Moose Cree First Nation Emergency Preparedness and Response Centre

MOOSE CREE FIRST NATION EMERGENCY PREPAREDNESS & RESPONSE CENTRE

JAMES BAY, ONTARIO

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DESIGN AND CONSTRUCTION TEAM

OWNER:
Moose Cree First Nation

ARCHITECT: Two Row Architect

CONSTRUCTION MANAGER:
FNA Building Systems Inc.

LIGHT STEEL FRAMING SUPPLIER:
Bailey Metal Products

STEEL DECK/STEEL ROOF CLADDING SUPPLIER:
Agway Metals Inc.

LOAD-BEARING AND WIND-BEARING WALL SYSTEMS: FNA Building Systems Inc.

FLOOR TRUSS AND ROOF TRUSS SYSTEMS:
FNA Building Systems Inc.

It was a race against time to build the facility to a closed-in state in one construction season – including the pouring of a 2,323m^2 (25,000 sq. ft.) engineered concrete slab. As well, fabrication and erection needed to be as simple as possible given the lack of a local highly-skilled labour force.

FNA Building Systems Inc. was chosen to supply the complete light steel framing (LSF) building system and provide construction management services for the project. The building structural system for the 2,583 m^2 (27,800 sq. ft.) EPR Centre used light steel framing for the load-bearing walls, wind bearing walls, steel roof trusses, steel floor trusses at the mezzanine, a steel deck with concrete topping at the mezzanine and prepainted steel roofing. FNA worked in conjunction with the Moose Cree First Nation to establish a government funded training program for local workers FNA President, Tom Lehari explains, "The EPR Centre of Excellence Light Steel and Energy Efficient Construction Training Project was implemented to provide trainees with high quality training and work experience in light steel and energy efficient construction techniques, as well as in commercial building construction and finishing work."

A temporary fabrication facility was established at Moose Factory and FNA shipped precut material and components, which were then assembled over the course of the winter months. Construction on site started in the spring. Wall panels were shipped to the site in July and assembly of the superstructure took place in July and August.

"The light steel framing system proved to be the logical choice in building this facility in the remote north," emphasizes Lehari, noting that shipping to Moose Factory is via train from Cochrane and then either by barge in the summer or ice road in the winter." So lightweight steel in knock-down form proved to be the most economical system to ship," remarked Lehari.

The lightweight nature of the LSF system also proved to be an economical advantage in erection of the foundations. The site consisted of large quantities of backfill material and a high water table. In winter, frost can reach ground depths of eight feet so conventional strip foots and foundation walls were cost-prohibitive. "FNA's engineers designed a six inch engineered floating slab to support the superstructure only possible because of the lightweight LSF system."

The LSF wall and roof assemblies, combined with rigid and spray foam insulation, contributed to the high energy-efficient levels of the building. The Walls are R32 and the roof is R52. The entire LSF wall and roof structure is effectively wrapped with insulation, providing for a tightly sealed building envelope and elimination of expansion, contraction or building movement.

All in all, the use of light steel framing was significant to successfully achieving a number of project requirements – from design flexibility for interior partitions and work, and speed and simplicity of construction to energy efficiency and sustainable development mandated by the Moose Cree First Nation. The superior energy performance of the building will contribute to approximately 53% lower annual energy costs than the Model National Energy Code of Canada.

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Precut material and components, were assembled over the course of the winter months in Moose Factory. Construction on site started in the spring. Wall panels were shipped to the site in July and assembly of the super-structure took place in July and August.

The superior energy performance of the building (wall R value achieved was 32 and the roof R Value achieved was 52).

Quantities of framing involved:

Total exterior wall 256m (840 linear feet)

Total exterior
152.4mm (6") stud 3,456m (11,340 linear feet)
Material – Grade 33 (MPA230)

Total steel deck 4,366m^2 (47,000 sq. ft.)

Total pre-finished metal roof 4,180m^2 (45,000 sq. ft.)

Roof truss system 1.36m (39'-0") with spans

Standing seam steel roof .45mm (.0179") prepainted galvanized, coloured QC8260 Slate Blue, Agway profile 6-150F

Roof deck .76mm (.0299") ZF075 galvanneal Agway profile RD36

Mezzanine .76mm (.0299") ZF075 galvanneal Agway profile CD36 composite deck.

The construction season in remote northern Ontario is relatively short – beginning, on average, in June and ending early October with the winter freeze. That presents an incredible challenge to any major building project, but the use of steel was the ideal solution for a superstructure in Moose Factory, Ontario in the James Bay region.

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