

Fast + Epp

JASPER PLACE LIBRARY

Edmonton, Alberta



CANADIAN | CONSULTING
engineer



ASSOCIATION OF CONSULTING
ENGINEERING COMPANIES
BRITISH COLUMBIA

Jasper Place Library

Edmonton, Alberta



CANADIAN CONSULTING ENGINEERING: Awards 2014 Competition

Year Completed: 2013

Category A: Buildings

Entering Firm: Fast + Epp — Structural Engineering

Project Leader: Derek Ratzlaff

Project Owner: The City of Edmonton
(contact: Chris Kiriakides, Project Officer)

Project Architect/Client: Hughes Condon Marler Architects
(contact: Stuart Maddocks, Associate)

Consultants: Williams Engineering, BTY, & P. Machibroda Associates
(contact: Chad Musselwhite)

Contractor: Stuart Olson Dominion

Fast + Epp

201 - 1672 West 1st Avenue
Vancouver, BC V6J 1G1
T: 604.731.7412
F: 604.731.7620
afaulkner@fastepp.com
ATTN : Alison Faulkner

JASPER PLACE LIBRARY – Fast + Epp

75-Word Summary:

Jasper Place Library is a 14,000 square metre replacement of an existing facility. The new structure was built with the idea of being the new social heart in an older suburban neighbourhood. Predominantly cast-in-place concrete on piles, the primary feature is the expressive plate concrete roof punctuated with skylights that clear spans and appears to float above the entire library space. The Library's shape and palette make it a sparkling landmark, visible from blocks away.

Project Highlights:

Innovation

The City of Edmonton is a client that recognizes the value of building high-quality civic facilities for its citizens. Hence the architectural response for their newest library called for a striking free-form clear span facility with maximum daylight penetration.

The most innovative aspect of the roof structure lies in the development of its form. Concrete folded plates are an unusual but not completely new structural form. In this instance, the folded plate concept is taken to a new level. The roof structure consists of curved waves (vs. the typical flat folded plate) and cascades in to support columns at 2 sides that eliminate the need for any further shear wall or cross-body elements. The rolling waves are also punctuated with generous openings, something not usually seen in folded plate design. Finally, generous cantilever roof overhangs were incorporated into the design and were only made possible through the incorporation of new structural thermal break technology that was imported from Germany.

Complexity

The unusual structural design consists of a concrete roof slab that cascades into concrete columns at two sides and is supported by light steel columns at the front and back. The roof relies on the deep wave form to clear span the space and generous allowance was made for skylight openings. This design concept is not reliant on additional shear walls or bracing for lateral stability, with the result being a structure that appears to float under maximum daylight penetration.

Close collaboration with the contractor to establish forming and pouring procedures was critical to the success of the project. The impressive cantilevered roof structure over the entry was even more challenging with the inclusion of thermal isolators imported from Germany (new technology in Canada) thereby avoiding the detrimental effects of thermal bridging in the cold Alberta climate and allowing the concrete to be exposed inside and out. Constructability challenges were also identified early in the design process and the City solicited an expert opinion to advise whether the design was both structurally safe and achievable in the Alberta construction climate. Fast + Epp showed the Client and peer reviewer precedent cases of

complex concrete structural forms while explaining the inherent logic of the design — including the inclusion of post-tensioning in the trough regions to control deformations. However, it was not until a satisfactory construction procedure was proposed, accompanied by detailed costing that these fears were adequately allayed and the go-ahead for final design and construction was given.

Social and/or Economic Benefits

With the digitalization of reading material becoming more popular, the City of Edmonton wanted to create a space that would house tangible reading material, and more importantly serve as a social space for the community. The final design features an open space devoid of columns and allows for the opportunity of maximum social potential in the coming years.

The project achieved economy of design by incorporating flat surfaces between the peaks and valleys on the surface of the roof. The second step was to propose pouring the flatter slopes including the valleys without top forms prior to pouring the steeper sloped roof and peak portions. This simplified the formwork and enabled pouring of the sloped roof surfaces without excessive wet concrete pressures in the trough regions. Close collaboration with a construction manager and the design team yielded the desired result.

Environmental Benefits

Targeting LEED Silver, the aesthetically striking structural form and ample daylight of Jasper Place Library has resulted in a happy social environment for users. The Library opens up at the south to gather light under a generous cantilever of its roof, but dips down to near ground on east and west sides to control heat gain from low-angle sun. In contrast to the curvilinear roof, the library's main entrance is a box lined with wood inside and UV-proof composite wood panels outside, a rectangular form that erupts unexpectedly from a wall of glass striated by sun-shading structures. Inside, the concrete is balanced by wood finishing on the mezzanine and community room. The branch reused the old wooden beams from the former facility; they've been sliced thin and placed as a wooden panelling. With the incorporation of thermal isolators, the design was preserved and sustainability value from energy savings was achieved.

Meeting Client's Needs

The City of Edmonton desired a library that would act as the civic heart of a neighbourhood, and that its architecture would be reflective of that. The goal was to create a flexible, open space that could adapt to the needs of the library as it evolves in the future. The overall result is a library organized by a large social space sheltered by a column-free undulating roof form. It is an open, inviting and memorable public space that provides a strong public presence in a neighbourhood that has lacked meaningful indoor public space.



Figures 1 & 2 – Exterior views of Jasper Place Library, with its undulating free-form roof, an iconic new addition to the City of Edmonton. Photo credits: Stephan Pasche



Figure 3: Construction of post-tensioned troughs, which allowed for an undulating free-form concrete roof. Note Isokorb material at edge of roof. Credit: Hughes Condon Marler



Figure 4: Construction of the exterior wall/ roof edge. Credit: Fast + Epp



Figure 5: Large overhang using two-way stiffness of the concrete slab and geometric stiffness of wave form to provide support. Credit: Fast + Epp



Figure 6: Interior of Jasper Place Library, a bright and welcoming space. Credit: Fast + Epp



Figure 7 & 8: Interior of Jasper Place Library, Credit: Fast + Epp