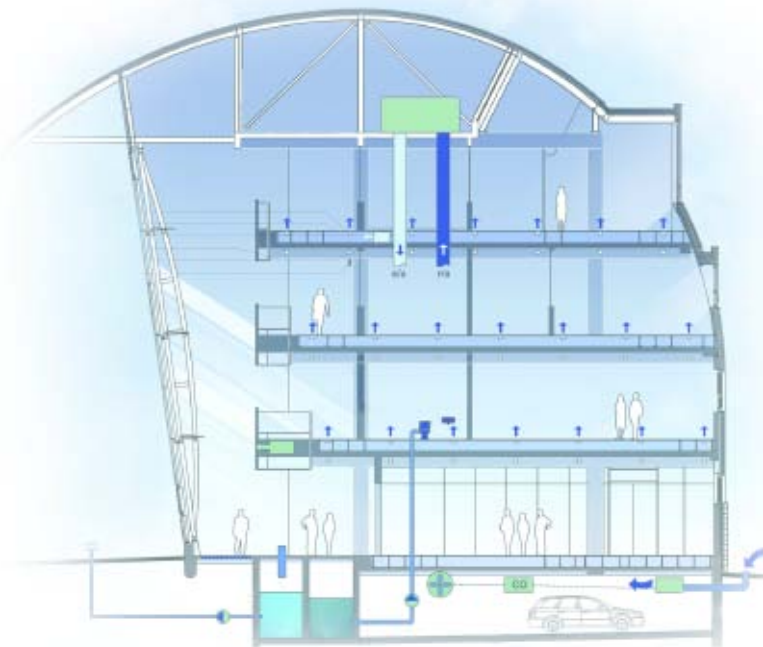


system, the roof supports the curved steel cladding, and provides shading to the fourth storey glass below.

"We really appreciated the flexible forms and visual lightness that we could achieve using a steel structure, both for the curved roof that shelters us from the north wind, and for the atrium structure on the south," said Manasc Isaac principal, Vivian Manasc.

The Galvalume Plus steel clad roof allows the City to collect rainwater from its gutters and trowels, diverting it to a large underground cistern for grey water use. It is an integral part of the overall water management system of the building.

"The Water Centre certainly hits the mark in terms of its very low water use and low energy use," said Sturgess architect, Lesley Beale. "The City also flushes the water meters to calibrate and test them, and all that water is used to flush the toilets afterward. "Coloured windows are supported by steel Vierendeel trusses, which vertically span four metres (13 ft.) to support the glazing. "If you look at a profile of those trusses, I think they are quite elegant from an architectural standpoint. It is quite a striking visual feature in the building," said structural engineer, John Charrett. Fourth floor visitors can gaze at the vaulted roof and see the steel trusses, giving them an appreciation of the structure.



When Intrawest Placemaking envisioned the ski gondola terminal buildings for Whistler and Blackcomb mountains in British Columbia they wanted iconic structures that reflected the ambience of the area. After all, they were going to be at either end of the longest unsupported span of its kind in the world, some 3 km. Carrying Sky Cabin gondolas more than 415m (1,360') above Fitzsimmons Creek to link the peaks, it would also be the highest.

High Praise for Steel Building System



Gondola station and lodge on the Whistler side.

Buildings at both Whistler and Blackcomb are the FLEX-SYS® Building System from Behlen Industries. One of the advantages over other structures is that all the structural elements were manufactured in-plant and only needed assembling on site.



Initially the design was based on a conventional steel structure which, unfortunately, came in significantly over budget. Intrawest approached Colony Management Inc. of Vancouver, BC about the possibility of substituting a steel building system (SBS). John Morley, VP Development for Intrawest, explains: "We thought we could achieve significant cost savings, but we and the architect had misgivings about a subsequent loss of architectural integrity. We were concerned about losing some of the interesting visual features."

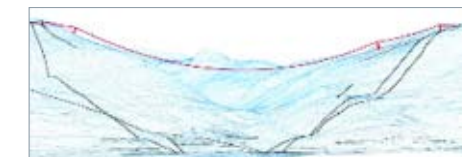
David Thompson, President of Colony, takes up the story. "I suggested that before we quote on an 'ordinary' building, we should see if we could build what they designed and within budget. In collaboration with Behlen Industries LP we came back with a design that achieved exactly that."

Moving from design to finished building provided its own challenges, beginning with the logistics of getting construction materials up the mountains. And then you have to erect them. Meredith Perez, Marketing Supervisor at Behlen, adds, "You not only face the challenge of the location in terms of seismic, wind and snow loads not normally encountered, but the construction crews face extreme weather conditions, even in summer."

"Both buildings are our FLEX-SYS® Building System. Their advantage over other structures is that all the structural elements were manufactured in our plant and after delivery only needed assembling versus being cut, welded, and constructed on site." The buildings were completed between June and September 2008. Fast simple construction saw the Whistler building, for example, erected in six working days.

The mountain peak 'feel' of each building is achieved with a single slope roof with a high point that tapers out from the base of the building at two different angles. The high side wall is clad with a translucent Rodeca panel through which natural light floods the interior and also allows people outside to see the steelwork and gondolas inside the building. The remainder of the cladding is

Views of the gondola station with Galvalume Plus cladding and translucent Rodeca panels, allowing views of the interior workings.



Valley and Lift – Whistler to Blackcomb.

ArcelorMittal Dofasco's silver-grey Galvalume Plus™ steel. The other structural components were fabricated from galvanized steel.

From Intrawest's point of view a further advantage of working with a SBS was that every change they wanted as the project progressed was met by a hard quote from Colony. As David Thompson points out, "With other types of construction, change costs are a best guess. With SBS you can quote accurately up-front, be flexible enough to customize – and do it for less."

DESIGN AND CONSTRUCTION TEAM

OWNER:
Intrawest Placemaking 604-697-6310

ARCHITECT:
Cannon Design 604-688-5710

ENGINEERING:
Behlen Industries LP 204-728-1188

GENERAL CONTRACTOR:
Timberline Construction 604-985-6116

BUILDING MANUFACTURER:
Behlen Industries LP 1-800-663-7538

BUILDING INSTALLER:
Colony Management Inc. 604-688-2604

"With steel building systems (SBS) you can quote accurately up-front, be flexible enough to customize and do it for less."

David Thompson, Colony Management

Whistler and Blackcomb

Angles, Bracing and Light Gauge:
Z275 Galvanized. Approx 8,840m (29,000 lineal feet) of 203mm (8") and 254mm (10") Lite gauge Cee's and Zee's shapes/angles.

Columns, Rafters and I beams:
Hot rolled plate welded to many different shapes and sizes.

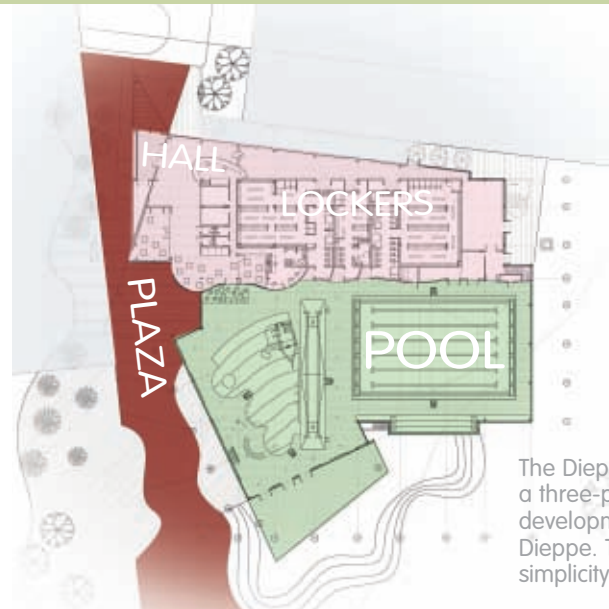
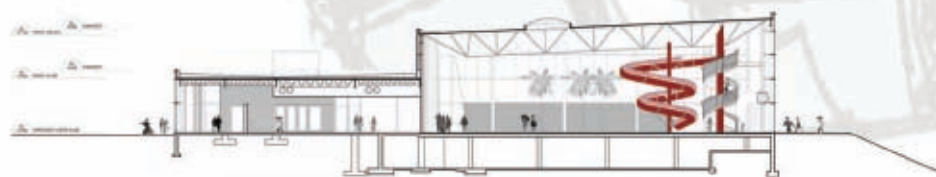
Wall Cladding:
Approx 1,254m² (13,500 sq. ft.) .61mm (.0239") Galvalume steel substrate coloured QC2624 Metallic Silver. Cladding profile: Behlen Elite Rib.

Standing Seam Roof:
Approx 2880m² (31,000 sq. ft.) .61mm (.0239") AZM-180 Galvalume Plus steel

Roof Profile:
Behlen SSR24. Misc. components and fasteners – 27,600 Kg (61,000 lbs.)

One of the best things that can happen to a community – especially one that is reviving itself – is a new recreational facility to bring people together for fun and fitness. The Dieppe Aquatic Centre in New Brunswick is the first part of a three-phase recreational facility being built as part of the new development in the northern part of the city known as Uptown Dieppe.

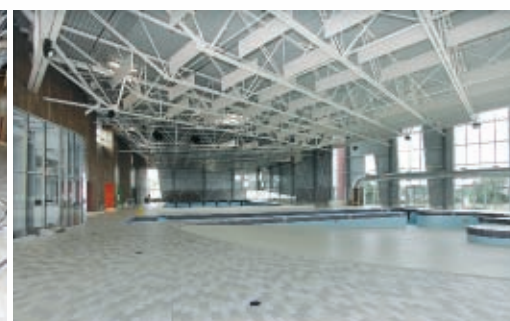
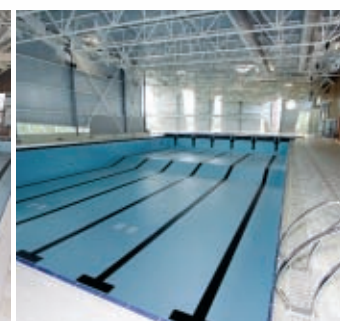
Dieppe Aquatic Centre – Integration of Sustainable Design



“The initial install was very impressive. The speed of erection was fast and the ability to go from a shell to weather tight very quickly is a nice feature of the product.”

Ronald Doucet, Sr. Project Manager, Ellis Don

The Dieppe Aquatic Centre in New Brunswick is the first part of a three-phase recreational facility being built as part of the new development in the northern part of the city known as Uptown Dieppe. The approach to design is founded on construction simplicity and based on primary materials and passive resources.



The exterior of the Aquatic Centre is clad with prepainted .76mm (.0299") insulated steel panels, coloured QC2624 Silver Metallic, QC16072 Charcoal and QC16080 Bright Red. Interior liner is prepainted galvanized coloured QC1546 Interior White.

With its colourful steel paneling and floor to ceiling glass walls that allow light to permeate the interior, the Aquatic Centre is an impressive architectural masterpiece that sits in harmony with the natural environment. The landscape features a park-like area and open air retention pond and a continuous passage joins the two parts of the city as it ascends across the building's entry plaza.

Discussing design objectives of the \$9.9 million project, architects at Dan S. Hanganu Architects/Architecture 2000 Inc. en consortium report, "The architectural approach to

the Aquatic Centre is generated by its landscape context – the topography, the views and orientation are intrinsic in the design. It is fundamental that the architecture reveal and support the recreational quality of the Aquatic Centre. Our urban and architectural intervention has created a place of interactivity. A social place par excellence for sports, meetings and interaction, the reconstituted public space will enable, by its character and quality, the transformation of the aquatic centre into a true agora."

Construction of the 3,300m² (35,520 sq. ft.)

Aquatic Centre began in October 2007 and was substantially completed April 2009. The facility features a principal pool area that can accommodate a maximum of 377 swimmers and also includes a family pool and deck, a two-lane 25 metre warm-up pool and a six-lane 25 metre competition pool, as well as a spectator area. An extensive glass wall separates the pools from a food court rest area. A linear corridor services a classroom and meeting area, administrative offices, reception and individual change rooms for men, women and families.

"The prepainted steel panels fit the design nicely by allowing long open spans. Another benefit of steel is its energy efficiency and environmental principles in general coincided with the City of Dieppe's sustainable policies."

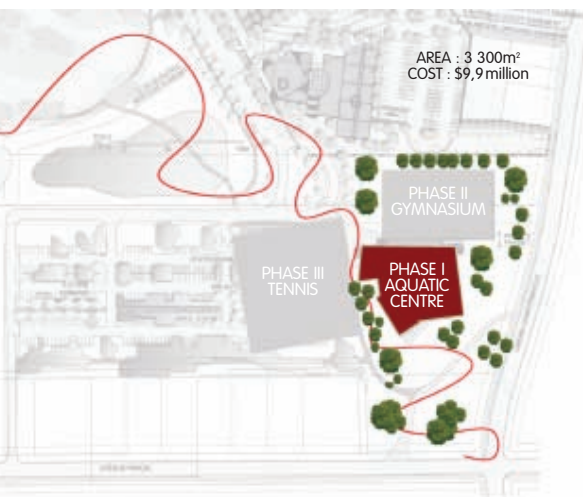
Raven Spanier, Architecture 2000

Raven Spanier, Dan S. Hanganu Architects /Architecture 2000 Inc. en consortium, comments that the design approach was "founded on a constructional simplicity and based on primary materials and passive natural resources. The envelope is composed of prefabricated insulated steel panels. The quality and finesse of details is provided by the utilization of large openings, glazed entrance canopies and the interplay of colour between these elements."

There were many advantages to using steel for the project. Roland Doucet, Senior

Project Manager at Ellis Don, the General Contractors on the project, noted, "The initial install was very impressive. The speed of erection was very fast and the ability to go from a shell to weather tight very quickly is a nice feature of the product."

Raven Spanier agrees. "The prepainted steel panels fit the design nicely by allowing long open spans. Another benefit of steel is its energy efficiency and environmental principles in general coincided with the City of Dieppe's sustainable policies."



DESIGN AND CONSTRUCTION TEAM

ARCHITECT: Dan S. Hanganu, Architects/Architecture 2000 Inc. en Consortium
Architecture 2000 Inc.: 506-383-8500
Dan S. Hanganu, Architecte: 514-288-1890

GENERAL CONTRACTOR:
Ellis Don 902-422-4587

SITE SUPERVISION: Celtic Consulting
Management Inc. 506-383-4991

INSULATED WALL PANELS:
Vicwest – Atlantic Canada 506-857-0057

CIVIL ENGINEERS:
Terrain Group Inc. 506-857-1675

CONSULTING MECHANICAL ENGINEERS:
Hoadley Engineering Inc. 506-855-1414

STRUCTURAL CONSULTANTS:
Valron Engineers Inc. 506-856-9601

ELECTRICAL CONSULTANTS:
MCW Maricor 506-857-8880

POOL CONSULTANTS:
NACEV Consultants Inc. 514-352-9152

PHOTOGRAPHY:
Ron Ward/Times Transcript

Insulated Steel Wall Panels

Vicwest supplied 76.2mm (3") thick AccuSpeed Insulated Steel Panels with 1,067mm (42") coverage.

The exterior sheets consist of:
929m² (10,000 sq. ft). prepainted galvanized to ASTM 653, .76mm (.0299") coloured QC2624 Silver Metallic

232m² (2,500 sq. ft). prepainted Galvalume to ASTM 792, .76mm (.0299") coloured QC16072 Charcoal

465m² (5,000 sq. ft) prepainted Galvalume coloured QC16080 Bright Red.

The interior liner is:
Prepainted galvanized to ASTM 653, .45mm (.0179") coloured QC1546 Interior White 4/0.



"The only animal that leaves a shelter alive, leaves with a human being." That mandate of the new Edmonton Humane Society prompted a major design objective to create a humane and welcoming environment for both animals and people. "The concept of creating an exciting and stimulating animal care centre where people are attracted to come, even if they are not looking for an adoptable animal, was an underlying goal of the design," explains Design Architect, George Miers.

Edmonton Humane Society Colourful, Inviting and Cost Efficient

Light steel framing is a proven technology and reflects the superior strength and consistency of steel. Steel, being inorganic, does not support the growth of mold or give off gas, thus contributing to excellent indoor air quality. It is endorsed by the Asthma Society of Canada.



Light steel framing systems (LSF) allow ease in construction through flexibility in detailing to and adapting to architectural requirements, thus making it an obvious choice.

The use of steel, which was used extensively throughout the 3,395m² (43,000 sq. ft.) facility, not only met that intention, but added to the overall appeal. Five different colours of pre-painted steel were used for the exterior wall and roof cladding presenting a showcase that is attractive and inviting. Miers explains that the client was initially interested in steel because of its longevity and relative cost efficiency. "A steel clad facility in this climate made sense and was also a responsible material selection given steel's high recyclable content and the client's desire to be 'green'. In fact, the concept of using a highly recycled material to clad a facility dedicated to 'recycling' domestic animals into loving and caring homes seemed philosophically appropriate."

The overall Campus Master Plan encompasses one of the most comprehensive Domestic Animal Care Facility programs ever undertaken, as it includes not only traditional adoption, intake and holding functions, but also a

DESIGN AND CONSTRUCTION TEAM

PRIME ARCHITECT:
Number TEN Architectural Group 204-942-0981

DESIGN ARCHITECT:
George Miers and Associates Architecture and Planning
925-631-6900

CIVIL ENGINEER:
Al-Terra Engineering 780-440-4411

LANDSCAPE ARCHITECT:
EIDOS Consultants Incorporated 780-428-5050

STRUCTURAL ENGINEER:
Crosier Kilgour & Partners Ltd. 204-943-7501

MECHANICAL AND ELECTRICAL ENGINEERS:
SMS Engineering Ltd. 204-775-0291



comprehensive veterinary medicine area, an educational classroom area, a 456m² (5,000 sq. ft.) training pavilion called the Enrichment Centre, future boarding and doggie day care services. There is even a site for a future wildlife facility.

Wind bearing steel studs supplied by Steelform

CONTRACTOR:
Chandos Construction 780-436-8617

STEEL SUPPLIER: Roll Form Group: 1-800-233-6228

STANDING SEAM ROOF & WALL CLADDING:
Midform Custom Flashings 780-979-0360

STRUCTURAL STEEL FRAMING:
Rampart Steel Ltd. 780-465-9730

LIGHT STEEL FRAMING SUPPLIER:
Steelform Building Products 780-440-4499

LIGHT STEEL FRAMING INSTALLER:
KDH Drywall 780-416-8668

PHOTOGRAPHY: Jeff Moroz and Ken Laidlaw

Steel framing members in a variety of standard shapes and sizes and in varying steel thicknesses have been used to accommodate virtually all structural requirements.



Five different colours of pre-painted steel were used for the exterior wall and roof cladding – presenting a showcase that is attractive and inviting.

Building Products were used for the exterior walls of the building and Midform Custom Flashings and Installations Inc. installed the corrugated steel panels for the exterior siding, soffit and Colonnade roofs. All material is ArcelorMittal Dofasco's prepainted galvalume steel supplied by Roll Form Group. Miers explains why so many different colours were used. "This is a big building and given an initial 'cost' goal to keep the overall form somewhat simple, we felt that it was important to break down the structure's mass as much as we could and create interest, as well as a sense of fun and playfulness. In addition, the facility has a number of different entrances, including the Main Adoption Centre, the Education/Enrichment Centre, a Public Intake Entrance, as well as staff entrances, and the break in colours coincides in part with these different components and is consistent with the overall master plan goal.

The new Edmonton Humane Society is an exceptional community services project. George Miers emphasizes, "One of the unique features of the project, which hopefully



Steel roofing and cladding allow simplicity in detailing and installations while providing simple, elegant and clean facades.

is a harbinger of things to come, has been the personal commitment – beyond what you normally see on a construction project". Bob Rehm, Project Manager, Chandos Construction, the General Contractor on the project agrees, "We've gone the extra mile for this client to provide the services they require and keep costs in line."

Number TEN Architectural Group, the prime architect on the project, emphasizes the many advantages of using light steel framing for this project. "It provides flexibility, affordability and is advantageous to the construction schedule." Bob Rehm agrees. "I've always been a fan of steel construction. It is flexible and easy to use, it's fire resistant and equally important – steel has longevity."



ArcelorMittal Dofasco's prepainted galvanized steel with application specific paint systems' proven field performance contributed to the overall effect and helped meet the project's objectives – durable, visually interesting buildings meeting all design, cost and performance criteria.

Interior Light Steel Framing (LSF)

.44mm (.0175") Z120 (G40) COATING:

63.5mm x 31.75mm flange (2.5" x 1.25") – 250S125-18	73m (240')
92mm x 31.75mm flange (3.625" x 1.25") – 362S125-18	5532m (18,150')
92mm (3.625") track – 362T125-18	1158m (3,800')
92mm (3.625") deep track – 132M362T200-18	475m (1,500')
152.4mm (6") stud x 31.75mm (1.25") flange – 600S125-18	14759m (48,420')
152.4mm (6") deep track – 600T125-18	2103m (6,900')
152.4mm (6") deep track – 600T200-18	975m (3,200')
203.2mm (8") track – 800T125-18	30.5m (100')

.83mm (.033") Z180 (G-60) COATING:

63.5mm x 31.75mm (2.5" x 1.25") flange – 250S125-33	91m (300')
203.2mm (2.5") Track – 250T-125-33	91m (300')
92mm (3.625") stud x 31.75mm (1.25") flange – 362S125-33	1213m (3,980')
92mm (3.625") track – 362T125-33	61m (200')
152.4mm (6") stud x 31.75mm (1.25") flange – 600S125-33	1673m (5,490')
152.4mm (6") stud x 41.3mm x (1.625") flange – 600S162-33	686m (2,250')
152.5mm (6") track – 600T125-33	793m (2,600')
152.4mm (6") deep track – 600T200-33	158.5m (520')

STRUCTURAL LOAD BEARING

1.12mm (.044") Z275 (G90) coating, Grade 230Mpa (33ksi)

152.4mm (6") stud x 41.3mm (1.625") flange – 600S162-43	128m (419')
152.4mm (6") deep track – 600T200-43	61m (200')
1.37mm (.054") Z275 (G90) coating, Grade 340Mpa (50ksi)	
152.4mm (6") stud x 41.3mm (1.625") flange – 600S162-54	1190m (3,905')
152.4mm (6") track – 600T125-54	366m (1,200')
152.4mm (6") deep track – 600T200-54	244m (800')
1.73mm (.068") Z275 (G90) coating, Grade 340Mpa (50ksi)	
152.4mm (6") stud x 41.3mm (1.625") flange – 600S162-68	633m (5,358')
152.4mm (6") track – 600T125-68	91m (300')
152.4mm (6") deep track – 600T200-68	305m (1,000')

2.59mm (.102") Z275 (G90) coating, Grade 340Mpa (50ksi)

355.6mm (14") joist x 63.5mm (2.5") flange – 140S250-97	29.3m (96')
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While the building industry provides 5% to 10% of worldwide employment and generates 5% to 15% of GDP (Gross Domestic Product), the built environment accounts for 40% of energy consumption, 40% of CO2 emissions, 30% of the consumption of natural resources, 30% of waste generation and 20% of water consumption.

Steel provides sustainable Structural and Cladding Solutions

Recognized as a mainstay by builders, steel offers functionality, durability and strength along with environmental benefits. It is dimensionally stable and can be provided in exact sizes which helps reduce building site waste. When it comes to reusing old steel materials, the magnetic properties of the metal make it easy to separate and move.

From an energy-savings and environmental perspective, the ability to create tight building envelopes using steel provides numerous benefits. Most importantly, building with steel helps reduce air loss resulting in improved heating and air conditioning performance.

An excellent case study for structural steel construction is One South Dearborn in Chicago. Completed in November 2005, property developer, Hines, selected ArcelorMittal for this project because it required steel

that was not only easily available and good quality, but also sustainable, durable and cost effective.

Located in the heart of downtown Chicago, the construction site needed to produce minimal dirt and the structure required a tight timeline to be built. Steel column and beam shapes from ArcelorMittal arrived and were able to be erected quickly to form the load-bearing structure that supports the office block. The project received LEED certification for Core and Shell rating approved by the U.S. Green Building Council.

"We chose ArcelorMittal steel because the company is the industry leader in providing the higher grade of steel we needed to form our load-bearing columns," said David Wick, Vice President, Conceptual Construction, Hines. "This unique and very pure steel provides excellent structural benefits and can be easily dismantled and recycled at the end of the building's life."

Another structural and cladding example that offers functionality, durability, as well as sustainability, is the Calgary Water Tower, which has been designed to achieve, at a minimum, LEED Silver. Peak2Peak – Whistler/Blackcomb, the Dieppe Aquatic Centre and the Edmonton Humane Society are other examples in this issue, which address durability, functionality and sustainability along with economy.

The following Web sites provide more information on the benefits of constructing with steel:

- Steel Recycling Institute:
www.recycle-steel.org
- American Institute of Steel Construction:
www.aisc.org/sustainability
- ArcelorMittal Construction:
www.constructalia.com
- Canadian Sheet Steel Building Institute:
www.cssbi.ca
- Canadian Institute of Steel Construction:
www.cisc-icca.ca

ArcelorMittal is the world's largest steel manufacturer, for more information please contact Brian Ribic at Brian.Ribic@arcelormittal.com or Ken De Souza at Ken.deSouza@arcelormittal.com

In 2006, the 40-story, 76,700m² (828,538 sq. ft.) office tower (centre of photo) achieved a Leadership in Energy and Environmental Design (LEED) for Core and Shell rating approved by the U.S. Green Building Council.



One South Dearborn



Peak2Peak – Whistler/Blackcomb



Dieppe Aquatic Centre



Edmonton Humane Society



Calgary Water Centre

Steel is the most recycled material in the world. Steel's infinite recyclability without quality loss, permits raw material savings, significant reduction of environmental impact in the manufacturing process, durability and eco-friendly products and coatings.



The CSSBI and University of Waterloo pursue Carbon Neutral Steel Building Systems

Cambridge, ON (June, 2009) – The Canadian Sheet Steel Building Institute (CSSBI) Canada's foremost authority on sheet steel building products, has recently joined forces with the University of Waterloo, School of Architecture and the Department of Civil Engineering, to lead the way towards a Carbon Neutral Steel Building System (CN-SBS).

While builders are achieving greener, more sustainable designs and pursuing certification programs, their efforts are not enough. The CSSBI and the University of Waterloo have created a Carbon Neutral Steel Building System (CN-SBS) Project Team to explore the aspects of design and construction required to achieve carbon neutrality.

Leading the project as architectural consultant is Professor Terri Meyer Boake, LEED® AP, Associate Director of the School of Architecture at the University of Waterloo. "This CN-SBS project is in response to the growing percentages of greenhouse gases and the mounting dilemma of global warming," says Professor Boake. "We want to create and disseminate the resources and tools needed to integrate carbon neutral and zero-energy design into professional architecture programs and practice," she adds.

The CN-SBS Project Team will evaluate three SBS building projects in terms of sustainable design and energy use, using a variety of existing green building protocols. The project will propose new approaches for using steel, determining how Steel Building Systems (SBS) can improve the energy efficiency of a building while decreasing its overall carbon footprint. The team will use a retail building of approximately 600m², which represents a large segment of the built environment. The three concept buildings that will be explored and evaluated include – new construction with virgin steel; new construction with reclaimed steel; and adaptive re-use of an existing building using steel products as the primary structural/architectural materials.

Professor Lei Xu, Associate Director of the Canadian Cold-Formed Steel Research Group, Department of Civil Engineering at the University of Waterloo is also working with Professor Boake as the project's structural engineering consultant. Both professors are joined by the CSSBI General Manager, Steven R. Fox, PhD, P.Eng., who represents CSSBI members, many of which consist of SBS manufacturers. "Steel, as a construction material, has many environmental benefits already realized in SBS buildings around the world," says Dr. Fox. "We're trying to help the Canadian industry move beyond green. This CN-SBS project should create and collect data that building designers need to push our building infrastructures toward carbon neutrality. This whole process is only the beginning," he adds.

The CN-SBS project is an ongoing endeavor that will run until November, 2009. To obtain more information on the CSSBI, sheet steel products, or the CN-SBS Project, visit www.cssbi.ca or call Steve Fox at 519-650-1285.



St. Louis, Missouri

Garcia Home, a modern house in a traditional neighborhood

The Garcias, a young married couple with a small business, wanted a sustainable, modern 'Dwell House' for their 36.58m x 10.67m (120' x 35') lot in south St. Louis that anticipated current and future needs. In an effort toward 'green' building and living, the home is built of mostly renewable materials.

With sustainable design features such as tan brick, corrugated galvanized steel panels, large metal windows and flat roof on the exterior, the home

DESIGNER: Killeen Studios Architects, St. Louis 314-771-0883

The exterior, tan brick, corrugated galvanized panels, large metal windows and flat roof, was designed to have the modern lines the owners desired yet tastefully contrast the neighboring 1920s bungalows.

was designed to have the modern lines the owners desired yet tastefully contrast their neighboring 1920s bungalows.

The city location eliminated the Garcias' commute to work and other activities, diminishing their carbon footprint. A once-a-week gas tank fill up habit was reduced to just once a month.

The home received first place in St. Louis Magazine's AT HOME's 2008 Architect and Design Awards, in the category of "Best Residential Architecture (less than 4,000 sq. ft.)."



EcoLogo – Setting the Environmental Standard for Recycled Steel

The EcoLogo Program is North America's largest and most recognizable environmental certification mark. It is a third-party, multi-attribute eco-labelling program, approved by the Global Ecolabelling Network, an international association of eco-labelling programs as meeting the ISO 14024 standard.

Originally formed in 1988 by Environment Canada, the EcoLogo is now managed by TerraChoice – authors of the "Seven Sins of Greenwashing," which gathered international media attention and exposed a nerve with consumers around false or misleading environmental claims. There are currently more than 100 categories of EcoLogo-certified products, one of which is "Steel for Use in Construction Projects" (CCD-150).

What do EcoLogo-certified products mean for the construction and steel industry? They mean a reduction in the use of resources, a reduction in energy use, and a reduction in toxic emissions to the environment. It also means that EcoLogo-certified steel products meet or exceed all applicable governmental and industrial safety and performance standards. It means a minimum total recycled content of 50%, based on a rolling 12-month average and a minimum total post-consumer content of 15%, based on a rolling 12-month average. The recycled content required in the EcoLogo standard could also contribute up to two credits toward LEED certification. It means organizations carrying this type of EcoLogo-certified product have a sound environmental management system and energy use policy. It means that when you purchase an EcoLogo-certified steel product for use in construction, the EcoLogo Program is behind it, verifying that the product is a leading environmental choice.

For more information about the EcoLogo Program, visit: www.ecologo.org

Insurance program increases competitive advantage for steel-framed construction in Canada

Washington, D.C., May 6, 2008 – The Steel Framing Alliance (SFA) and Purves Redmond Limited Insurance Brokers (PRL) (a member of Wells Fargo Global Broker Network), have launched a comprehensive insurance facility named STEEL Advantage Canada that provides Canadian builders who use steel framing with preferred rates on a broad range of insurance products.

The STEEL Advantage Canada program makes steel framing even more competitive with other construction materials. The program is specifically tailored for lightweight steel-framed construction projects, including single-family tract, low-rise multi-family, mid-rise commercial and mixed-use structures. The program is currently available to all lightweight steel construction projects nationwide.

"Lightweight steel framing has proven to be a cost-effective and durable structural framing solution for projects in these market segments. With the addition of this program we've strengthened our position as one of the most economically feasible building materials for residential and commercial construction," said Michael Moore of ArcelorMittal Dofasco, and an SFA Board member.

With STEEL Advantage Canada, the SFA and Purves Redmond Limited are enhancing the level of insurance products available in the market. Purves Redmond have held negotiations with major insurance providers to create a suite of products including General Liability, Umbrella and Excess Liability, Builders Risk, and Commercial Property.

"This facility is a unique insurance and risk management offering because it provides builders and consumers with a significant incentive for using steel framing in their construction projects," said Ken Fedosen of Purves Redmond Limited. "Insurance pricing can fluctuate tremendously depending upon many key factors, such as the period of time for project completion, materials used to build the structure, and the likelihood for future structural claims and lawsuits, etc. We have been successful in convincing underwriters that the risks associated with all of these factors are greatly reduced when builders use steel framing."

"Since steel is non-combustible, policies for steel-framed projects are more attractive to underwriters and insurance companies than those projects built with wood framing. When industry defined non-combustible construction is applied, this results in premium discounts of anywhere between 15% – \$40%," said Fedosen.

Fedosen went on to explain that final premiums would depend upon many factors, such as project type (commercial vs. residential), loss history for the contractors, geographical location of the project, etc.

"The Steel Framing Alliance continues to provide resources to both owners and builders so that they can explore innovative and cost-effective framing solutions for their next project. This new suite of insurance products demonstrates our commitment to the Canadian building community," added Moore.



The .61mm (.0239") Galvalume SSR 'cool roof' with a Kynar 500 finish is designed to reduce the heat island effect.

The school's design allows it to rely heavily on natural light. Though the project cost \$10.4 million, reduced maintenance and energy costs, save the school \$65,780 and \$24,280 a year respectively. The design is expected to save the community \$8.5 million overall – over the building's expected 50-year lifespan.

ARCHITECT: Brooks Jackson Architects Inc. GENERAL CONTRACTOR: James H. Cone Inc.

Benton, Arkansas

Hurricane Creek Elementary School

Hurricane Creek Elementary School a "green school," becomes the second LEED certified school in Arkansas. Hurricane Creek has more than 21,945m² (72,000 ft. sq.) and can serve up to 635 students. The 24 gauge Galvalume standing seam roof with a Kynar 500 finish was selected because it can deliver high solar reflectance and high thermal emittance.



The redesign of this 1950s mid-century ranch modernizes a concrete block and plate glass home that was structurally failing due to poor soil conditions.

Boulder, Colorado Pinon House

The original concrete block, unfinished cedar fence, mild steel door, and Galvalume steel roof create a palette of natural materials that act in concert as markers of the synthesis between old and new architecture and reconsidered design philosophies. According to Rob, "sustainable design starts with conservation".

DESIGN: Rick Sommerfield, the 3rdspace and Rob Pyatt, Pyatt Studios



The Galvalume ceiling treatment for the kitchen helps reflect light back down onto the work surfaces and continues outside, seemingly through the glass, to cover the soffit. Once outside the steel turns up the fascia where it hides an integrated gutter and ultimately becomes a Galvalume standing seam steel roof.

EDITORIAL INQUIRIES

We would like to hear from you!

If you have comments about this issue or a project you would like to see in an upcoming issue of *Steel Design*, please send a description of the project, include photographs, to:

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Kilworthy, ON P0E 1G0
Or email:
davidfollis@vianet.ca



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