ArcelorMittal

Steel Design

FALL 2008 | VOLUME 40 | NO. 2

The Best of Both Worlds:

Port of Entry – Alberta & Montana

A View to Healing:

Qikiqtani General Hospital Iqaluit, Nunavut

Prepainted Galvalume:

Selected for Functional and Environmental reasons

Environmental Construction:

Light Steel framing in the Building Environment

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Steel Design

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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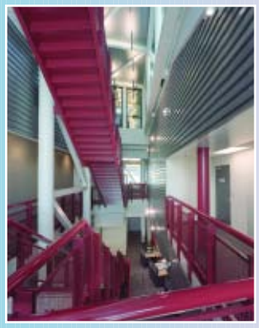


COVER PHOTO – PORT OF ENTRY – ALBERTA AND MONTANA: TIMOTHY HURSLEY

ArcelorMittal

transforming tomorrow

IN THIS ISSUE

CHESTER RCMP DETACHMENT, CHESTER, NOVA SCOTIA

Prepainted Galvanized Steel *Environmentally Friendly*

NORTH ELEVATION

The Chester RCMP Detachment in Chester Nova Scotia received a positive response from the community. People from the area had input in the initial design stage to ensure that it fit aesthetically with the open landscape of the local environment.

Architecture 2000 Inc. designed the new facility based on a design prototype they developed together with the RCMP, Public Works and Government Services Canada. This was in response to a new RCMP philosophy and mandate to create a productive work environment for the employees using sustainable building systems and building materials for both the interior and exterior to suit the local environment. The initial prototype design, used for a project in Amherst, Nova Scotia, earned the Nova Scotia Lieutenant Governor Award as well as the Deputy Minister Award of Excellence.

"Steel was chosen for the 935 sq. ft. facility because it's an environmentally friendly building material, it is recyclable and low maintenance, steel is non-combustible and that was an important fire-rating requirement and it has a long life," says Raven Spanier, Architecture 2000.

The bright royal blue, pre-painted galvanized steel – used for the fascia and soffit of the curved portion of the roof, the canopy as well as for the wall cladding – expresses strength and is a complementary accent to the cedar shake chosen for the rest of the building.

George King of Avondale Construction, the project General Contractor and on-site superintendent, emphasized that from a visual perspective standpoint the steel worked well with the cedar shake. "Steel has an advantage from a maintenance standpoint – you just have to hose it down to clean it. We preferred working with the steel, it was much easier and quicker to install than the cedar and it's not as labour intensive," says King, adding that Flynn Canada did a "bang up job" of installing the material.

Steel was also used on the accompanying garage on the property, which is a smaller version of the RCMP building.

The elevated central core area brings in natural light and it separates private and public corridors which lead to work, support and detention areas.

CLADDING MATERIAL:

Wall & Roof are 0.76mm (.0299") and **Soffit** is 0.45mm (.0179") prepainted galvanized coloured QC 8790 Royal Blue

Walls: 22.2mm (7/8") Corrugated CL5022R profile – 140m² (1,500 sq. ft.)

Roof Canopy: Tradition profile – 465m² (5,000 sq. ft.)

Soffit: CL7015 profile – 93m² (1,000 sq. ft.)

Design and Construction Team

ARCHITECT: Architecture 2000 Inc. 506-383-8500
GENERAL CONTRACTOR: Avondale Construction 902-275-2309
STEEL CLADDING SUPPLIER: Vicwest 506-857-0057
STEEL CLADDING ERECTOR: Flynn Canada 506-855-3340
STRUCTURAL: Campbell Comeau Engineering Ltd. 902-429-5454
MECHANICAL/ELECTRICAL: Scriven Associates 902-429-0701

PORT OF ENTRY – COUTTS, ALBERTA AND SWEETGRASS, MONTANA

The Best of *Both Worlds*

Main Port building viewed from the East, showing the US portion on the left and Canadian on the right. The facing sloped and vertical surfaces, as well as, the horizontal cladding are .76mm (.0299") prepainted galvanized coloured QC6904 Silver Grey in the Metallic Series. The fascia on the bridge prepainted Z275 galvanized coloured QC6724 Silver, also in the Metallic Series.

This is a first for Steel Design – a building straddling the Canada-USA border and not by accident! A joint Port of Entry between the town of Coutts, Alberta and Sweetgrass, Montana, the facility links Interstate I-15 from the States with Highway 4 to Calgary and Edmonton on the Canadian side. Situated on a 23 acre site, the 9,290m² (100,000 sq. ft.) Port sees over a million people and approaching half-a-million trucks a year pass through. The border is the centre line of a steel 'bridge' running through the main building as a circulation spine and access to parking.

The adjective 'joint' applies not only to design and construction phases, but also the ongoing daily operations for the clients: Canada Border Services Agency (CBSA) and US General Services Administration (GSA). Initially, a design consultant from Los Angeles provided Bridging Documents comprising technical performance specifications and drawings approximately 25% complete. The Calgary branch of Bird Construction of Toronto was the Canadian GC for this design/build project and hired Kasian Architecture Interior Design and Planning Ltd. of Edmonton who complemented the input of CBSA architect Dane Ashlie. The applicable codes and standards for each side of the border had to be observed. Work was executed by contractors and sub-contractors on their respective sides – with the added challenge of meeting at the right place at the right time! Today, CBSA and GSA staff while working in their own halves of the main Port building share its lunchroom facilities, locker rooms, conference rooms, and other areas.

Canadian Main Port (3 storey) building viewed from the North.

The facility comprises the main building of three storeys and 6,000m² (64,584 sq. ft.) and six ancillary structures including inspection

View from the North – showing (R to L) the overhead pedestrian bridge and Canadian Main Port Building, Inspection Booths and Commercial Inspection Building. Highway #4 Southbound is on the right and Northbound on the left.

Overview of entire Canadian Port of Entry viewed from the North West.

Design and Construction Team

OWNERS:
U.S. General Services Administration and
Canada Border Services Agency

ARCHITECT:
Kasian Architecture Interior Design and Planning Ltd. 780-454-4477

STRUCTURAL ENGINEERS:
Read Jones Christoffersen Ltd. 403-283-5073

GENERAL CONTRACTOR:
Design Build – Bird Management Ltd. 403-319-0470

CONSTRUCTION MANAGER: Abide International Construction and Management Services 707-935-1577

ROOFING & CLADDING INSTALLER:
Thermal Systems KWC Ltd. 403-250-5507

ROOFING & CLADDING SUPPLIER: Vicwest 780-454-4477

LIGHT STEEL FRAMING MANUFACTURER:
Bailey Metal Products 1-800-668-2154

LIGHT STEEL FRAMING SUPPLIER: Don's Drywall 403-328-3535

LIGHT STEEL FRAMING & DRYWALL INSTALLER:
Roest Acoustics 403-327-2501

ROOF & FLOOR DECK SUPPLIER & INSTALLER (CANADA):
Custom Metals 403-291-9767

STRUCTURAL STEEL SUPPLIER & INSTALLER:
Anglia Steel 403-720-2363

The exterior design objectives were to echo the aesthetic of the surrounding prairies and farmland. The Silver Grey and Silver prepainted Z275 galvanized steel cladding was sleek and modern while reflecting the 'feel' of farm buildings and silos in the area.

buildings and hazmat storage. It has won eight awards and is the first Can-US border station to be LEED® certified. Achieving that involved meeting appropriate criteria for issues such as construction waste recycled (98%), water use reduction (22%), materials manufactured within 500 miles (47%), occupied spaces with outside views (96%), and others relating to site usage, energy and atmosphere, building materials and more.

Building materials included structural steel joists, prepainted galvanized wall and roof cladding, steel floor decking and roof deck. Light steel framing (LSF) was used for exterior load- and wind-bearing walls and interior partitioning for drywall. John Roest of Roest Acoustics who did the LSF framing and drywalling says, "LSF was used because of speed of construction, cost, and light weight."

The exterior design objectives were, according to Kasian architect Ken Mah, "…to echo the aesthetic of the surrounding prairies and farmland. Silver grey steel wall and roof cladding used horizontally and vertically was chosen to achieve that. It was sleek and modern while reflecting the 'feel' of farm buildings and silos in the area. Overall I would say steel cladding and LSF generally offer great flexibility in terms of use and expression."

SHEET STEEL MATERIALS USED

Wall Insulation:
Batt insulation over poly vapour barrier

Roof Insulation:
Batt with peel and stick membrane under it and the Z girts

Roof and Vertical Wall Cladding:
Tradition 275 – .76mm (.0299") (SSR) panel
Pan size: 396mm x 66mm (15-3/5 x 2-3/5")
Prepainted Z275 (G90) galvanized Metallic Series*
QC6904 Silver Grey 7,060m^2 (76,000 sq. ft.)

Horizontal Wall Cladding:
CL938 Type 1 – .76mm (.0299")
Prepainted Z275 (G90) galvanized Metallic Series*
QC6904 Silver Grey 780m^2 (8,400 sq. ft.)

CL3070 Type 2 – .76mm (.0299")
Prepainted Z275 (G90) galvanized Metallic Series*
QC6904 Silver Grey 3,016m^2 (32,500 sq. ft.)

Interior liner:
Tradition 275 Type 1 – .76mm (.0299")
Prepainted Z275 (G90) galvanized Metallic Series*
QC6904 Silver Grey 1,300m^2 (14,000 sq. ft.)

Fascia and Soffit:
AD300 Type 3 – .76mm (.0299")
Prepainted Z275 (G90) galvanized Metallic Series*
QC6724 Silver 3,016m^2 (32,500 sq.ft.)

Light Steel Framing:
Exterior Walls:
203mm x 1.22mm (8" x .048") MPA340 (Grade 50)

Interior Walls:
152.4mm x .91mm (6" x .036")
92mm x .46mm (3-5/8" x .018")
152.4mm x .46mm (6" x .018") MPA230 (Grade 33)

Security Area: plus expanded mesh
152.4mm x 91mm (6" x .036") MPA230 (Grade33)

*A 4-coat Kynar based system

Central main stairs serving all three floors of both the US and Canadian portion of the Main Port building. The international border runs through the centre of the stair shaft/corridor with Canada on the left and the US on the right. The horizontal wall cladding is Vicwest's CL3070 profile, prepainted Z275 galvanized coloured QC6904 Silver Grey.

EASTBOURNE ESTATES, GEORGINA, ONTARIO

Fifthshire Homes Leaders in Environmental Construction

Light Steel Framing in the Building Environment

The EnviroHome initiative was established in 1994 by the Canadian Home Builders' Association and TD Canada Trust to recognize and support innovative new homebuilders who offer consumers homes that are better for the homeowner, the community and the environment. As Michelina DiCarlo, Executive Vice-President Fifthshire Homes, emphasizes, "The Eastbourne Estates EnviroHomes on Lake Simcoe represent a determination to provide the very best to consumers and to do our part to alleviate the impact that traditional home building tends to have on the environment and community."

Eastbourne Estates, located in Georgina on the shores of Lake Simcoe, feature 223 to 371.6m² (2,400 to 4,000 sq. ft.) New England style, R-2000 EnviroHomes on 3/4 acre to 1-1/2 acre lots.

Fifthshire Homes

SPECIFICATIONS:

Floor Joists:
254mm (10") stud 41.3mm (1-5/8")
flange 13.7mm (.054")
MPA340 (Grade 50)

Exterior Wall Studs:
92mm (3-5/8") stud 41.3mm (1-5/8")
flange 1.09mm (.043")
MPA340 (Grade 50)

Interior Wall Studs:
92mm (3-5/8") stud 41.3mm (1-5/8")
flange .84mm (.033")
152.4mm (6") stud 41.3mm (1-5/8")
flange .84mm (.033")
92mm (3-5/8") stud 31.75mm (1-1/4")
flange .457mm (.018")
All MPA230 (Grade 33)

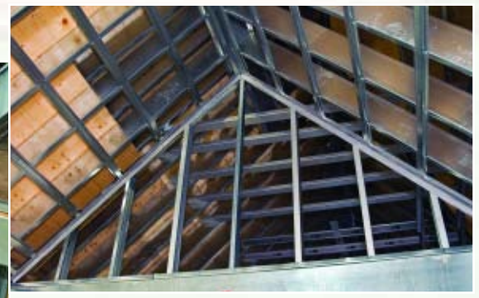
Roof Framing Ceiling Joist Roof Rafters:
203.2mm (8") stud 41.3mm (1-5/8")
flange 1.09mm (.043")
254mm (10") stud 41.3mm (1-5/8")
flange 1.37mm (.054")
MPA340 (Grade 50)

There are two major aspects to the EnviroHome from a steel perspective: 1) Improved indoor air quality because steel does not support the growth of mould or off gas. and 2) Steel's very high recycled content earns the highest LEED Platinum Points.

"If you can dream it, we can build it." That's the motto of Fifthshire Homes, a premier custom builder of steel framed registered R-2000 EnviroHomes. Over 18 years ago, Joe Vella, Vice-President, Fifthshire Homes, constructed the first all-steel R-2000 home in Canada. "R-2000 is one of the highest technical standards in the world for new housing that ensures homes are more comfortable and energy efficient with better indoor air quality and quality of construction," emphasizes Joe.

Over the years, Fifthshire has earned numerous awards for their leadership and commitment to energy efficiency, including in June 2008, a Certificate of Recognition from Peter Love, Ontario's Chief Energy Conservation Officer for their EnviroHome project, Eastbourne Estates. Each year, the EnviroHome designation is given to a select number of new home projects across Canada. To qualify, each home must be certified to the R-2000 Standard and include additional air quality and environmental features beyond what the R-2000 program requires.

There are five models, all constructed with light gauge steel framing, supplied by Bailey Metal Products. The subdivision will include 30 EnviroHomes and will be ready for occupancy in December 2008.



From the construction perspective the advantage of lightweight steel is that it allows for easier and more expeditious assembly and any scrap remaining is recyclable. It also has the strength to withstand some of the worst environmental conditions.

Enviro Homes

The exterior walls consist of structural 92mm (3-5/8") steel studs with a high-grade exterior insulated wall sheathing. More than 98.4% of the cavity wall is filled with Polyicynene insulation, an environmentally safe material.

The EnviroHomes feature leading design elements, including energy efficient products and materials, such as steel, which allows greater flexibility during design, construction and remodeling. "Steel allows for more open space and larger rooms and is more energy efficient," comments Joe.

Light gauge steel framing was used to frame the floors, walls, ceiling joists and all the roof rafters of the homes in Eastbourne Estates. The basements feature steel beams and columns and the exterior doors and overhead garage doors are also made of steel. "The reason I use steel in my homes is that it gives our customers perfectly straight walls and quiet floors, in addition to the important aspect of improved indoor air quality because, steel is inert and does not off gas or support the growth of mould in higher moisture areas. "The use of exterior insulated sheathing R-10 with the 98% cavity filled with high expansion foam is used to reduce air leakage," explains Joe commenting on the construction techniques that contribute to the homes containing a more effective R-Value.

Steel also offers numerous advantages relating to the interior finishes. "There are no issues with nail pops and corner beads that crack, therefore the house won't need to be constantly repainted," says Joe. There is no warping, splitting, creaking, cracking or rotting and the house is termite-proof, vermin-proof, ant-proof and it is fire resistant.

EnviroHomes feature leading design elements which include energy efficient products and materials.

"I believe in steel framing and have built many large custom homes with steel. In addition to the Eastbourne Estates project, I am currently building four other large homes with steel," says Joe Vella who has served on the R-2000 Builders Advisory Committee and Technical Committee in the past.

Design and Construction Team

DEVELOPER & BUILDER:
Fifthshire Homes 905-660-7415

ARCHITECT:
Watchorn Architects Inc. 416-385-1996

CONSULTING ENGINEER:
Adkins & Van Groll 416-489-7888

LIGHT STEEL FRAMING SUPPLIER:
Bailey Metal Products 1-800-668-2154

QIKIQTANI GENERAL HOSPITAL, IQALUIT, NUNAVUT

A View to Healing

Light steel framing is a proven technology which reflects the superior strength and consistency of steel. Steel, being inorganic, does not support the growth of mould nor does it give off gas, thus contributing to excellent indoor air quality.

Building a hospital in Canada's north presents numerous challenges, both physical and cultural. Such was the case with Qikiqtani General Hospital in Iqaluit in the Baffin Region of Nunavut.

The project was divided into three segments to accommodate tight shipping and construction windows and was completed in 2007. The roughly $45-million new acute care facility connects by link corridor to the old Baffin Regional Hospital building in a total project costing $64-million and is a joint venture between the Government of Nunavut and the project developer, Qikiqtaaluk Corporation.

"Steel studs ensure a superior final product due to the complex wall and ceiling details. Also, you eliminate the amount of deficiencies by using steel studs, especially when installing curved and complex walls."

John Kovacevic, Tampa Interior Systems

The Inuit culture believes the outdoors plays a significant role in its holistic healing methods. Reflecting this in turn played a role in the design objectives.

The exterior of the 5,450m² (58,663 sq. ft.) 2-storey building (with 3rd floor mechanical penthouse) has a façade suggesting the ambience of the north with undulating shapes of cedar cladding – the 'Precambrian Shield' – jutting through 'glacial overburden' of vertical white corrugated cladding, supported on wind bearing light steel framing. As Nunavut Minister of Health and Social Services Leona Aglukkaq explained, "(The facility) is family-focused and sensitive to Inuit values. Our goal is much broader than simply providing infrastructure."

In terms of physical construction the building's stacking plans provide a second floor plate larger than the main floor allowing the building to be cast into the steep terrain site and to provide the second floor at grade level in the back while providing a low profile to the overall massing of the building.

The primary framing is structural steel, with a 38mm (1.5") galvanized steel roof deck, with the main and 2nd floor systems comprising concrete on 76mm x 0.91mm (3" x .036") galvanized steel composite deck. The low-pitch standing seam roof is ArcelorMittal Dofasco's AZ180 Galvalume Plus, supplied through Agway Metals, rolled on-site with a total 3,360m² (36,166 sq. ft.) of which 560m² (6,028 sq. ft.) is curved over the penthouse. Light steel framing (LSF) studs provide the exterior wind-bearing framing as well as throughout the building for interior partitioning. The majority of the wall cladding 2,100m² (22,604 sq. ft.) is ArcelorMittal Dofasco's

The steel roof deck is MPA230 (Grade 33) 38mm (1.5") Z275 (G90) galvanized in Canam's (P3615) profile, on 500mm to 650mm (19.68" to 25.59") open web steel joists.

Steel's flexibility in detailing to and adapting to architectural requirements makes it an obvious choice. LSF systems allow ease of construction and adaptability to sometimes unforeseen site conditions. Steel cladding and roofing also allows simplicity in its detailing and installations while providing simple elegant clean facades.

Together with the Galvalume Plus steel roof, the materials are evocative, inexpensive, and environmentally responsible. Steel is primarily recycled, post consumer products and, being light in color do not create heat islands.

STEEL STRUCTURAL SYSTEM

Building Framing:
Structural steel as its primary construction material.

Roof Structure:
38mm (1.5") Z275 (G90) galvanized steel deck (P3615) on 500mm to 650mm (19.68"x 25.59") open web steel joists spanning to steel girders ranging from W410 x 46 up to W530 x 82.

Second Floor System:
(2-hour Fire resistance Rating ULC F905 114mm (4.49") concrete on 76mm x 0.91mm (2.99" x .0358") Z275 (G90) galvanized HB composite steel deck (P2432) supported on wide flange beam and girder systems, ranging from smaller W310 x 39 elements through to larger W530 x 92 components in heavier loaded areas.

Main Floor System:
114mm (4.49") concrete on 76mm x 0.91mm (2.99 x .0358") Z275 (G90) galvanized HB composite steel deck (P2432) supported by wide flange beam and girder systems ranging from smaller W310 x 39 elements through to larger W530 x 92 components in heavier loaded areas. Loads are transferred to HSS columns with nominal dimensions of 203 x 203 x 13mm (7.99 x 7.99 x .51").

Foundation:
Columns are founded on clusters on 141 x 6.4mm (5.55 x .25") O.D. HSS steel pipe piles. Pile caps are designed and configured to accept centroid of load using nominal W 460 x 158 wide flange beams. Steel pipe piles are 'rock-socketed' and grouted into bedrock.

Lateral System:
The lateral system for the structure consists of HSS chevron bracing. The connections of the bracing members were detailed as per S16-01 to insure proper ductility.

Interior Light Steel Framing:
Approximately 2,667m (8,750 ft.) of non load bearing wall, with 92mm and 152.4mm (3-5/8 and 6') stud. MPA33 (Grade33).

Fire Rating for Walls:
0Hr, 1Hr, and 2Hr rated assemblies.

Acoustic Rating for Walls:
Typically maintaining an STC of 48 or 56.

Wall Height:
Majority 355mm (14') in height.

ENVELOPE:

Steel Wall Cladding:
2100m² (22,604 sq. ft.) of .61mm (.0239") thickness, 12.7mm (1/2") profile corrugated, prepainted Z275 (G90) galvanized, coloured QC8317 White/White.

Steel Roof Cladding:
The roof is .61mm (.0239") Galvalume Plus™, rolled on site, with a 38.1mm (1-1/2") standing seam double fold, and a 406.4mm (16") pan with stiffening ribs on stainless steel clips at 609.4mm (24") O.C. The flat roof area measures 2,800m² (30,139 sq. ft.), the curved roof is 560m² (6,028 sq. ft.).

Exterior Wind Bearing Walls – Light Steel Framing:
MPA340 (Grade 50) 1.22mm (.048") G90 galvanized.

The angled wings of the new hospital in conjunction with sloped roofs, give rise to a relatively streamlined form responding well to the site and often-extreme weather conditions.

The naturally lit 10m (32.8 ft.) high atrium is decorated with works of art.

prepainted Z275 (G90) galvanized, coloured QC8317 White/White, supplied by Vicwest.

Terry Gray, Project Manager for FSC Architects and Engineers, finds that pre-painted steel, as a finishing material on an exterior envelope, mixed with complementary materials and or simplified well thought out architectural detailing, provides designers and building owners control of soaring construction costs while getting optimum building performance and impressive looking buildings.

ArcelorMittal Dofasco's unpainted AZM180 Galvalume Plus™ for the roof, as supplied through Agway Metals, has excellent solar reflectance. Time has proven and research has confirmed that Galvalume Plus steel roofs last longer, without any significant maintenance and thus provide exceptional value.

Design and Construction Team

OWNER AND DEVELOPER:
Qikiqtaaluk Corporation

CLIENT: Community and Government Services, Government of Nunavut, Department of Health

PRIME CONSULTANT:
FSC Architects & Engineers 867-979-0555

ARCHITECTURE: FSC Architects and Engineers in association with William Nycum and Associates (Healthcare Design Architects): 902-454-8617

STRUCTURAL ENGINEERING:
Adjeleian Allen Rubeli Consulting Engineers 613-232-5786

MECHANICAL ENGINEERING:
FSC Architects & Engineers 780-439-0090 and F.C. O'Neill Scriven and Associates 902-429-0090

GENERAL CONTRACTOR:
SNC-Lavalin Engineers & Constructors Inc. 867-979-7958

ELECTRICAL ENGINEERING:
Donald T. Matheson Engineering Ltd. 902-429-1832

CIVIL/MUNICIPAL ENGINEERING:
FSC Architects and Engineers 867-920-2882

COST CONSULTANTS: Hanscomb, Inc. 613-234-8089

CODE AND LIFE SAFETY CONSULTANTS:
Gage Babcock and Associates 604-732-3751

MICROCLIMATE SPECIALISTS:
Rowan William Davies & Irwin 519-823-1311

MECHANICAL CONTRACTOR:
Schendel Mechanical 780-447-3400

ELECTRICAL CONTRACTOR: KRT Electrical 867- 979-2639

CIVIL WORKS CONTRACTOR:
Kudlik Construction 867-979-1166

PILING CONTRACTOR: Canadrill 867-979-6031

WALL CLADDING SUPPLIER: Vicwest 1-800-387-7135

ROOFING STEEL SUPPLIER:
Agway Metals 1-800-268-2083

CLADDING ENVELOPE INSTALLER:
Arcan Construction 867-874-2303

STEEL DECK SUPPLIER: Canam Steel 1-888-849-5910

STEEL DECK INSTALLER: Sturo Métal Inc. 418-833-2197

INTERIOR PARTITIONS:
Tampa Interior Systems Inc. 905-804-1372

PHOTOGRAPHY: Roger Belanger

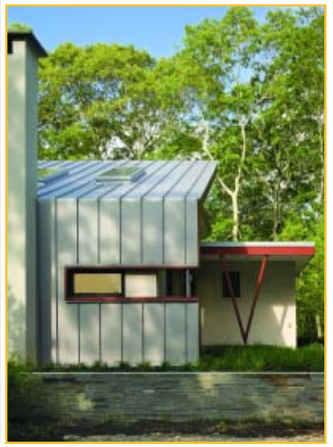
WHALE ROCK HOUSE, EAST HAMPTON, NEW YORK

Prepainted Galvalume selected for *Functional* and *Environmental* reasons

Eisner Design, with a commitment to sustainable and environmental design, selected prepainted steel for the exterior of the Whale Rock House due to its recyclability, durablility and low maintenance. However, perhaps the most interesting concept of the project is articulated by how the architect has incorporated the standing seam steel roof.

The long life, cool prepainted Galvalume steel roof wraps and protects the stucco volumes on its three sides in similar fashion to how one's hand might hold or cup an egg. The standing seam steel roof bends to become the vertical plane of the exterior wall. The decking of sustainable mahogany acts as the underside of the enveloping hand, aligning with the standing seam roof line above. The roof/wall wrap also extends past the kitchen to define an outdoor covered dining deck.

According to Joe Eisner, "the primary design intent was to have a continuous exterior steel wall wrap to envelop and protect the inner stucco volumes". Aesthetically, the vertical standing seam helps articulate the continuity from roof to exterior wall plane by their continuous lines.



The prepainted silver coloured Galvalume roof remains cool, minimizing solar heat gain and, according to Joe, "...the steel roof was selected for functional, environmental and aesthetic reasons. As well, the standing seam installs quickly and provides an energy efficient, durable, long life roof".

For the roof and wall cladding .61mm (.0239") prepainted Galvalume, coloured Silver, with the Kynar 500 fluoropolymer finish was used.

Design and Construction Team

ARCHITECT: Eisner Design LLC – New York 212-418-84008

GENERAL CONTRACTOR: Aran Construction 516-885-9958

ROOF & WALL CLADDING INSTALLER: Copper Works 631-235-5801

PHOTOGRAPHY: Paul Warchol Photography Inc.

Hospital Employees' Credit Union Headquarters, Burnaby, BC

The 4,645m² (50,000 sq. ft.) two-storey building provides offices, conference rooms and staff facilities for the Union. The curved steel roof is exposed inside, creating an expansive barrel-vaulted open work environment at the second floor. Three sky lit atria in the centre bring natural light to the interior and down to ground level. Deep overhangs provide sun control to the exterior windows.

Architects: MCMP Architects, Vancouver. ■

Freedom Elementary School, Louisville, Ky

One of the many advantages of the steel building system approach is speed of construction. With an ambitious construction schedule and very specific project requirements, a steel building system and components were utilized in the design of the Freedom Elementary School. From start to finish, the timetable for the school's completion was just 14 months.

The standing seam roof and ribbed wall panels are manufactured from 61mm (.0239") galvanized steel and have a PVDF paint finish.

The 6,688m² (72,000 sq. ft.) school measures 121m x 130m (400' x 425') and has eaves of 4.26m and 8.53m (14' and 28'), depending on location. The 3:12 roof pitch is consistent throughout. The school's Great Hall has an octagonal roof with clerestory windows. The school needed unobstructed attic spaces for the mechanical platforms to support geothermal heat pumps. Creating the necessary spaces and accommodating the extra dead loads presented no problems. The standing seam roof and ribbed wall panels are manufactured from .0239" galvanized steel and have a PVDF paint finish.

Architects: Sherman Carter Barnhart, Louisville, Ky ■

Light Steel Framing Steel – and the Environment

Sustainability was defined nearly thirty years ago as 'progress that serves the needs of the present without compromising the ability of future generations to meet their own needs'[1] Today, population growth, finite resources and recognition of climate pattern anomalies possibly resultant from resource depletion and fossil fuel combustion gases are motivating architects, builders, designers and owners to demand products that use resources wisely. This social consciousness and the financial reality of increasing energy costs has dramatically shortened payback periods for investment in sustainable alternatives, so that, put simply, it pays to be green. ■

[1] *Excerpted from the report of the Brundtland Commission to the United Nations, "Our Common Future" 1988*

Materials, like steel, which satisfy multiple value equations simultaneously are obvious choices for the building owner.

Dimensional Stability + Fire, Insect and Mould Resistance + Ductility = Durability

Sustainability also includes building maintenance and the associated labour, material and energy inputs. Quality construction practices and material selection assure that maintenance intervals fall farther apart which promotes durability. Materials like steel that satisfy multiple value equations simultaneously are obvious choices for the building owner.

For example, the dimensional stability of steel studs eliminates interior and exterior surface irregularities caused by seasonal movement of cellulose materials (like drywall, wood sheathing and some claddings). In exterior load-bearing walls where postponing maintenance can result in water and air intrusion, steel won't rot or provide a nutrition source for termites, bacteria, or mould. The fire resistance of steel provides an additional level of safety to structural frames in high density communities and arid climates prone to wildfires. The ductility of CFS, or the material's tendency to bend, not break, satisfies criteria for seismic and high wind designs.

Steel Framing Alliance © SFA, 2008 ■

Galvalume SSR Selected for Functionality and Cost Efficiency

As Nick Mahata states, "the objective for the Yankee Valley Crossing Shopping Centre in East Airdrie, Alberta, was to do something that was aesthetically pleasing and low maintenance over the life of the building". The 2,044m² (22,000 sq. ft.) of .61mm (.0239") unpainted AZM180 Galvalume™ Plus standing seam roof, consisted of a lot of hips, ridges and valleys. "The unpainted Galvalume Plus fit with the post modern design of the project. Additional benefits are that it is functional and cost efficient without the headaches that normally go with other types of roofs".

Galvalume Plus standing seam roofing is environmentally friendly, cost efficient and it provides a durable and long lasting roof.

Nick Mahata Architect Inc. ■

Windsor International Transit Terminal

The new Transit Terminal located on the west side of Windsor's downtown area consists of a building housing a public concourse, administrative offices and a ticket selling area. The concourse is approximately 9m (30 ft.) high with an attractive exposed structural steel element including steel roof deck. The exterior of the roof is curved .61mm (.0239") prepainted Galvalume steel with a fluorocarbon PVF2 (10,000 Series) finish, Slate Blue. "This building was designed for a life expectancy of 75 years and the materials and systems were chosen to suit this requirement. Steel roofing and cladding permitted us to meet that criteria, while at the same time, develop an attractive structure in this developing area of Windsor's downtown". ■

Owner:	City of Windsor
Architect:	Jerry Glos, Glos Associates Inc. 519-966-6750
Mechanical Engineer:	Field Craft Engineering 519-726-6400
Structural Steel:	A.C. Metal fabricating 519-737-6007
Steel Roofing:	Gillett Sheet Metal 519-326-6301

This building was designed for a life expectancy of 75 years.

Aesthetically pleasing, light weight and low maintenance are just a few of the benefits of prepainted Galvalume roofing.

Doug Kingsmore Stadium Clemson University Clemson, SC

Recently, $4 million in renovations were completed at Doug Kingsmore Stadium at Clemson University. Along with new brick facades at the entrances, the project involved extending the roof over the main grandstand to create additional covered seating.

To top the newly configured roof, Michael Keeshen & Associates of Greenville, SC, elected to use a standing seam roof. The standing seam roof panels for the project measure 406mm (16") wide. They were formed from .61mm (.0239") Galvalume-coated steel and have an Evergreen PVDF paint finish. Piper Roofing of Greenville installed the material.

The picnic pavilion and ticket booths were also covered with the same panels.

Credit: Metal Architecture ■

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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