



CALGARY WATER CENTRE CALGARY, ALBERTA

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ArcelorMittal Dofasco Steel Design, 2009)

DESIGN AND CONSTRUCTION TEAM

CLIENT: City of Calgary

ARCHITECTURE: Manasc Isaac Architects Ltd. In cooperation with Sturgess Architecture

STRUCTURAL: Read Jones Christoffersen

MECHANICAL AND ELECTRICAL: Keen Engineering (now Stantec Consulting Ltd.)

CIVIL: Urban Systems Ltd.

LANDSCAPE: Carlyle & Associates

CONTRACTOR: Dominion Construction

COSTING: Spiegel Skillen + Associates

ACOUSTICAL: ACI Acoustical Consultants

STEEL CLADDING & DECK SUPPLIER: Roll Form Group

STEEL CLADDING FABRICATOR & INSTALLER: Thermal Systems KWC Ltd.

STRUCTURAL STEEL: Metal Fab Industries Ltd.

PHOTOGRAPHY: Robert Lermeyer Photography Inc.

Curved Steel Roof adds Artistic Flair and Energy Efficiency



Aerial view of the Calgary Water Centre with the curved AZM165 Galvalume standing seam roof, inspired by the curvilinear nature of the adjacent road, which was patterned by the historic Grand Trunk Rail Line on the site.

“Who would have thought an old brownfield site in Calgary’s south end could be transformed into such a magnificent, sustainable structure?

Answer: a design team spearheaded by Edmonton’s Manasc Isaac Architects Ltd. and Calgary’s Sturgess Architecture. “We were inspired by the curvilinear nature of the adjacent road, which was patterned by the historic Grand Trunk Rail Line on the site. The long narrow building addresses the LRT Station on the west end, and the operations area on the east end of the site,” said Jeremy Sturgess, architect in charge of design on the project. Located on 25th Avenue S.E. and Spiller Road, the 15,421m² (165,990 sq. ft.) Water Centre is home to Calgary’s Water Resources and Water Services’ professional and field staff.

The focal point of the \$43 million project is a 4,645m² (50,000 sq. ft) curved standing seam roof structure clad with AZM165 Galvalume Plus™ steel over galvanized steel deck supplied by the Roll Form Group. The curved roof and wall, nicknamed the ‘woof’ by the client, acts as a blanket against the north winds and protects the garden to the south.

The building’s vertical walls are covered with a steel shingle wall cladding system with corrugated cladding used on the south exterior walls underneath the overhang. All roof/wall cladding products are ArcelorMittal Dofasco’s AZM165 Galvalume Plus, installed by Thermal Systems KWC Ltd., who formed both the shingles and corrugated panels for the vertical walls, as well as the standing seam roof. Designed with a

cantilever truss system, the roof supports the curved steel cladding, and provides shading to the fourth storey glass below.

“We really appreciated the flexible forms and visual lightness that we could achieve using a steel structure, both for the curved roof that shelters us from the north wind, and for the atrium structure on the south,” said Manasc Isaac principal, Vivian Manasc.

The Galvalume Plus steel clad roof allows the City to collect rainwater from its gutters and trowels, diverting it to a large underground cistern for grey water use. It is an integral part of the overall water management system of the building.

“The Water Centre certainly hits the mark in terms of its very low water use and low energy use,” said Sturgess architect, Lesley Beale. “The City also flushes the water meters to calibrate and test them, and all that water is used to flush the toilets afterward. “Coloured windows are supported by steel Vierendeel trusses, which vertically span four metres (13 ft.) to support the glazing. “If you look at a profile of those trusses, I think they are quite elegant from an architectural standpoint. It is quite a striking visual feature in the building,” said structural engineer, John Charrett. Fourth floor visitors can gaze at the vaulted roof and see the steel trusses, giving them an appreciation of the structure.



West end of the Water Centre showing maximum 4.8m (15.7') high Warren truss spanning from 15m (49') high HSS 610 column to cantilevered truss projecting from building. Also visible is the ASTM653 Grade33, Z275 (G90) galvanized steel deck and AZM165 Galvalume Plus shingle wall panels.



East end of building with curved roof showing glass windows on curved surface, W530 curved section soaring to a height of 20m (65.5') above floor supported by W530 sections cantilevered from the face of the building.

SPECIFICATIONS

CURVED ROOF WALL CLADDING:

AZM165 Galvalume Plus standing seam steel .61mm (.0239") – 4,645m² (50,000 sq. ft)

STEEL SHINGLE WALL:

AZM150 Galvalume Plus steel .61mm (.0239") – 2323m² (25,000 sq. ft)

CORRUGATED WALL:

AZM165 Galvalume Plus 61mm (.0239") – 465m² (5000 sq. ft).

GALVANIZED STEEL DECK:

ASTM A653 Grade 33, Z275 (G90) Galvanized 6039m² (65,000 sq. ft.)

STANDARD ROOF DECK:

38mm (1.5") deep by .76mm (.0299")

ACOUSTIC DECK:

38mm (1.5") deep by .76mm (.0299") and 38mm (1.5") deep by .91mm (.036")

STRUCTURAL FRAME:

5m (16 ft.) deep trusses cantilevering 13.6m (45 ft.) consisting of W200 x 46 (W8 x 31) top chords, W310 x 79 (W12 x 53) bottom chords, W200 x 46 (W8 x 31) verticals and 100 x 100 x 8 (4 x 4 x 3/8) double angle diagonals. 38mm (1.5") deck curved about weak axis spanning to C200 x 17 (C8 x 11.5) channels and W250 x 33 (W10 x 22) beams.

Steel to Canadian Standard CAN/CSA G40-21-M



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