

6th Annual Green Dot Awards

Manitoba Hydro Place

KPMB Architects

KPMB was founded in 1987 by Bruce Kuwabara, Thomas Payne, Marianne McKenna and Shirley Blumberg. The firm has since earned hundreds of awards for architectural excellence including 14 Governor General's Medals, Canada's highest honour.

In the last decade, KPMB has played a major role in the development of Toronto as an internationally recognized centre with projects for the Bell Lightbox for the Toronto International Film Festival, Canada's National Ballet School, the Gardiner Museum, the Young Centre for Performing Arts and the Royal Conservatory TELUS Centre. KPMB has also contributed to projects across Canada including the Canadian Museum of Nature in Ottawa, Manitoba Hydro Place (LEED Platinum) in Winnipeg and the forthcoming Rемаi Art Gallery of Saskatchewan in Saskatoon. KPMB is currently working on projects for Princeton University, Boston University, Northwestern University, the University of Pennsylvania, the Aga Khan Foundation of Canada and is part of the consortium to design and build the 2015 Pan American Games Athletes' Village

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Manitoba Hydro Place, 2009

Winnipeg, Manitoba

Project Credits

KPMB Architects (Design Architects), Smith Carter Architects & Engineers (Executive Architect), Transsolar (Specialist Energy/Climate Engineer), Prairie Architects Inc (Advocate Architect)

Project Background

Manitoba Hydro is the Crown corporation and the primary energy utility for Manitoba. In 2002, as part of the negotiated purchase of Winnipeg Hydro, the City of Winnipeg required that Manitoba Hydro participate in the City's downtown urban revitalization strategy by consolidating 2,000+ employees from 15 leased suburban offices into one new building in the centre of the city. Winnipeg's climate makes it one of the coldest cities with a population over 500,000 in the world. Temperatures drop to -35 degrees Celsius for almost half the year and can exceed +45 degrees Celsius with the humidex during the summer. It is also one of the sunniest and windiest places in Canada.

Sustainable Materials

The building's material palette references man-made and natural power sources as well as associations with Canada's northern landscape. Exposed architectural concrete and locally quarried Tyndall stone relate to Winnipeg's urban fabric of masonry buildings. Reclaimed Douglas fir from the former building that occupied the site is reused for soffits and benches. Large portions of the structure were left exposed to increase the conductivity of the radiant concrete mass.

Narrow floor plates and tall floor-to-ceiling glazing allow sunlight to penetrate into the core. A double façade curtain-wall system made of low-iron glass forms a one metre wide buffer zone. It is comprised of a double-glazed outer wall and a single-glazed inner wall which insulates the building against heat and cold.

Energy/Water Efficient

The LEED Platinum, climate responsive design is the outcome of a formal Integrated Design Process and the synthesis of massing, orientation, and exposed thermal mass with immediate digital analysis and building management computer systems: Compared to the average office tower in North America, it is recording over 70% energy reduction. Manitoba Hydro's usage is under 85kW.

Within the splay of the two towers that form the building massing, a series of three, six-storey south atria, or winter gardens, form the lungs of the building, drawing in outside air and pre-conditioning it before it enters the workspaces through adjustable vents in the raised floor. Depending on the season, a 24 metre tall waterfall feature in each of the atria humidifies or dehumidifies the incoming air. During colder temperatures, recovered heat from exhaust air, and passive solar radiant energy are used to warm the fresh air. The conditioned air is drawn through the raised floors into the office spaces through under floor fan units. Building occupants, computers and other sources of heat cause the air to rise, which is then drawn north and exhausted by the solar chimney. In the shoulder seasons, the building relies solely on outdoor fresh air through the use of automatic and manually operated windows.

Manitoba Hydro Place also has the largest closed loop geothermal system in the province. 280 boreholes, each 150 mm (6") in diameter, penetrate the site 125 metres (400 ft.) underground, circulating glycol which is cooled in the summer and heated in the winter by the ground source heat exchanger. Water is circulated through the heat exchanger and distributed through thermal mass of the concrete structure which in turn heats or cools the space consistently.

Community Impact

The building occupies a previously underutilized urban block in the centre of Winnipeg and faces onto Portage Avenue, the

city's main street. Portage Avenue is typical of Winnipeg's wide thoroughfares which were planned to emulate the scale of Chicago's Michigan Avenue. The site was selected for its proximity to prominent downtown destinations, including The Forks (a historic aboriginal meeting place and green space at the confluence of the Red and Assiniboine Rivers), as well as to the city's sheltered pedestrian system. More than 95 percent of the bus routes pass this address, including routes to the suburbs where 80 percent of Manitoba Hydro employees live.

With a vested interest in the downtown, leasing opportunities in the base building are limited and no office cafeteria was included in an effort to stimulate the support of local businesses, and to encourage staff to experience their city. Restaurants and bars are already reporting a tremendous increase in revenue as a result of the influx of over 1600 Hydro employees to the area.

Design

The design is the outcome of a formal Integrated Design Process (IDP). Form, orientation and massing are seamlessly integrated to capture maximum passive energy from Winnipeg's extreme climate. The form takes the shape of a capital A letter and consists of two glass office towers set on a stepped masonry-clad podium scaled to relate to the city's historic fabric.

The 21-storey, 76,500-square-metre high-rise office tower accommodates 2,000 workstations and includes a three- to four-storey-high podium with

At the north end a 115-metre-tall solar tower marks the main entrance on Portage Avenue, and serves as a symbol, visible across the city, of Manitoba Hydro's commitment to energy efficiency and carbon emission reduction.

The primary purpose of the project was to create a healthy, supportive place of work.

The objectives for energy efficiency, signature architecture, urban revitalization emerged from this goal. Recognizing indoor air quality, natural light and views are essential to well being, the design achieves 100% fresh air, 24/7. In addition the amalgamation of 12 leased offices in the suburbs into one location. 70% employees are now also taking public transit and over 12,000 visitors have toured the building since it opened in 2010.

The design proves sustainable design thinking must be attached to human experience, and is beyond metrics and ratings. The top of the solar chimney is now an icon on the Winnipeg skyline and highly visible on the approach to the downtown from the airport on Portage Avenue.

Land Use

The glass towers are set back to mitigate mass and shadow impact on Portage Avenue. The towers fuse at the north and splay open to the south for maximum exposure to the abundant sunlight and consistently robust southerly winds unique to Winnipeg's climate.

By siting the building on a 45-degree angle to face due south, outdoor space was saved and converted into a new urban park. The overall orientation also optimizes visual connections to the city's legislative buildings and The Forks, Winnipeg's historic centre. Inside, a three-storey publicly accessible galleria bisects the solar axis of the podium and creates a sheltered route through the full city block. Instead of a conventional lobby, the galleria allows for the daily flow of 2,000 employees as well as creates a new indoor public gathering space for the city.

The podium rooftops feature deep soil intensive green roofs and accessible terraces, creating a lush landscaped outdoor amenity for employees, while also reducing stormwater runoff and providing additional thermal insulation. A reflective coating on the tower rooftops reduces the summer season cooling load and the urban heat island effect.



Aerial view

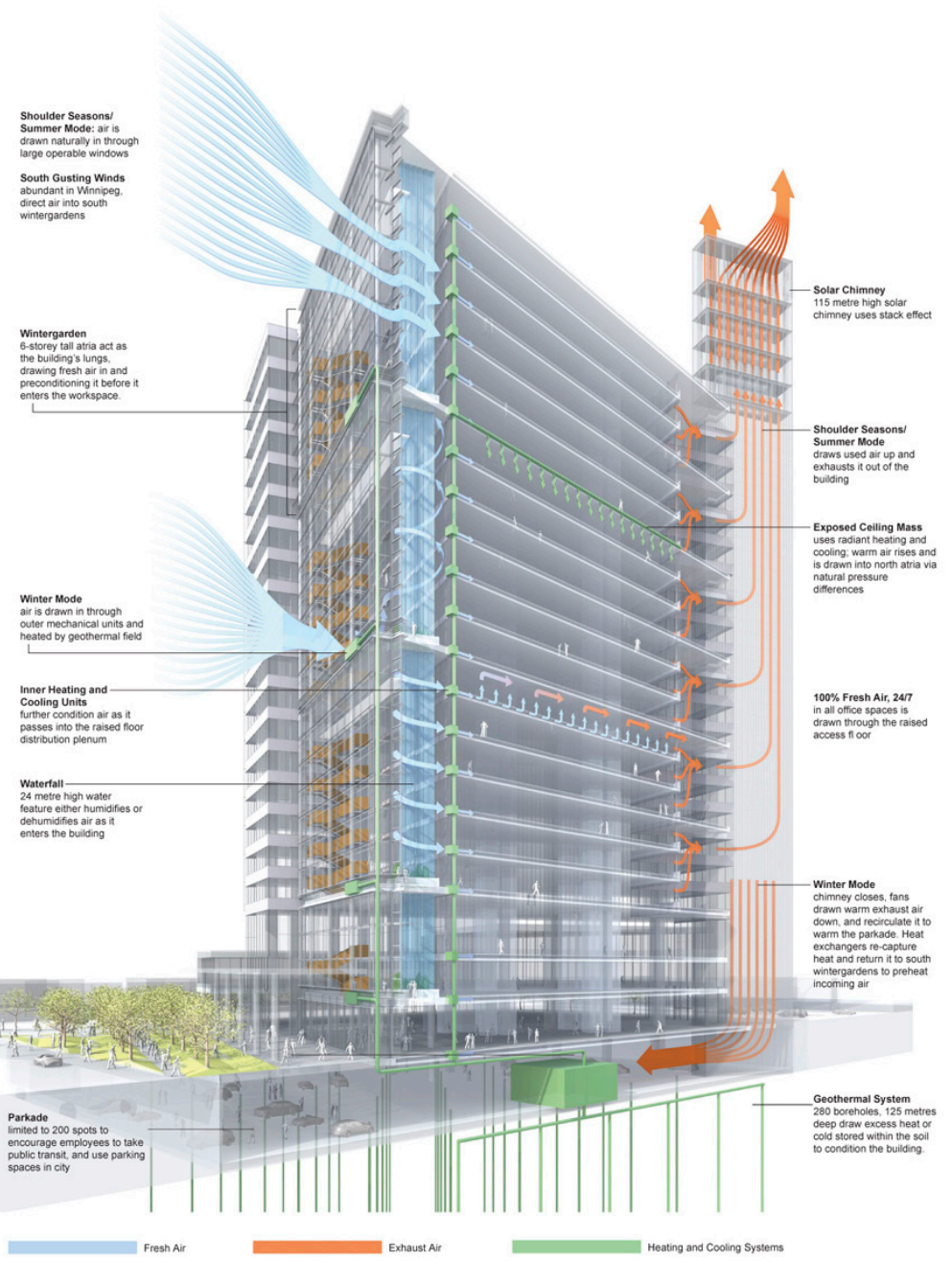


Diagram showing passive energy systems (left); view of south elevation (right)

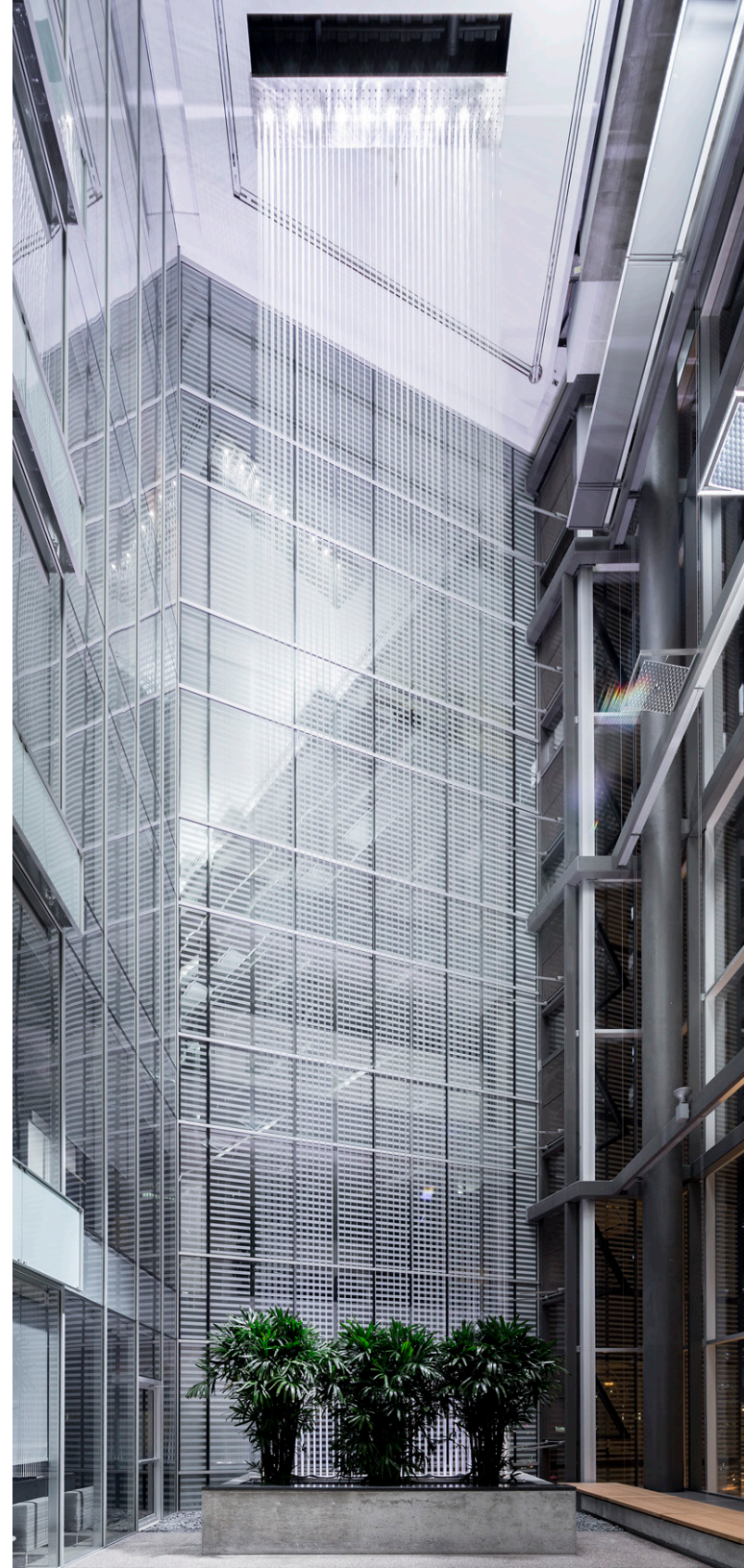
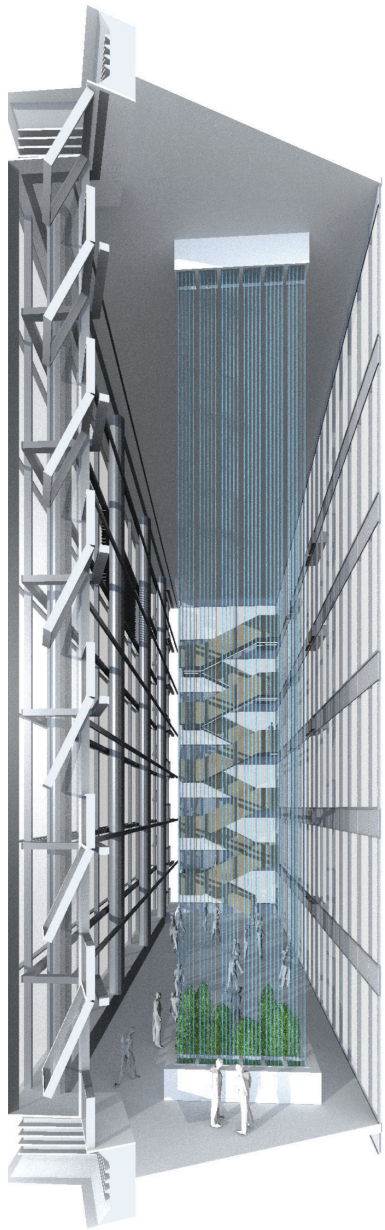
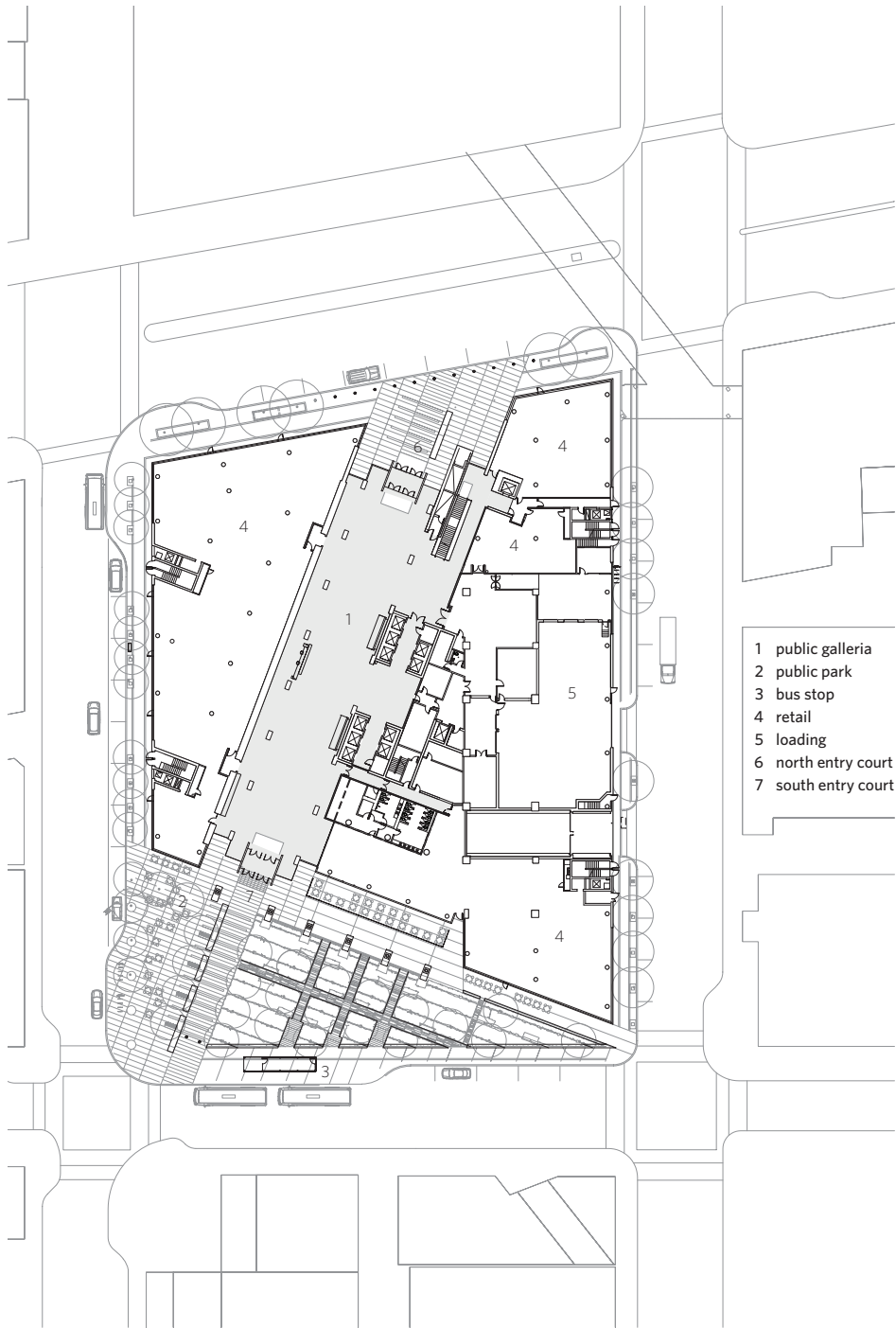
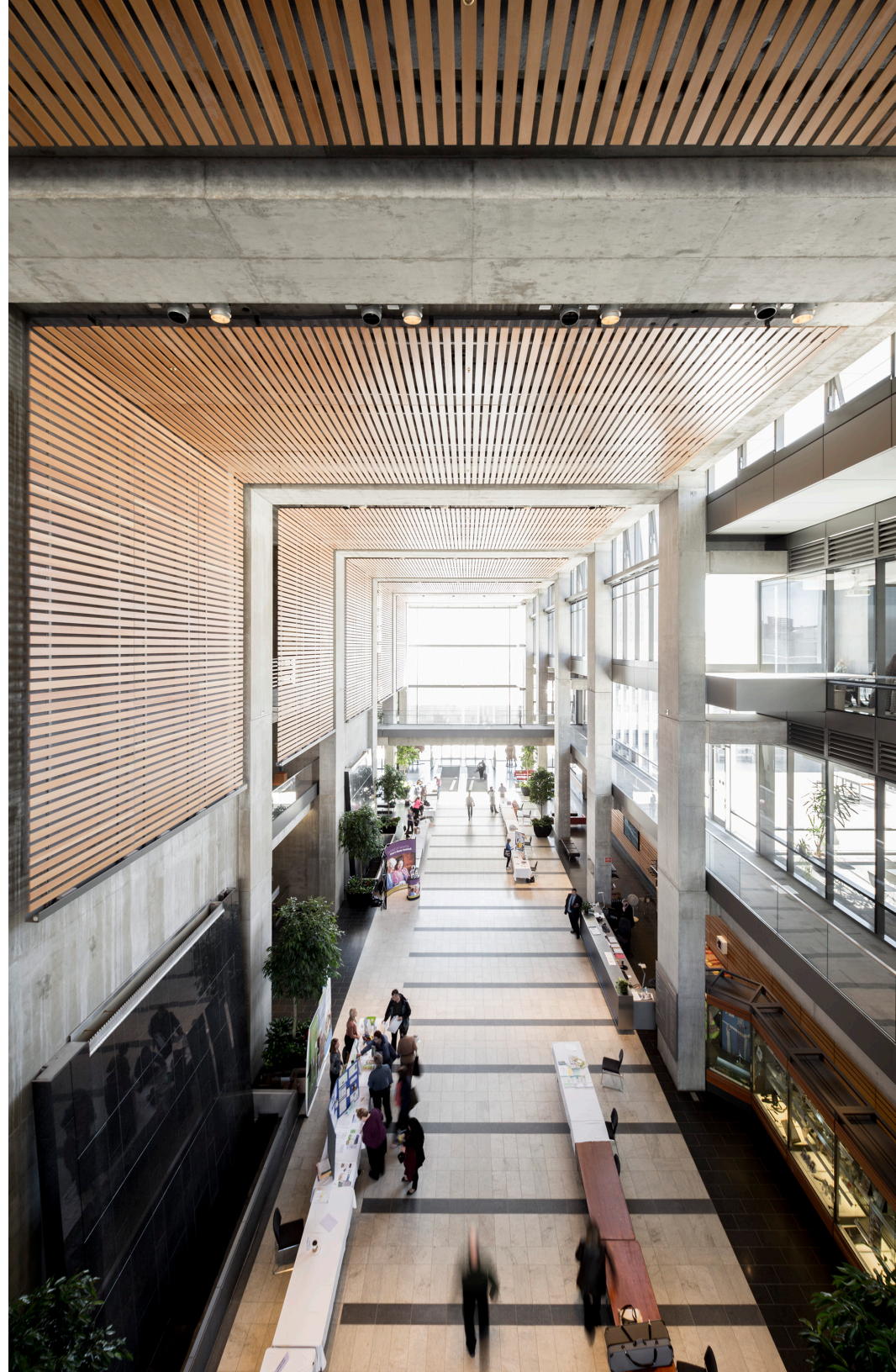
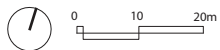


Diagram of atrium (left); typical six-storey atrium (middle); wintergarden with functional water element (right)



- 1 public galleria
- 2 public park
- 3 bus stop
- 4 retail
- 5 loading
- 6 north entry court
- 7 south entry court

Ground floor (left); public galleria (right)





Public park space in front of south facade (top);
Public gallery and entrance diagram (bottom)