

# Steel Design

**DOFASCO**  
Solutions in Steel

FALL 2005 | VOLUME 37 | NO.2

## **Stratus Winery :**

**the first building in Canada  
and the first winery in the world to  
receive full LEED accreditation**

## **Jonah Amitaanq School**

**reflects the building guidelines  
established by the Gov't of Nunavut.**

## **The Village:**

**Park Place Shopping Centre in Vancouver  
evokes a 'main street' feel with its  
250,000 sq. ft. of retail space contained  
in seven free-standing buildings.**

**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, recreational, industrial 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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Cover Photo, Park Place Village:  
Derek Lepper Photography

**DOFASCO**  
Our product is steel. Our strength is people.

## IN THIS ISSUE

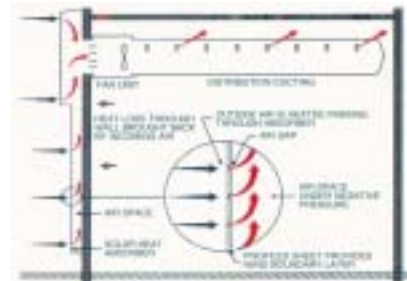


**Greening with Steel**

The LEED™ (Leadership in Energy and Environmental Design) program was launched in Canada by the Canadian Green Building Council (CGBC). Its aim is to minimize buildings' environmental impact through sustainable green design and construction. **3**

**Galvanized Steel Solarwall Reduces Building Energy Consumption**

Quebec warehouse stands to save as much as \$19,000 a year in heating costs with a trademark system that uses passive solar energy to preheat building air. **6**



**Prepainted Steel Cladding and Light Steel Framing Combat Harsh Conditions**

The design for the new Jonah Amitnaaq School, in Baker Lake, occupied since August 2004, allows it to function both as a school and as a community library. After hours both the library and gymnasium can be accessed directly from the entrance vestibule without entering the rest of the building. **8**



**Prepainted Steel Insulated Sandwich Panels Contribute to Economy and Speed of Erection**

The International Fibre Centre is a research and testing facility dedicated to the study of wool processing techniques from shearing to spinning. The striking structure is clad entirely in 7000m<sup>2</sup> (75,350 sq. ft) of pre-painted Zinalume® steel (Galvalume™ in Canada), insulated sandwich panels, in the Metallic Series. **11**



**Steel helps the new look old**

The Village evokes a 'Main Street' feel with its single, winding street and 23,225m<sup>2</sup> 250,000 sq. ft. of retail space contained in seven free-standing buildings. Each building is markedly different in terms of its appearance. The aesthetics have been described by visitors as 'funky', 'random' and 'eclectic' – the effects achieved by the combination of colours and architectural shapes. **12**

**Steel Design News**

• Cool Roofing standards like LEED, have migrated north of the 49th. • The new and innovative Pedestrian Bridge crossing Fallsview Blvd. in Niagara Falls, designed by Stanford Downey, Architect, Inc. **14**



**Stratus Winery, Niagara-On-The-Lake & Steelcare, Hamilton, Ontario**

# Greening with Steel

The LEED™ (Leadership in Energy and Environmental Design) program was launched in Canada by the Canadian Green Building Council (CGBC). Its aim is to minimize buildings' environmental impact through sustainable green design and construction. Points are awarded in seven credit categories, five of which steel contributes to: Building Reuse, Construction Waste Recycling, Resource Reuse, Recycled Content, and Local/Regional Materials.



*Stratus Winery was the first building in Canada and the first winery in the world to receive full LEED accreditation.*

**T**he first building in Canada and the first winery in the world to receive full LEED accreditation is the 1870m<sup>2</sup> (22,000 sq.ft.) Stratus Winery in Niagara-on-the-Lake, Ontario. Architect Les Andrew designed the facility.

There are two structures: the wine-making area and barrel cellar are in a pre-engineered Flex-Sys steel building system designed and fabricated by Behlen Industries. A smaller glass and site-framed steel retail area is attached.

Hot dipped galvanized steel was used throughout the main structure framing to avoid the use of paint and accommodate the humid atmospheres present. The exterior cladding is Behlen's AWR profile 46mm (.0179") unpainted Galvalume™ covered with cedar siding to create a 'barrel feel', and an energy-saving thermal roof system incorporates a AWR profile 61mm (.0239") unpainted Galvalume Plus™ standing seam roof.

Les Andrew comments, "What makes this winery different is an 18-ton dual pressure vessel hoist in the barrel cellar to facilitate blending wines. Steel's strength allows us to do that and to have 28metre (92-ft) clear



architects and construction managers were Chamberlain Architect Services Limited.

The project began in December 2003 and was completed in May 2004. The speed and ease of erection of an SBS was significant with an extremely tight schedule and tough winter weather conditions.

The facility comprises a shipping/ receiving bay, two storage bays, and a 2-storey attached office. The Butler TMR roof system incorporated 61mm (.0239") Galvalume Plus with 228mm (9") fibreglass insulation to provide an R30 value, and a wall system of 61mm (.0239") and galvanized panels – Agway 6-150 F, 8000 Series White-White with 152mm (6") insulation providing R20.

As with Stratus, a steel building system not only contributed to LEED through the recycled content aspect, but also offered economy and availability, plus flexibility for future expansion. Steelcare President Demetrius Tsafaridis adds, "The end result was an attractive, well-functioning facility of which we're very proud, delivered on time and under budget."

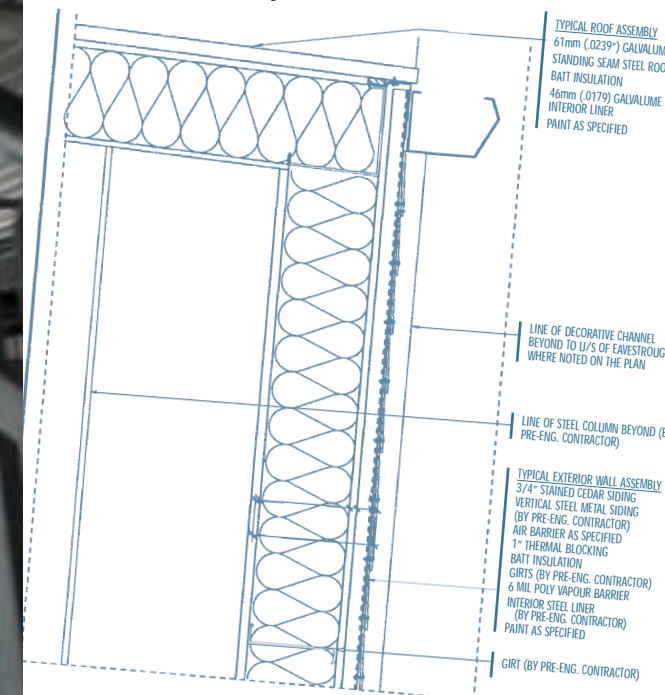
*LEFT: As with Stratus, a steel building system not only contributed to LEED through the recycled content aspect, but also offered economy and availability, plus flexibility for future expansion for Steelcare.*  
*IN CIRCLE AT LEFT: South elevation of warehouse showing SOLARWALL®.*

spans in the production area."

And the fact that the project earned Silver LEED certification attests to the role steel can play in tomorrow's increasingly environmentally conscious construction industry.

**A**nother project to pursue LEED certification is the 7827m<sup>2</sup> (83,270 sq. ft) Plant 19 Transfer Facility for Steelcare Inc. of Hamilton in Burlington, Ontario.

It involved a pre-engineered steel building system (SBS) by Butler Buildings Canada, supplied and erected by Abcott Construction Ltd. The



Stratus Winery - Wall Detail at Roof.



## Design and Construction Teams

### Stratus Winery:

**OWNER:** David Feldberg

**ARCHITECT:** Andrew Incorporated Architect 905-468-0611

**CONSULTING ENGINEER:**  
Sandwell Consulting Engineers Ltd. 905-319-1688

**CONSTRUCTION MANAGER:**  
Newman Bros. Limited 905-641-8111

**STEEL BUILDING SYSTEM SUPPLIER:**  
Behlen Industries LP 1-800-663-7538

**PHOTOGRAPHER:** Vyta Beniusis

### Steelcare:

**OWNER:** Steelcare Inc. 905-529-2273

**ARCHITECT:** Chamberlain Architectural Services Limited 905-631-7777

**STEEL BUILDING SYSTEM SUPPLIER:**  
Butler Buildings Canada 905-332-7786

**CONTRACTOR:** Abcott Construction Ltd. 519-756-4530

**WALL CLADDING SUPPLIER:** Agway Metals Inc. 1-800-268-2083

**PHOTOGRAPHER:** Vyta Beniusis

## ACTIVE SOLAR AIR HEATING SYSTEM

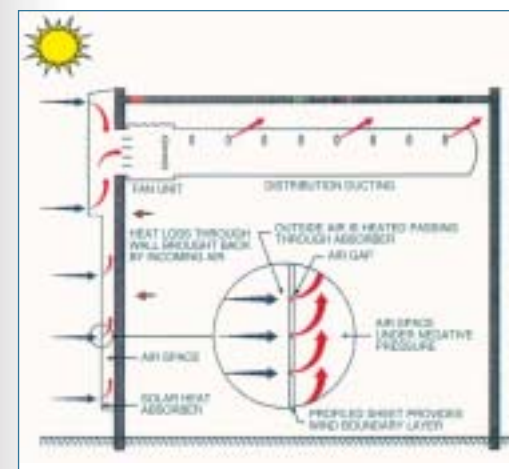
# Galvanized Steel Solarwall

## Reduces Building Energy Consumption

**E**nergy from the sun is for the taking and a 34,465 m<sup>2</sup> (371,000sq.ft) Boucherville, Quebec warehouse stands to save as much as C\$19,000 a year in heating costs with a trademark system called Solarwall that uses passive solar energy to preheat building air.

Developed by Conserval Engineering

Ltd. of Toronto and Buffalo, and distributed in eastern Canada by Energy Matrix Inc., in Kirkland, Quebec, Solarwall is a second wall with an air space between the wall and the building wall and integrates seamlessly with architecture and is made of medium to dark-coloured galvanized or Galvalume™ steel as the solar collector, which is unglazed. The porous surface of the Solarwall panel has tiny openings that allow air to pass through, picking up virtually all the solar heat reaching the steel panel. The 0.455mm (.0179") pre-painted galvanized or Galvalume™ steel Solarwall® panels are available in a selection

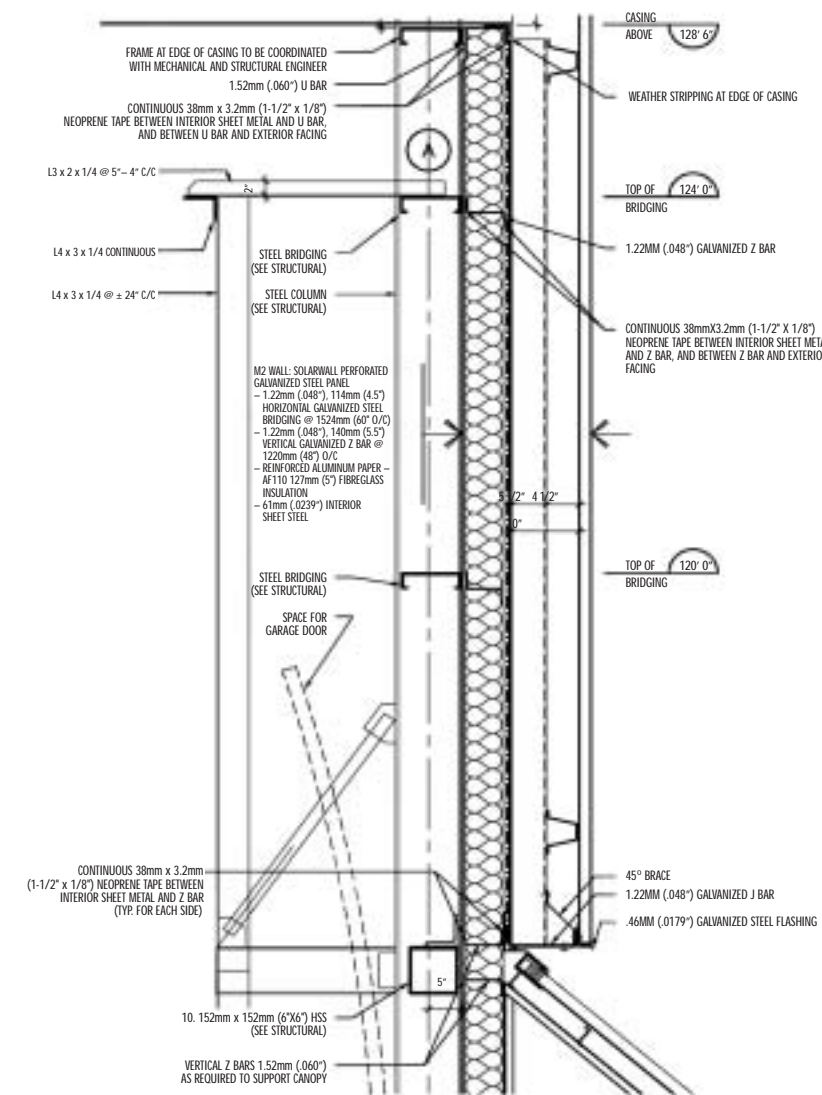


ABOVE: Diagram showing how the Solarwall system works. (SD 2-00 P14)

LEFT: The unglazed, porous surface has tiny openings to allow air to pass through, picking up virtually all the solar heat reaching the steel panel.

of dark 8000 Series paint colours. A fan creates negative pressure in the wall cavity to draw air through the holes to capture the steel cladding's heat as it enters, thus pre-heating the air entering the building's facade and mechanical system. The architecturally integrated system forms part of the buildings fabric, as the Solarwall panels attach to the metal channels that create a plenum space over conventional stud or masonry walls.

The Boucherville warehouse, owned by groceries distributor Colabor, has a (836m<sup>2</sup>) 9,000 square-foot Solarwall®. The panels in this application are made from 0.455mm



(.0179") galvanized steel coloured QC8252 was chosen because of the modern look, speed of construction, and high insulating factor required for refrigerated buildings. On a typical -10°C winter day, the preheated air drawn into the warehouse's heating system might reach 17°C.

### Design and Construction Team

<b>CLIENT:</b> Colabor Inc., Boucherville, QC. 450-449-4911	<b>CLADDING INSTALLER:</b> Les Revetements RHR 514-359-7868
<b>ARCHITECT &amp; PROJECT MANAGER:</b> Gross Kaplin and Coviensky Architects. 514-736-3636	<b>STEEL ERECTION:</b> Economic Structural Steel 514-648-4059
<b>GENERAL CONTRACTOR:</b> Axor 514-846-4000	<b>SOLARWALL DISTRIBUTOR:</b> Energy Matrix, Kirkland, QC. 514-630-5630
<b>STRUCTURAL ENGINEER:</b> Gerin Lajoie 514-279-4821	<b>CONTRACTOR:</b> Abcott Construction Ltd (519) 756-4530
<b>CLADDING SUPPLIER:</b> Conserval Engineering from Agway Metals Inc 1-800-268-2083	<b>SOLARWALL SYSTEM DESIGN :</b> Conserval Engineering 416-661-7057



ABOVE: The architecturally integrated prepainted galvanized or Galvalume™ steel Solarwall® system forms part of the buildings fabric.

LEFT: In this era of 'tight building' envelopes and increased ventilation rates, Solarwall technology can integrate seamlessly with architectural requirements.

Jonah Amitnaaq School and Community Centre  
Baker Lake, Nunavut

# Prepainted Steel Cladding & Light Steel Framing



*Overlooking Baker Lake, the building's gently arching contour is in perfect harmony with its uniquely central location in the community.*

## combat *harsh conditions*

The geographic centre of Canada, Baker Lake, is the only inland Inuit community in Canada, with access by water to Hudson Bay through Chesterfield Inlet.

The concept for the new 4,580m<sup>2</sup> (49,300 sq. ft) school, occupied since August 2004, 'Broad Horizons', relates to the school's location adjacent to Baker Lake, as well as the ideals of the educational process.

**T**he gentle arching plan of the school takes advantage of the school's location central to the community overlooking Baker Lake. A central triangular shaped atrium punctuated by a central stair and bridge, expands outward toward the lake in both plan and section. The school is designed to function both as a school and as a community library. After hours both the library and gymnasium can be accessed directly from the entrance vestibule without entering the rest of the building.

The foundation is built on 141mm (5-1/2") diameter rock socketed piles elevating the school over a sloped site and allowing the community area snow melt to drain below. Access is provided by a series of galvanized steel stairs and ramps.

### Good Building Practice Guidelines

The Nunavut Government has prepared guidelines for good building practice for northern facilities to assist designers with reducing problems and eliminating past mistakes. Building overhangs are discouraged and special attention is encouraged regarding mechanical air intakes and exhausts regarding ice build-up and infiltration of fine blowing snow.

The new school reflects these guidelines. Massing is straight forward without overhangs. The envelope design is simple, sheathing to the

walls, soffit and roof is covered in a continuous air-vapour barrier with semi-rigid non-combustible insulation and prefinished steel on girts and clips on top. Outside field painting to wood or metal does not last in this dry harsh climate. To reduce maintenance and achieve a long-lasting finish, Architects Smith Carter of Winnipeg selected prefinished steel for exterior walls, soffit and roof and galvanized steel for exterior ramps, handrails and canopy extensions.

Elevations are enlivened by a variety of prefinished steel profiles, colours and finishes. The majority of the facade is clad in 7/8" corrugated Z275 galvanized steel panels in .66mm and 0.81mm (.026" and 0.032") HMP Series Regent Grey QC6082, 0.81mm (0.032") 10000 Series, Twilight Blue QC3644 and 0.81mm (0.032") Metallic Series Bright Silver QC2624.

Flat prefinished steel panels are also used to provide a contrasting texture at window areas. Primrose Yellow QC3729 is used between windows, with Silver

1, 2, 3  
Due to the harsh climate Architects Smith Carter, selected prefinished steel for the exterior walls, soffit and roof and galvanized steel for the exterior ramps, handrails and canopy extensions.

4  
The foundation is built on 141mm (5-1/2") diameter rock socketed piles elevating the school over a sloped site.

5  
The entrance vestibule showing vierendeel truss bridge, long throw diffusers and steel decking.

6, 7  
The library and gymnasium can both be accessed after hours directly from the entrance vestibule, without entering the remainder of the building.





# INTERNATIONAL FIBRE CENTRE, DEAKIN UNIVERSITY, GEELONG, AUSTRALIA Pre-Painted Steel Insulated Sandwich Panels Contribute to Economy & Speed of Erection

The International Fibre Centre is a research and testing facility dedicated to the study of wool processing techniques from shearing to spinning. The striking structure is clad entirely in 7000m<sup>2</sup> (75,350 sq.ft) of pre-painted Zinalume<sup>®</sup> steel (Galvalume<sup>™</sup> in Canada), insulated sandwich panels, in the Metallic Series and coloured Surfmist. These vapour tight panels are installed on a frame constructed from standard steel sections (this is somewhat similar to the Art Gallery of Hamilton SD 1-2005). The design ensures economy and speed of erection. As Hamish Lyon of SKM says, the decision to use steel architectural panels was primarily founded on practical grounds. "The

budget and construction timeline for the project were very tight", he says. Maintenance is facilitated by the precision and factory finish of the pre-painted steel envelope that provides the structure a smooth, clean, sharp, ultra-modern appearance. The project follows the contours of the sloping terrain and its segments interlock to form a jagged outline of inclined planes creating a saw-tooth roof configuration.

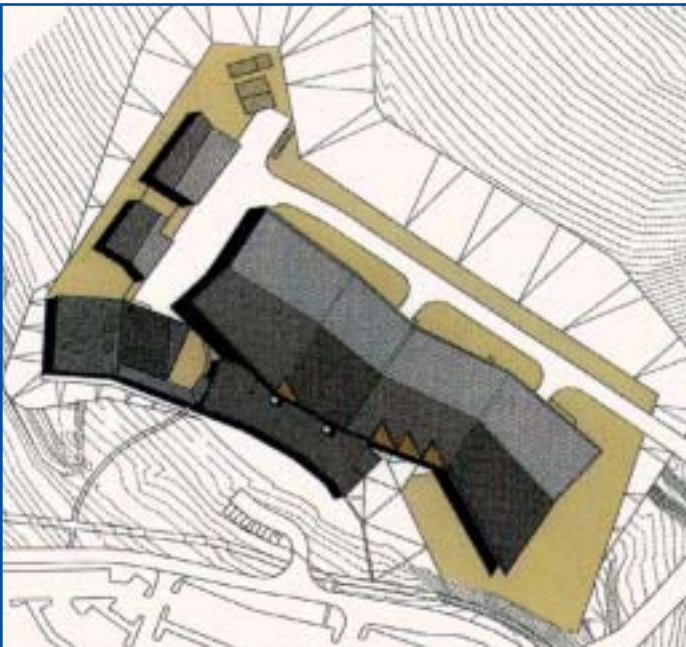
*Zinalume<sup>®</sup> is a registered trademark of BIEC. Reprinted with permission courtesy International Iron and Steel Institute. Galvalume<sup>™</sup> is a registered trademark of Dofasco in Canada.*



Testing hall façade



General view



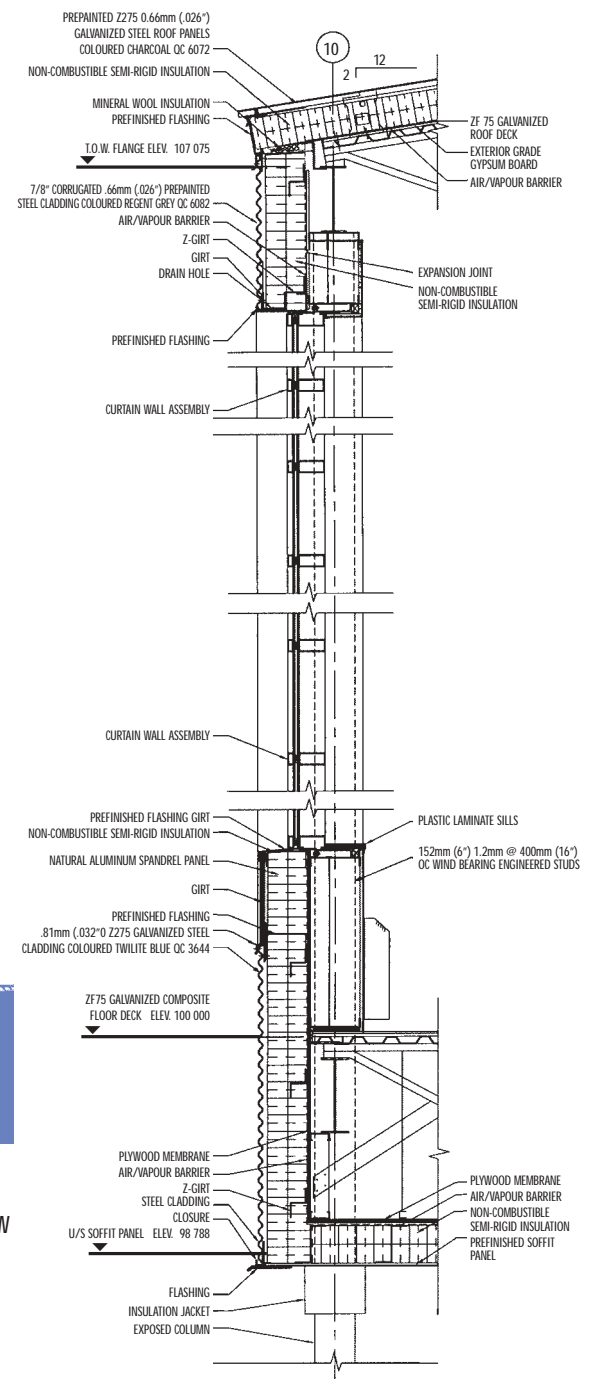
Site plan



Roof light in a roof valley

**ARCHITECTS AND ENGINEERS:**  
Sinclair Knight Merz Architects

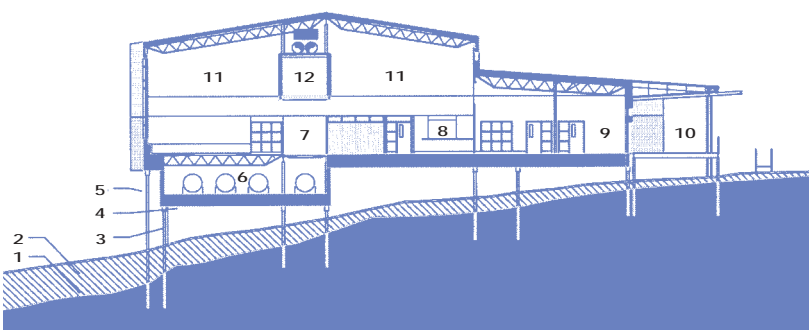
**PHOTOGRAPHY:**  
SKM Architects



**Wall Cladding**  
7/8" Standard Corrugated Panel, 0.032, HMP Series Regent Grey QC6082 (16115 sq ft)  
7/8" Standard Corrugated Panel, 0.032, 10000 Series Twilight Blue QC3644 (11746 sq ft)  
7/8" Standard Corrugated Panel, 0.032, Metallic Series Bright Silver QC2624 (3500 sq ft)

Metallic QC2624 located in strips below windows to accentuate the horizontal lines of the school. The roof assembly including the 0.66mm (0.026") Z275 galvanized TSR roof panels coloured Charcoal QC6072 are placed on 3,836.6m<sup>2</sup> (41,298 sq. ft) of ZF75 galvanneal coated .76mm (.030") RD938 acoustic steel deck and 3,430m<sup>2</sup> (36,921 sq. ft) of ZF75 galvanneal coated .76mm (.030") RD938 steel roof deck. Also used in the school was 300m<sup>2</sup> (3224 sq ft) of .76mm (0.030) ZF75 galvanneal coated HB938 composite floor deck.

Light steel framing (LSF) was used rather than wood for exterior walls and interior partitions to avoid problems of drying and twisting, as well as for fire protection. The size of the building required it to be divided by a firewall. Firewall design uses LSF shaftwall technology and thermo-fusible aluminum clips, to CAN4/ULCS101-M.



- 1. BEDROCK
- 2. GRAVEL OVERBURDEN
- 3. SECURITY MESH
- 4. INSULATED SOFFIT
- 5. ROCK-SOCKETED PILES
- 6. TANKAGE LEVEL
- 7. CORRIDOR
- 8. ADMINISTRATION WINDOW
- 9. VESTIBULE
- 10. ENTRANCE
- 11. ATRIUM
- 12. ENCLOSED BRIDGE

## Design and Construction Team

<b>OWNER:</b> Government of Nunavut	<b>CIVIL:</b> Neegan Burnside 204-949-7110	<b>STEEL CLADDING, ROOF &amp; DECK SUPPLIER:</b> VicWest 204-669-9500
<b>CONTRACTOR:</b> Sanajit Construction (1998) Ltd. 867-645-2753	<b>SNOW DRIFTING:</b> RWDI 519-823-1311	<b>STEEL STUD MANUFACTURER:</b> Bailey Metal Products 1-800-668-2154
<b>ARCHITECTURE, INTERIOR DESIGN, STRUCTURAL, MECHANICAL &amp; ELECTRICAL:</b> Smith Carter Architects & Engineers Inc. 204-477-1260	<b>QUANTITY SURVEYOR:</b> Hanscomb 613-234-8089	<b>LIGHT STEEL FRAMING SUPPLIER:</b> Umingmak Supplies Ltd. 1-800-665-0159
	<b>STRUCTURAL STEEL FABRICATION AND INSTALLATION:</b> KEW Steel Fabricators Limited 905-563-8245	<b>PHOTOGRAPHERS:</b> Peter Bacler, Guy Dupuis

PARK ROYAL SHOPPING CENTRE,  
THE VILLAGE, WEST VANCOUVER, BC.

# Steel helps THE New LOOK Old

**I**t is not uncommon to take an old building and renovate it to look like new. We see it all the time in the pages of this publication – usually applying light steel framing (LSF) and cladding to achieve the desired effect.

We chose steel cladding for its appearance and durability. We didn't value-engineer it out in terms of cost – it was what we wanted for the aesthetics.

John Moorcroft,  
Musson Catell McKay Partnership

But how often do you find someone making a new building look old? And using light steel framing (LSF) and prepainted steel cladding to help them!

That's what happened between May and September of 2004 at the west end of

called 'The Village' is an extension to the mall. It is the product of joint venture collaboration between F&A Architects of Pasadena, California and Musson Catell McKay Partnership (MCMP) of Vancouver, BC.

John Moorcroft, Associate and Project Architect at MCMP tells us, "The design concept was not to match the existing mall, but to create a stand-alone 'village' with a subtle nautical theme. The idea is for it to look like a 100-year-old fishing village that was renovated."

#### Funky, random and eclectic

The Village evokes a 'Main Street' feel with its single, winding street and 250,000 sq. ft. of retail space contained in seven free-standing buildings. Each building is markedly different

'The Village' is an extension to Park Royal in West Vancouver, Canada's first ever shopping mall. The aesthetics have been described by visitors as 'funky', 'random', 'eclectic' – effects achieved by the combination of colours, architectural shapes and a wide variety of materials. Prefinished Galvalume™ cladding and unpainted Galvalume Plus™ standing seam roofing deliver both durability and pleasing aesthetics.

in terms of its appearance. The aesthetics have been described by visitors as 'funky', 'random', and 'eclectic' – effects achieved by the combination of colours, architectural shapes, and a variety of materials including light steel framing (LSF), wall cladding in tan, red, blue, and unpainted Galvalume Plus™ (see sidebar) profiled standing seam roofing, brick, stucco, and Hardy Plank. As well, tenants have been allowed to customize their storefronts, creating the impression of something that's evolved rather than stamped out with a predetermined cookie cutter.

Public reaction to The Village is very favorable with shoppers saying, "We love it!" And, "It's so different from what you normally see." They like the small town feel of parking outside the store you're visiting.



#### Wall Cladding:

Roll Form Group: S175 SB profile .66mm (.026") thick AZ150 Galvalume, painted with the 8000 Series paint system.

695m<sup>2</sup> (7500 sq. ft.) Cabec Green QC 8166

372m<sup>2</sup> (4000 sq. ft.) Briarwood Tan QC8331

47m<sup>2</sup> (500 sq. ft.) Slate Blue QC 8260

790m<sup>2</sup> (8500 sq. ft.) Dark Red QC 8250

418m<sup>2</sup> (4500 sq. ft.) Heron Blue QC 8330

#### Roof Cladding:

2973m<sup>2</sup> (32,000 sq. ft.) AZ 180 Galvalume Plus

#### Steel Deck:

VICWEST - 6038m<sup>2</sup> (65,000 sq. ft.) .0239"; .048"; .036" & .0299;

Galvanneal ZF075, plus a small amount of galvanized Z275



### Design and Construction Team

#### ARCHITECTS:

Musson Catell McKay Partnership  
604-687-2990

#### GENERAL CONTRACTOR:

Bird Construction Company Ltd.  
604-271-4600

#### STEEL CLADDING SUPPLIER:

Roll Form Group  
1-800-233-6228

#### STEEL DECK SUPPLIER:

VicWest 1-800-387-7135

#### STEEL CLADDING INSTALLER:

Lam Metal Contracting Limited  
604-430-3233

#### LIGHT STEEL FRAMING SUPPLIER:

Bailey Metal Products  
1-800-668-2154

#### LIGHT STEEL FRAMING INSTALLER:

Centura Building Systems Ltd.  
604-523-6188

#### PHOTOGRAPHER:

Derek Lepper Photography  
604-760-9910

## New Roof? Cool!

Is this august publication allowing use of the vernacular which anyone with kids knows has rescued 'cool' from the hippiedom of three decades ago? Not a chance! We're talking roofing. Cool Roofing to be exact. The way of the future.

### CMRC Members:

**AISI**  
(American Iron & Steel Institute)

**NAMZAC**  
(North American Zinc-Aluminum Coaters Association)

**NCCA**  
(National Coil Coating Association)

**MBMA**  
(Metal Building Manufacturers Association)

**MCA**  
(Metal Construction Association)

If you summered among the Great Lakes this year you know what hot is all about. If you were in Toronto or other large city you likely experienced the 'urban heat island' phenomenon. That's when energy absorbing dark building materials and pavements, and precious little vegetation, result in ambient temperatures higher than the surrounding areas, sometimes by as much as 7°C.

California, besieged by energy problems including brown-outs, is not surprisingly the driving force behind the search for solutions. Given that buildings consume one-third of all energy and two-thirds of all electricity generated, construction is an obvious target. Thus was born Cool Roofing and the Cool Metal Roofing Coalition (CMRC).

Cool Roofing standards are a component of the LEED™ (Leadership in Energy

and Environmental Design) program, and like LEED, have migrated north of the 49th. They pertain to solar infra-red radiation (IR) reflectance and emittance, also referred to as emissivity, as they apply to metal roofing. They are designed to reduce A/C energy use by increasing the amount of radiation reflected away from a roof's surface, and also the amount of absorbed heat emitted back into the night sky.

The CMRC (see sidebar) mandate includes managing Cool Roof requirements, educating and informing appropriate audiences, and contributing to, and so influencing, any legislation that might be on the horizon.

Currently Canadian Cool Roof standards mirror those in the U.S. which is less than ideal due to climatic differences. However, Canadians like Dofascos Ken de Souza who represents the American Iron and Steel Institute (AISI) on the Board of CMRC, are lobbying for standards that make sense up here as it seems likely they will become legislation at some point. Whereas the southern U.S. is a 'cooling climate', Canada is a 'heating climate'. Consequently our roofs have far more insulation. Our challenge is to find the optimal trade-off between the seemingly incompatible goals of heat reflectance/emittance and retention in winter.



These photographs represent typical applications.

The Cool Roof values currently in effect are based on mathematical models calculated at the Oak Ridge National Research Laboratories in Tennessee. Another of Ken De Souza's lobbying efforts is to have more Canadian data built into the models.

Improvements to reflectance and emissivity are being achieved through new paint technology in terms of composition and pigments. Polymer paints with Cool Roof properties are readily available in Canada as all the major paint manufacturers now produce them. Baycoat, Dofascos joint venture coating facility is fully capable of applying them to galvanized and Galvalume™ steel substrates to provide the best available solutions to Canadian Cool Roof challenges at this time. A perfectly reflective material would have a solar reflectance of 1 (100% radiation reflectance). Few commercially available materials meet the most stringent Cool Roof reflectivity ( $\geq 0.65$  low slope and 0.25 for steep slope) and emissivity ( $\geq 0.90$ ) benchmarks. Not surprisingly white and very light colours achieve the highest ratings. And in case you are wondering, unpainted metal had decent reflectance but poor emissivity. Roof profile is not a factor.

With modifications for our climate, Cool Roofing can provide energy savings and reduce the smog associated with urban heat islands and pollution from utility plants. And research shows that steel roofing retains solar reflectance over time better than any other roofing products. ■

## New Vicwest Facility to manufacture Insulated AccuWall® Foam-Steel Panels

VICWEST plans to create a new state-of-the-art facility in Ontario to produce its proprietary ACCUWALL® factory-insulated steel panels.

In early 2006 the fully automated manufacturing plant will begin producing precision-manufactured panels that eliminate job-site waste and reduce installation time for the architectural, commercial, industrial, food processing, refrigeration and cold storage markets. "The product answers the market's demands for lightweight, high-strength cladding that's environment-friendly and energy efficient," says Bob Skull, President and CEO of VICWEST. The panels polyurethane insulation is CFC-free and helps achieve R-values up to R-45.

ACCUWALL® panels for exterior and interior walls, rooftops, suspended ceilings and interior partitions are designed for new and retrofit applications in widths of 24 to 42 inches, thicknesses of 2 to 6 inches, roll-formed into a wide variety of profiles.

VICWEST supplies and distributes metal cladding, roofing and decking for industrial, commercial, institutional, architectural, agricultural and residential markets in Canada. Contact: Eugene Pasiecznik at 1-800-387-7135 ■

## Stanford Downey Architects Inc. – design innovative Casino Bridge.

### Hollow Steel Sections Contribute to Light Transparent Bridge

The new 27 metre (90 ft) pedestrian bridge crossing Fallsview Blvd. at a height of 6 metres (19-1/2 ft), links the Niagara Fallsview Casino to the Hilton and Renaissance Hotels. Fabricated and painted in Quebec, the main bridge arrived in Niagara Falls in 5 pieces. What's truly unique about the construction of the bridge is that the 27 metre (90 ft) steel frame was lifted into place and assembled in one day by Niacon Construction on March 2nd. The light, transparent bridge links into a circular rotunda on the hotel

side and splits off into secondary bridges to the respective hotels. The bridge was fabricated from hollow steel sections (HSS) Grade A252 and incorporates state of the art LED lighting technology. The glass enclosure which simply sits on the steel cross beams and concrete deck, is not laterally braced, it is completely independent of the bridge steel except for vertical bearing. The glass enclosure is a structurally glazed skylight construction supplied by IBG Canada.

All mechanical and electrical services (ventilation, lighting, etc.) are fed from the underside of the bridge allowing the pedestrian enclosure to be completely transparent. ■



ABOVE: The steel tubing for the main arches is HSS 406mm x 13mm (16" x 1/2") AESS with longitudinal tie rods of HSS 219mm x 6.5mm (8-1/2" x 1/4") AESS.

RIGHT: The tension rods between the main arch, and the HSS 203mm x 152mm x 9.5mm (8" x 6" x 1/3") tie rod cross beam assembly were a MacAlloy 460mm (18") bar system.



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## The Bentley Upper School Gymnasium

In Oakland, California is one of seven structures, part of an upgrade of the schools facilities, developed by Kava Massih Architects. "In order to mitigate the monolithic quality of most gyms, the architects use a continuous clerestory window to support a cantilevered steel roof shell, floating above the rest of the building". (Arch' Record 3/04)

Architects – Kava Massih Architects ■



Gymnasium Front and Rear

## 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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