QIKIQTANI GENERAL HOSPITAL

Iqaluit, Nunavut

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A View to Healing

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.

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

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.

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 5,450m^2 (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.

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.

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

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 3,360m^2 (36,166 sq. ft.) of which 560m^2 (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 2,100m^2 (22,604 sq. ft.) is ArcelorMittal Dofasco's prepainted Z275 (G90) galvanized, coloured QC8317 White/White, supplied by Vicwest.

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.

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.

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.

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

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:
2100m^2 (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 2,800m^2 (30,139 sq. ft.), the curved roof is 560m^2 (6,028 sq. ft.).

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

Canadian Sheet Steel Building Institute
652 Bishop St. N., Unit 2A
Cambridge, ON N3H 4V6
Tel: (519) 650-1285
Fax (519) 650-8081
www.cssbi.ca

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.