



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. Please send a description of the project, including photographs, to:

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CHANGE OF ADDRESS, NEW SUBSCRIPTIONS

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COVER PHOTO: Grand Quai – Port of Montreal, Montréal, Québec
PHOTOGRAPHER: David Boyer



transforming
tomorrow



thus providing a very favourable impression to arriving cruise passengers. The pier is now named Grand Quai du Port de Montréal.

6 Fox Lake Cree Nation School, Gillam, Manitoba

The building massing utilizes stepped, sloping roofs which avoid valleys and the possibility of water or snow coming down on entry points. The high gymnasium volumes act as a backdrop to the rest of the building and the curved roof edges soften the school's rooflines and add a dynamic sense of movement.



9 Wolfville, Nova Scotia Library

In 2017 it was determined that the original shingles on the railroad station, now the Wolfville Library, had reached the end of their service life. FMB Architecture | Design, the architect chosen for the re-roofing, elected to use a diamond shape roof tile made from ArcelorMittal Dofasco's pre-painted AZM150 Galvalume® steel in the Granite® Deep Mat paint system.



10 Menlo-Atherton Performing Arts Center, Atherton, California

With a mission to bring music and drama to the surrounding community, this performing arts building, located on the campus of an arts-oriented high school, features broad, overhanging eaves designed to complement existing low-slung classroom buildings. A simple standing seam roof, draped over an assemblage of functional elements provides a single reading of these complex functions while diminishing the mass of a 21.3m (70 ft.) tall fly tower.

14 Certification of Canadian Manufacturers of Lightweight Steel Framing (LSF)

As of January 1, 2019, certification is a requirement for membership as a CSSBI Light Steel Framing (LSF) Manufacturer Member. It is also a requirement for a company to use the LSF load tables currently being developed. The CSSBI believes that this initiative will be an advantage for the Canadian construction industry.



18 Green Storage, Hamilton, Ontario

Significant challenges were experienced in turning a structure that was built 100 years ago into a state of the art energy efficient building that will be NET ZERO on electricity and heating/cooling.

IN | THIS | ISSUE

3 Grand Quai du Port de Montréal, Québec
Provencher Roy restored the old Alexandra Pier and transformed it into an exceptional river walk, which was integrated into the existing pedestrian network built up over the past few decades along the side of the Saint Lawrence River. The Iberville Passenger Terminal, built in 1967 on the pier, was also completely renovated with modern facilities,



16 Design Versatility, Ease of Installation and Resilience

Steel is used in everything from industrial to iconic structures and is particularly suited to mid-rise construction, where turnkey framing solutions for virtually any type of residential or commercial building project are available.



Pre-painted Galvanized Steel Insulated Steel Panels complement revitalized Terminal 1

Ideally located on the St. Lawrence River, Montreal's Old Port is renowned for its walking and cycling network, along with free public spaces with spectacular views of the river and of the city skyline. This project, completed in 2018, the Port of Montreal's Grand Quai, adds to this network and showcases an insulated steel panel exterior envelope solution on the buildings.



At the entrance to the Grand Quai is the Port Centre, with a conference room and a permanent History of Ships exhibition.

In 1967 the Iberville Passenger Terminal, or Terminal 1, was constructed on a 305m x 91m (1,000 ft. x 298.5 ft.) pier for receiving cruise ship passengers. Parallel to it was a parking structure, or Terminal 2. They extend nearly the entire length of the pier.

A project to renovate the entire cruise ship terminal was launched in 2014. The parking structure, which covers 7,500m² (80,730 sq. ft.), was renovated. The contractor first removed the second story of Terminal 1, then demolished



a building at the entrance to the pier and sloped the far end of the pier so that both pedestrians and cyclists could easily descend to the water's edge.

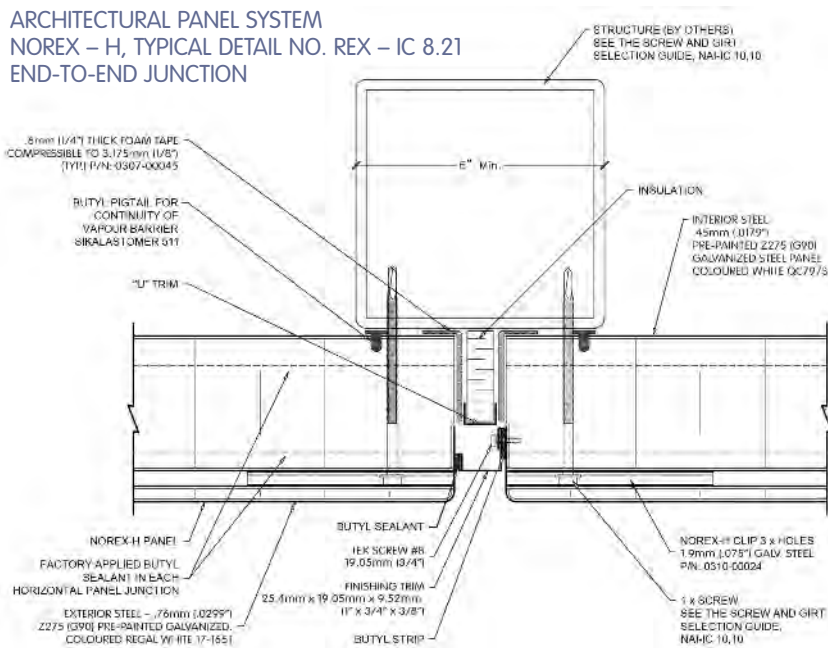
A Port Centre was built on the site of the demolished building and is connected to Terminal 1. Terminal 1 was rebuilt on one level and a Pavilion was built onto the far end of the structure. Provencher_Roy specified Norex-H, 76.2mm (3") thick, insulated steel panels, manufactured and supplied by Norbec, for the exterior of the 8,150m² (86,708 sq. ft.), Terminal 1, Port Centre and Pavilion.

Each panel measures 760mm by 4,825mm (30 in. x 15.8 ft.). The exterior is pre-painted .76mm (.0299") Z275 (G90)

galvanized steel, with a fluoropolymer paint system, coloured Regal White 17-1651. The interior surface is .45mm (.0179") Z275 (G90) galvanized steel, pre-painted with Interior White QC7973. A total of 2,350m² (25,295 sq. ft.) of Norex-H was used.

"The building is very long. This kind of product works well to cover long surfaces without windows and doors. It has a geometry that works well in the context of a maritime station," says Sonia Gagné, Partner and architect with Provencher_Roy. "It is economical, rapid to install and the panels marry well with a simple building volume. The horizontal modules emphasize the linearity of the building."

ARCHITECTURAL PANEL SYSTEM NOREX – H, TYPICAL DETAIL NO. REX – IC 8.21 END-TO-END JUNCTION



PRODUCT USED:

Norbec's Norex-H, pre-painted Z275 (G90) galvanized steel panels. Panel thickness: 76.2mm (3")

INTERIOR STEEL	EXTERIOR STEEL:
• .45mm (.0179")	• .76mm (.0299")
• Colour: White QC7973	• Colour: 17-1651 Regal White
• Profile: Silkline (striated)	• Profile: Silkline (striated)
• Finish: Smooth	• Finish: Smooth

DESIGN AND CONSTRUCTION TEAM

BUILDING OWNER: Port de Montréal

ARCHITECT: Provencher_Roy 514-844-3938

INTERIOR DESIGN: Provencher_Roy | Design intérieur 514-844-3938

CONTRACTOR: Pomerleau 514-789-2728

STEEL WALL PANEL SUPPLIER: Norbec Inc. 877-667-2321

STEEL WALL PANEL INSTALLERS: Le Groupe EFC. 418-878-5660
and RHR Revêtement 450-359-4192

STRUCTURAL STEEL SUPPLIER: Groupe C. & G. Beaulieu Inc. 450-653-9581

ELECTROMECHANICAL: Pageau Morel et associés 514-382-5150

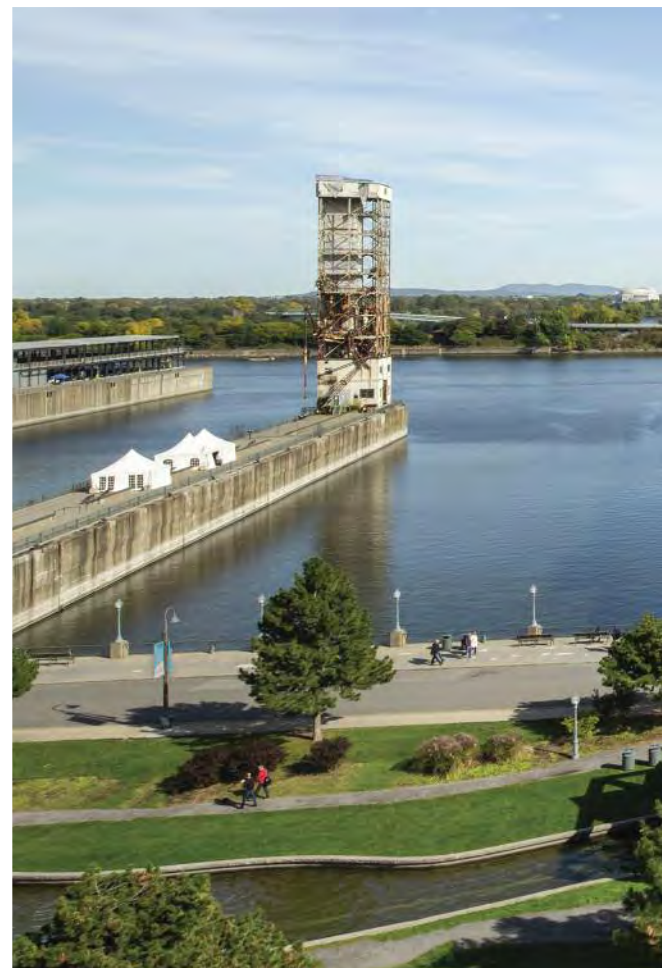
LANDSCAPING: NIP Paysage 514-272-6626

STRUCTURAL ENGINEERING: NCK Inc. 514-878-3021

MARITIME INFRASTRUCTURE: WSP Group 514-340-0046

CIVIL ENGINEERING: WSP Group 514-340-0046

PHOTOGRAPHER: David Boyer 450-822-9545





Norex, is a polyurethane core panel which offers unparalleled thermal value. It provides fire and rain protection barriers as well as ensuring resistance against wind and tears because of its exclusive anchoring system, when installed. The design of this product is cavity free and has a thermal barrier, reducing the risk of condensation penetration and in return moisture.

Norex H insulated steel panels being installed on the light steel framing of Terminal 1 and on the Pavilion of Grand Quai.

Redesigned and renovated, the Port of Montréal's Grand Quai receives cruise ships and welcomes local pedestrians and cyclists to a waterside park in this beautiful, historic area.



Pre-painted Galvanized Steel – perfect for Wall and Roof Cladding

Number Ten Architectural Group has a long history of working in remote areas of northern Canada. In particular, the Winnipeg-based firm's academic buildings have enriched the educational and recreational quality of life for indigenous communities. Pre-painted Z275 (G90) galvanized steel was chosen for the wall and roof cladding for its durable and non-combustible properties.

The Fox Lake Cree Nation School is located in the town of Gillam, a semi-rural community in Northern Manitoba. The 1,349m² (14,520 sq. ft.) elementary school accommodates a student population of 65 (town population 1,300), as well as a high school re-entry program and adult education. The school's modest scale and low-slung roofs create an intimate setting for students, staff and visitors alike.

The mandate called for a flexible design that would allow for community use of the facility during both school and non-school hours for continuing education programs, recreation and social events. The building's compact plan utilizes a "corridor loop"

around a central core and two sets of lockable, interconnecting doors. Designed as a 'house within a house', the central core comprises washrooms, Principal's office and Administration spaces. Clear sightlines across gathering spaces and through interior windows promotes interaction between students and staff, while fostering a sense of security. The centrally-designed layout and flexible programming allows visitors access to the Library, Computer Room and Gymnasium, while leaving the classrooms undisturbed.

While the interior features warm colours and natural materials, the exterior also features a simple palette.





The high gymnasium volumes act as a backdrop to the rest of the building and the curved roof edges soften the school's rooflines and add a dynamic sense of movement.

Pre-painted steel was selected for the wall cladding and roof for its durable and non-combustible properties, particularly in an area where forest fires are a concern.

Additional benefits include its lightness, range of colour options and ease of transport and installation – especially valuable given the location 1,000km (621 miles) north of Winnipeg and 200km (124 miles) south of Churchill.

Gillam's subarctic climate, with average January lows of -30°C, presented unique challenges, which the architects mitigated through the building's orientation and massing. Windows are located to maximize natural light: diffuse,

northern light in classrooms and warm, direct sunlight in the kindergarten spaces. Entrances are shielded from harsh winds. The tall Gymnasium provides protection to the playground from the winter wind. To improve the building systems' serviceability, the mechanical equipment is installed on a mezzanine – a controlled environment rather than the traditionally used roof or grade-level pad configurations. This improves site safety conditions, simplifies routine maintenance procedures (reducing the significant costs of transporting parts and technicians), and allows for a clean, clear roofline.

The standing seam steel roof system was specifically

The building massing utilizes stepped, sloping roofs that avoid valleys and the possibility of water or snow coming down on entry points. Pre-painted steel was selected for the wall cladding as well as the roof for its durable and non-combustible properties.



designed to avoid roof valleys that are susceptible to ice damming and roof leaks. Pre-finished downspouts and steel gutters are utilized at roof edges at entrances and in high traffic areas. The architects designed a 'soft' curved edge profile – mimicking a feather – in contrast to the metal siding.

The architects engaged the community in a competition to

design the stained-glass feature window at the school entry. Like in the building itself, its colours – white, yellow, red and black – were derived from the Nation's four sacred colours and directions. "The Fox Lake school is one of my favourite projects of my career," says Project Architect Greg Hasiuk. He and Number Ten have continued to design and build schools across Saskatchewan and Alberta, further refining model schools that don't feel overly formal and institutional. "Our mission is to get rid of cells and bells."

It was important that the design be flexible in order to allow for community use. The community specifically identified the gymnasium, change rooms, computer room and library as areas that would be extensively utilized by the community both during and after school hours.

DESIGN AND CONSTRUCTION TEAM

OWNER: Fox Lake Cree Nation

PROJECT MANAGER:

P.M. Associates 204-949-5150

ARCHITECT: Number Ten Architectural Group 204-942-0981

STRUCTURAL CONSULTANT:

Crosier Kilgour & Partners Ltd. 204-943-7501

MECHANICAL & ELECTRICAL CONSULTANT:

Cochrane Engineering Inc. 204-477-6650

LANDSCAPE CONSULTANT:

Hilderman Thomas Frank Cram 204-944-9907

GEOTECHNICAL, SURVEY & ENVIRONMENTAL CONSULTANT:

Cochrane Engineering 204-477-6650

CONSTRUCTION MANAGER:

Fox Lake Cree Nation 204-953-2760

GENERAL CONTRACTOR:

T.L. Penner Construction 204-486-556-1400

ROOF & WALL CLADDING MANUFACTURER:

Vicwest 1-800-661-6936

ROOF & WALL CLADDING INSTALLER:

Oakwood Roofing & Sheet Metal Co. 204-0237-836

All material is pre-painted galvanized steel conforming to ASTM A653 Grade A and coating to ASTM A924.

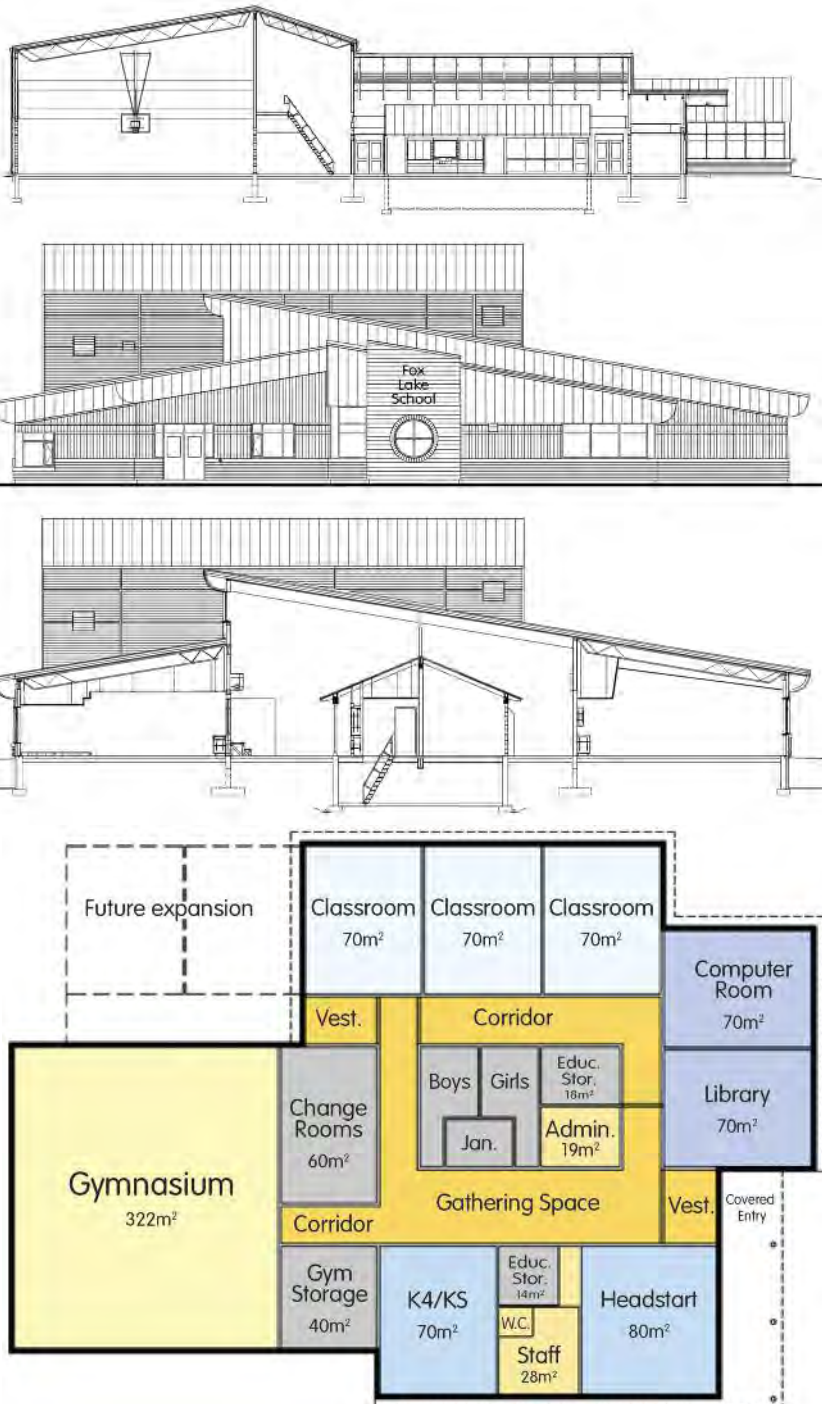
ROOF CLADDING: Pre-painted .76mm (.0299") Z275 (G90) stand seam, 38mm (1-1/2") rib. Colour: Cambridge White 56161.

WALL CLADDING: Pre-painted .76mm (.0299") Z275 (G90) 22.2mm (7/8") corrugated. Colours: Slate Blue 56067; Red 56064 & Cambridge White 56161 Fascia.

FASCIA, SOFFITT & TRIM: Pre-painted .76mm (.0299") Z275 (G90) galvanized steel. Colours: Cambridge White 56161 & Tan 56074.

ROOF DECK: Vicwest RD938 – 76mm (.0299") ZF75 Galvaneal (standard and acoustic).

FLOOR DECK: Vicwest HB938 – 76mm (.0299") ZF75 Galvaneal. ZF75 conforms to ASTM A653.



AZM150 Galvalume® Steel Provides Added Protection to this Heritage Trust Structure

Wolfville's Railroad Station is one of Nova Scotia's few remaining brick railway stations. The Station was abandoned in 1990 when Dominion Atlantic Railway ceased passenger service in the Annapolis Valley. However, after months of community fundraising efforts, private donations, and support from the Province and the Town of Wolfville, the station was purchased by the Wolfville Library Foundation.

The station, a two-and-a-half storey brick and stone building, is valued for its historical association to the railway system in the Annapolis Valley and for its renovation in 1993 by Wolfville's citizens. In 1994, the Foundation received the Heritage Trust of Nova Scotia Built Heritage Award for the Station's restoration. The current Wolfville Memorial Library, is one of eleven branches of the Annapolis Valley Regional Library System. In 2017 it was determined that the original shingles on the railroad station, now the Wolfville Library, had reached the end of their service life.

Harvey Freeman, of FMB Architecture I Design, the project architect for the re-roofing, elected to use a diamond shaped roof tile made from ArcelorMittal Dofasco's .38mm (.0149") pre-painted AZM150 Galvalume steel in the Granite Deep Mat paint system, coloured QC60035 Graphite Gray. Granite Deep Mat is a pre-painted Galvalume coated steel that combines excellent formability and corrosion resistance and brings differentiation and originality in roofing and cladding designs for residential and commercial building projects.

According to a community consultation done by the Annapolis Valley Regional Library (AVRL) in late 2017, most agree that a larger library is needed in Wolfville. "The planning is in the early stages," says Ann-Marie Mathieu, chief executive officer of AVRL. "We are looking at all possibilities and how a new library fits in with the aspirations of the Town of Wolfville."

According to the survey results, most people want the library to stay in the current building, but the community has two needs: a traditional library as well as a social gathering space. The current Library space is 269m² (2,900 sq. ft.). The Annapolis Valley Regional Library – Wolfville Library Needs Assessment, 2017, estimated that the design population for the

Wolfville Library to be 13,000, with the total space requirement being 1,382m² (14,880 sq. ft.). A working group of staff and volunteers, with relevant experience, has been composed and is looking at how the library fits with the ongoing review of the town's planning documents.



Original diamond shaped asbestos shingles on the old roof.



South and Northwest elevations of the re-roofed historic Wolfville Railway Station, now the Wolfville Library, showing the diamond shaped pattern roofing tile made from ArcelorMittal Dofasco's pre-painted .45mm (.0179") AZM150 Galvalume using the Granite Deep Mat paint system coloured QC60036 Graphite Gray, with snow guards.

DESIGN AND CONSTRUCTION TEAM

OWNER: Town of Wolfville, N.S. 902-542-3960

ARCHITECT: FMB Architecture I Design 902-429-4100

STEEL ROOF CLADDING SUPPLIER:

Diamond Steel Roofing Systems 1-888-810-7663

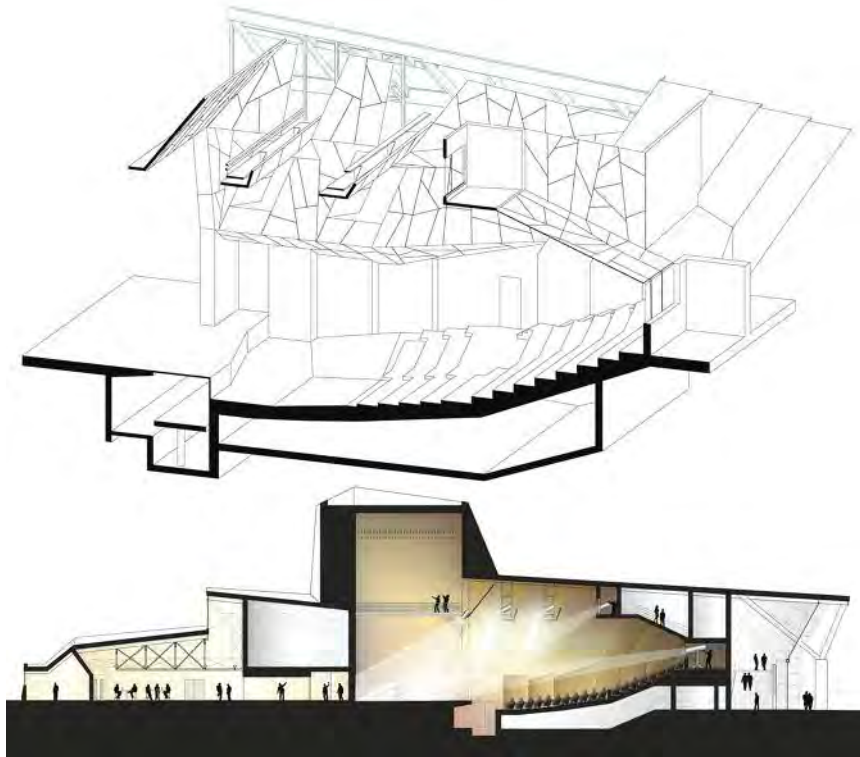
STEEL ROOFING INSTALLER:

Mid Valley (1997) Ltd. 902-765-6312

STEEL ROOF CLADDING MANUFACTURER:

Diamond Steel Roofing Systems 1-888-810-7663

Innovative design utilizing pre-painted Galvalume Cladding and Hollow Structural Steel framing



This centre is a state-of-the-art, multi-discipline performing arts space designed for community and professional use. Since its opening it has housed dance, theatre and musical performances of all types and skill levels.

It is on the campus of Menlo-Atherton High School, surrounded by the semi-rustic environment of Menlo Park. The project's highly conceptual design was inspired by the surrounding heritage valley and coastal oak groves on campus.

The interior of the centre is dominated by a five-hundred seat auditorium which can be optimized acoustically for either dramatic performances or musical events. It includes a 19.8m (65-foot) high loft, fly gallery, stage house, orchestral lift, practice and academic meeting spaces, a "green" room and a cafeteria/warming kitchen.

With the objective to bring music and drama to its students and the surrounding community, this 2,880m² (31,000 sq. ft.)

"At the heart of Hodgetts + Fung's vivid, tactile architecture is an ability to heighten the way people see and experience space."

Alan Hess



Steel struts surmounting massive concrete columns complement the oaks facing the lobby and support the exposed structure of the roof above the depressed entry courtyard sheltered by a branching structure designed to inspire spontaneous outdoor performances.



performing arts building is located on the campus of Menlo-Atherton High School, an arts-oriented high school. It features broad, over-hanging eaves – designed to complement existing low-slung classroom buildings and monumental structural trees – which echo the entry grove of historic oaks. The building is configured to serve both a formal, regional audience and a more casual group of parents and students. A direct response to the community's revered heritage oak trees established the axial alignment and served as the governing metaphor for the building's structural, volumetric and aesthetic development.

Single, folded roof plane encloses this theater complex for Menlo-Atherton High School.



A simple standing seam roof draped over an assemblage of functional elements provides a single reading of these complex functions while diminishing the mass of the 19.8m (65 ft.) tall fly tower.

Variations in the relationship of the folded planes of the roof to the surrounding landscape provide opportunities for student meeting places and mechanical equipment. To the south, steel struts surmounting massive concrete columns complement the oaks facing the lobby, and support the exposed structure of the roof above the depressed entry courtyard sheltered by a branching structure designed to inspire spontaneous outdoor performances.



Photograph showing hollow structural steel (HSS) used for the light support framing in lobby area.

PROJECT SIZE: 2,900m² (31,209 sq. ft.)

ROOF DECK:

- .91mm (.036") G60 Galvanized ASTM A635 Grade 33.

ROOF CLADDING:

- .61mm (.0239") AZ50 Galvalume (AZM150 in Canada) 22.2mm rib x 457mm (7/8" rib x 18") wide flat panel, standing seam roof, coloured Champagne in the Kynar paint system.

HSS SECTIONS AT PATIO:

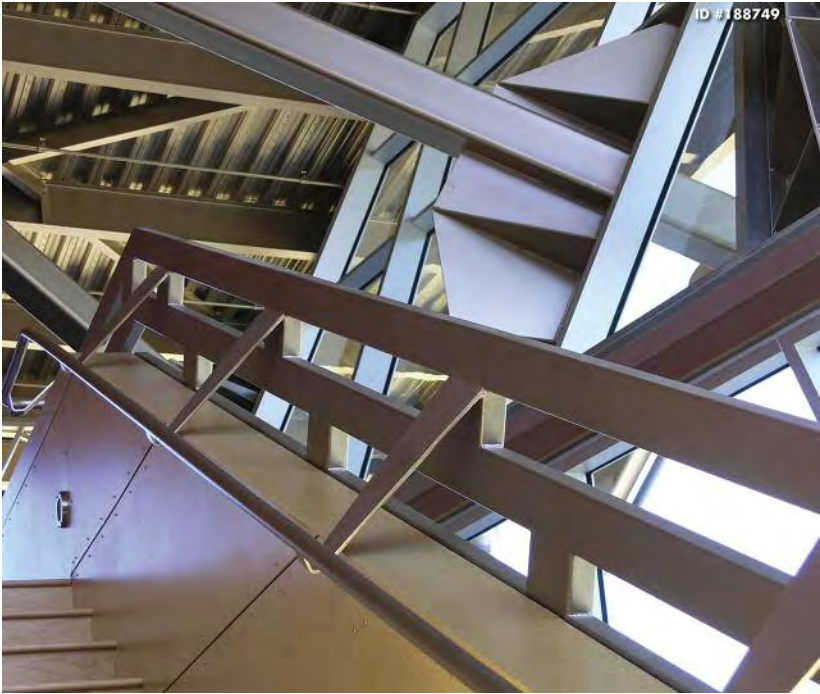
- HSS Diagonal Braces: HSS 304.8mm x 304.8mm x 15.87mm (12" x 12" x 5/8") A500 Grade B (Diagonal bracing at patio).
- HSS Pedestal Base: HSS 457mm x 12.7mm (18" x 1/2") A500 Grade B.

HSS SECTIONS – LOBBY:

- HSS Light Support Framing – Roof framing above: 355.6mm x 558.8mm (14" x 22") beams Grade A992.
- HSS hangers from WF beams above: HSS 152.4mm x 101.6mm x 12.7mm (6" x 4" x 1/2") A500 Grade B.
- HSS horizontal members: HSS 152.4mm x 101.6mm x 6.35mm (6" x 4" x 1/4") A500 Grade B.
- HSS skewed light support beams: HSS 152.4mm x 101.6mm x 6.35mm (6" x 4" x 1/4") A500 Grade B.
- Diagonal angle bracing: 50.8mm x 50.8mm x 7.94mm (2" x 2" x 5/16") A36.
- Roof Framing above: W12 and W16 beams Grade A992.

GUARDRAIL FRAME – ALONG MAIN STAIR ASCENDING TO 2nd FLOOR

- Top, intermediate & bottom rails: HSS 101.6mm x 50.8mm x 3.175mm (4" x 2" x 1/8") A500 grade B.
- Stub pieces between rails: HSS 152.4mm x 50.8mm (6" x 2").
- Steel Deck above brace assembly/roof framing: .91mm (.036"). G60 Galv.
- Grab rail: 38.1mm (1-1/2") standard pipe.
- Grab rail brackets: 38.1mm (1-1/2") thick shaped/bent plate A36.
- Pictured above: HSS 304.8mm x 304.8mm x 15.875mm (12" x 12" x 5/8").
- Roof support w/plate assembly (penetrating glass): A500 Grade B 609mm x 1,397mm (24" x 55") and assorted size WF roof beams Grade A992.



SUSTAINABILITY OBJECTIVES

An energy saving H-Vac system, which distinguishes between the rarely occupied auditorium and the heavily used support facilities – scenic shop, rehearsal room, and community space – is programmed to harvest cool or warm air and direct it to the occupied portions of the facility. Operable windows allow for heating and cooling, while occupancy sensors keep lighting needs regulated indoors and out.

An under floor plenum delivers conditioned air directly to seated theater patrons by means of registers under each seat. This technique avoids the waste associated with conventional systems by providing tempered air at the occupied zone.

Sustainable, yet visually rich materials such as exposed steel – have been carefully detailed with laser cut precision to form the public spaces in the lobby and theatre.

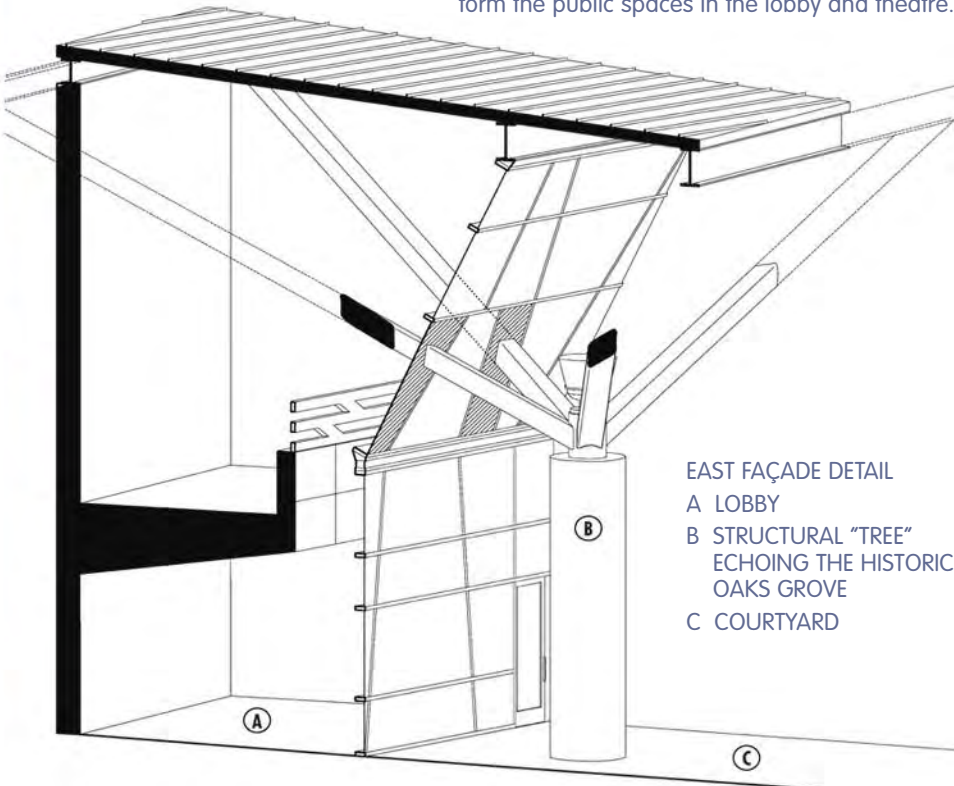
Main Stair ascending to 2nd floor. See sidebar on page 11.



Broad, overhanging eaves designed to complement the surrounding low-slung classroom buildings and monumental structural “trees” which echo the entry grove of historic oaks.



Exemplified by the structural “trees” sustainable, yet visually rich materials – such as exposed steel, have been carefully detailed with laser cut precision to form the public spaces in the lobby and theatre.



- EAST FAÇADE DETAIL
- A LOBBY
 - B STRUCTURAL “TREE” ECHOING THE HISTORIC OAKS GROVE
 - C COURTYARD

DESIGN AND CONSTRUCTION TEAM

CLIENT: Sequoia Union School Board

ARCHITECT:

Hodgetts + Fung Design and Architecture 323-937-2150

GENERAL CONTRACTOR:

Blach Construction Co. 408-244-7100

STRUCTURAL ENGINEER:

Englekirk Structural Engineers 323-733-6673 or 714-557-8551

MECHANICAL ENGINEER:

IBE Consulting Engineers Inc. 818-377-8220

CIVIL ENGINEER:

BKF Engineers Surveyors Planners 650-482-6300

ACOUSTICAL: Akustiks 203-299-1904

THEATRE: Fisher Dachs Associates 212-691-3020

LANDSCAPE: Tanaka Design Group 415-863-7800

FABRICATOR/ERECTOR:

Concord Iron Works, Inc. 925-432-0136

STEEL DECK SUPPLIER: Verco Decking Inc. 916-488-8180

STEEL DECK INSTALLER: B.T. Mancini Co. Inc. 408-942-7900

PHOTOGRAPHS:

Courtesy Hodgetts + Fung Design and Architecture



The interior of the centre is dominated by a five-hundred seat auditorium which can be optimized acoustically for either dramatic performances or musical events.



Certification of Canadian Manufacturers of Lightweight Steel Framing (LSF)

The CSSBI has developed a new standard CSSBI 61-18 *Manufacturer Certification Requirements for Cold Formed Steel Framing Members*. Under the CSSBI certification program, a participating Manufacturer certifies that the designated structural and non-structural cold formed steel (CFS) framing members it produces meet or exceed the applicable ASTM International (ASTM), Canadian Standards Association (CSA) and American Iron and Steel Institute (AISI) requirements.

The product certification is validated by independent 3rd-party testing and inspection. This certification program is designed so that products qualifying for certification meet

the requirements of the National Building Code of Canada.

As of January 1, 2019, certification is a requirement for membership as a CSSBI Light Steel Framing (LSF) Manufacturer Member. It is also a requirement for a company to use the LSF load tables currently being developed. The CSSBI believes that this initiative will be an advantage for the Canadian construction industry.

The CSSBI represents the Canadian manufacturers of sheet steel building products. The list of current members and resource material can be obtained from the web site www.cssbi.ca

A steel building, characterized by the absence of load bearing walls, is intrinsically more versatile and flexible than other types of structures.





Dimensional Stability
 + Fire Resistance
 + Ductility
 = Durability

Steel is durable, safe, and strong. It is not susceptible to rot, termites, or mold. Steel structures require less material (both reduced weight and reduced volume) to carry the same loads as concrete or masonry or wood structures.



Design Versatility, Ease of Installation and Resilience

The versatility of steel gives architects and engineers the freedom to achieve their most ambitious visions, and provides contractors with a highly engineered, high-quality building material. Steel is used in everything from industrial to iconic structures, and is particularly suited to mid-rise construction, where turnkey framing solutions for virtually any type of residential or commercial building project are available.

Steel offers consistently high-quality standards, precision products and guaranteed strength and durability in the most challenging environments. Steel is produced to the most exacting specifications under highly controlled conditions, eliminating the risks of on-site variability, which is an inherent disadvantage with other building materials.

- Steel is dimensionally stable and can be manufactured to very tight tolerances, making it easier for engineers to use in building design, unlike softwood products which are susceptible to shrinkage due to varying moisture content and structural design properties that have recently been downgraded by up to 30%¹ due to changes in wood resource mix.

- Steel lends itself well to prefabrication, where the assembly of the individual steel elements takes place offsite under controlled, highly regulated and safe factory conditions where leading-edge technology delivers precision engineered components.



- Steel structures can be erected speedily. The predictability and accuracy of steel components, in addition to just-in-time site delivery, speeds up the process and allows follow on trades to get to work sooner, resulting in quicker building completion and earlier occupancy.



- Steel design benefits include longer spans, larger bays and wider frame spacing than wood or concrete construction. This allows for maximized usable floor space and large interior spaces that can be constantly adapted to cope with changing requirements of occupants.





- Steel framed structures are inherently ductile. Structures are designed to absorb energy produced by earthquake ground movement and wind by “flexing” or “deflecting” in varying degrees, depending upon the construction materials, design of the structure, quality of construction, level of engineering, and the applicable building code requirements.



- With consistent chemical and mechanical properties, steel behaves in a predictable manner when subjected to the structural loads imposed by high wind and seismic events. Bella Concert Hall and Taylor Centre for the Performing Arts.

¹ SFIA fact sheet “Downgrade of Southern Pine Values Increase Cost of Building with Wood”. November 2013.



Pre-painted Z275 (G90) galvanized steel, clads environmentally conscious self storage structure

The renovation of this 100-year-old 18,580m² (200,000 sq. ft.) Yarn Mill into an energy efficient storage facility, occurred over several phases. PHASE 1: Demolition started January 5, 2018 and occupancy on the first floor was July 25, 2018.

PHASE 2 begins this summer. Significant challenges were experienced in turning a structure which was built 100 years

ago into a state-of-the-art energy efficient building that would be NET ZERO on electricity and heating/cooling.

Consistent with the owners sustainability goals a geothermal energy system was installed that provides heating/cooling and in turn controls the humidity.

This Summer a Net Metering System will be installed that will produce electricity for their own consumption. To help keep the size and cost of these systems feasible, they had to look all the loads that would be created and try to reduce consumption of watts per square foot. Research was conducted to determine

cost effective ways to find the balance of costs between LED lighting, insulation, solar, geothermal, domestic water consumption and controls. The result, is an energy efficient, spacious and attractive facility. Objective achieved.

Green Storage Facilities are located across Ontario – Ajax, Bolton, Aurora, Keswick, Newmarket, Orillia, Toronto and now Hamilton.

DESIGN AND CONSTRUCTION TEAM

OWNER: Green Storage Solutions Inc. 905-424-2947

ARCHITECT & ENGINEER:

ATKINS + VAN GROLL Inc. 416-489-7888

CLADDING MANUFACTURER: Agway Metals 1-866-631-3239

CLADDING INSTALLER: Chaiss Sheet Metal 519-954-0936

PHOTOGRAPHS: Green Storage Staff and Google

Wall cladding utilized for the exterior cladding on the renovated Yarn Mill:

WALL CLADDING:
Agway Metals 7-175 and
HF12 siding coloured
QC28262 Black

TRIM: Agway QC10581
coloured Storage Green.







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