Diamond and Schmitt Architects

BACKGROUNDER

September 6, 2011

MONTREAL CONCERT HALL

The Montreal Concert Hall was built by the Government of Québec as a Public-Private Partnership (P3) with SNC-Lavalin, through its subsidiary firm, Groupe immobilier Ovation. This is the first P3 project in Quebec's cultural sphere.

Private Partner

SNC-Lavalin is one of the world's leading engineering and construction companies and is a major player in the ownership and operation of infrastructure services. Groupe immobilier Ovation oversaw the engineering and construction of the concert hall and secured its financing. As part of the P3 agreement, the company will act as building manager for the next 27 years.

MCCCF Acoustician and Theatre Consultant

La Ministère de la culture, des communications et de la condition féminine du Québec (MCCCF) retained Artec Consultants Inc. to create the acoustic program. Led by Tateo Nakajima, Artec ensured the acoustic objectives established under the leadership of the late Russell Johnson, founder of Artec, were maintained.

Architect and auditorium design team

Lead Architect Jack Diamond, Principal with Diamond and Schmitt Architects, Inc., and Project Architect Michel Languedoc, Principal Architect at Ædifica, directed the design team. They relied crucially on acoustician Robert Essert of Sound Space Design Ltd. in London, England, theatre planner Robert Campbell of Fisher Dachs Associates in New York, and Gilles Arpin, architectural lighting designer of Éclairage Public in Montreal.

Engineers

Civil, Structural, Mechanical, and Electrical engineers: SNC-Lavalin Inc.

Important construction phases

May 2009:	Start of demolition work on the former underground parking lot
July 2009:	Foundations poured
May 2010:	Completion of the concrete structure
July 2010:	Completion of the steel structure
Nov 2010:	Installation of scaffolding for acoustic reflectors setup
Winter 2011:	Installation of acoustic reflectors
Summer 2011:	Architectural work in the auditorium and reception room
Sept 7, 2011:	Montreal Symphony Orchestra inaugural concert

Key elements about the concert hall

- Seating capacity: 1,900 seats and up to 2,120 seats if the choral seating area is used with additional standing room on the top tier
- Stage will accommodate up to 120 musicians and a chorus of up to 220 voices
- Total surface area: 19,187 square meters (206,500 square feet)
- Auditorium volume : Approx. 29,000 cubic meters
- Distance from front of stage to back row of upper balcony: 39.2 metres (129 feet)
- 180 rubber isolators impede structure-borne vibration from entering the hall
- Variable acoustic design with moveable baffles and panels in the ceiling to accommodate a range of musical styles
- All surfaces in the auditorium except the ceiling are clad in FSC certified beech wood

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Architectural / Acoustical Design

The Montreal Concert Hall is a unique room shape, designed especially for the OSM and other music performances. While it owes its basic tall, narrow proportion to the success of the classic "shoebox" design, it is definitely not a shoebox design. The auditorium is shaped with carefully optimized curved walls and balconies that direct and spread the sound to create intimacy and involvement between the artist and the audience in addition to strong sightlines. This beautiful and functional form is carried through to the outside of the hall, legible from the lobbies and from the exterior where the scalloped wooden form of the hall rises above the roofline and serves as a beacon to the wood-lined warmth inside.

The public space of the concert hall has an animated, accessible presence at ground level and incorporates the underground access from the subway and parking. A large transparent façade on the plaza as well as on the adjacent street, rue Saint-Urbain, makes this the only building on Place des Arts to present itself openly both onto the square and the surrounding neighbourhood. A sense of accessibility continues inside with a double-height reception room, side lobbies and a strong visual sense of the activity within through extensive glazed curtainwall.

In counterpoint to the transparency and accessibility of the lobby spaces, the auditorium celebrates its enclosure. A monochromatic palette of colours creates a calm, cohesive and elegant environment in the hall to draw the audience's attention to the performance. All surfaces in the auditorium except the ceiling are clad in wood, providing sound reflection, diffusion and a human scale. There is extensive use of wood trim and covers on the walls, balcony fronts, floors, seats and doors. A transition from wood to plaster ceiling panels provides visual relief, textural richness and proper sound reflection.

Clear sightlines and audience comfort are equally important and are achieved by unremitting attention to the concert-going experience. Each seat has its own air conditioning supply. This distribution method is specifically designed to generate no noise or air movement, which could affect sound quality in the hall.

The auditorium is a 'box-within-a-box' where the hall is structurally separated from everything around it and sits on rubber and steel pads that impede the transmission of vibration and sound from the outside. Further sound isolation is achieved by innovative design that prevents all noise generated by mechanical equipment from entering the auditorium.

The back-of-house functions, the green room, orchestra lounge, music library, rehearsal spaces and Maestro's suite are clear and defined on the exterior, forming a rhythm of planes on the north façade of the building. Traditional materials that speak of Montreal's built heritage are in evidence: grey limestone masonry sits on a black granite base and enclose the northern sides of the building.

A simple relationship connects the stage, loading dock, orchestra seating, the lobby and plaza outside: they are all at grade, which provides straightforward access to the public and ease of operations for moving to and from the stage. However, this natural sequence was initially assumed to be impossible, since the stage at grade meant the concert hall was very close to the noise of the subway, parking lot and street. Believing that all the criteria could be met without sacrificing important architectural relationships, Diamond and Schmitt Architects accompanied by their acoustic consultant Sound Space Design Ltd. and Fisher Dachs Associates, in collaboration with SNC-Lavalin, led a detailed acoustical study to prove the noise isolation was attainable with careful design.

The unique form of the Montreal hall comes from a collaborative "sculpting" process between Diamond and Schmitt Architects and Sound Space Design, not unlike the "fairing" of a boat hull or a racing car. It is a shaping process informed at every step by decades of concert hall design experience and technology in the service of musical excellence to deliver a supreme acoustic environment and an intimate relationship between performers and audience. The arrival of this hall now completes the composition of Place des Arts, the pre-eminent central square for cultural activity in the Quartier des spectacles in downtown Montreal.

Acoustic Flexibility and Performance Systems

The concert hall is designed primarily for orchestral music performance with secondary usage both for chamber music as well as amplified music performances and events. For acoustic concerts, the amplification system and components can be entirely hidden through a series of rigging equipment and motorized doors. The ability to adjust the performance environment of the concert hall – both in terms of the acoustic environment as well as the physical performance environment for the artists, is a key design component reflecting the sheer breadth of the repertoire of the Montreal Symphony Orchestra, as well as the other uses in chamber music and recitals, and other events with sound reinforcement that are expected to take place in the concert hall.

The Adjustable Systems of the concert hall include elements that tailor the stage size to the ensemble performing, and elements that allow the acoustics environment to be adjusted.

Orchestra platform geometry

• The forestage extension lift allows for the orchestra performance area to be increased when necessary to accommodate larger ensembles. Audience seating on mobile wagons can be brought onto the lift when at audience floor level so that the capacity of the hall can be maximized when the extra stage space is not needed. The lift can also be used as an orchestra pit.

• A Mobile chorus/audience seating wagon is located at the rear of the orchestra. This wagon can be pushed back under the permanent choral seating area when extra orchestra performance area is needed and there is no chorus.

Variable Acoustics

• A nine-part system of individualized motorized reflectors, weighing between 2,000 and 25,000 kg. over the performance area and main floor seating area allows the acoustic environment to be adjusted to suit the scale and nature of the performance. The reflectors serve both to distribute sound energy down to the stage and throughout the audience but also to control the connection (or coupling) between the acoustic volume below and above the reflectors.

• A system of motorized sound absorptive fabric curtains covering most of the wall surfaces of the hall allows the acoustics environment to be adjusted both for the range of unamplified music repertoire as well as for amplified music.

• The concert hall is also equipped with Theatrical Lighting equipment and infrastructure, as well as Sound and Communication Systems equipment and infrastructure appropriate for the range of uses of the concert hall

• The concert hall is equipped with a system of motorized rigging equipment and infrastructure which will, aside from controlling the positioning of the motorized reflectors, support the use of temporary rigging for scenery or lighting and other occasional uses.

The Organ

The organ design by Casavant Frères in collaboration with Diamond and Schmitt and Aedifica Architects is integral to the hall: the array of organ pipes is where architecture and making music meet. The result is a bold, confident composition, an asymmetry of exuberant diagonals that – like the concert hall itself – is a contemporary expression of fundamental forms that work well. The organ is being manufactured in Quebec by Casavant Frères. The delivery of the organ is scheduled for Spring 2014.