



2019 CANADIAN CONSULTING
ENGINEERING AWARDS

Edmonton Tower

Category A: Buildings



Edmonton Tower

Valued at over \$200 million, the Edmonton Tower is a 618,000 square foot glass edifice located in the bustling ICE District. Ascending 27 floors, this LEED® Gold, AAA commercial office development has a unique curved façade, floor-to-ceiling perimeter glazing, expansive tower floor plates, and a grand public lobby. Bringing ICE District Joint Venture's goals to life, Stantec seamlessly integrated engineering systems with contemporary architectural assemblies for this transformative project, home to over 2,000 hard-working Edmontonians.





Project Highlights

Q.1 INNOVATION

In response to a City of Edmonton (the City) RFP for consolidated office space, ICE District Joint Venture, along with Stantec's architectural, structural, electrical, and sustainability teams, Smith + Andersen mechanical consultants, RWDI, and Thurber Engineering worked to develop schemes for hallmark project within the booming ICE District. Brought to life by PCL Construction, Edmonton Tower reflects the project team's innovation.

A seamless transition from street to lobby, expansive floor-to-ceiling glazing, and exterior terraces work together to achieve the key design intention to dissolve barriers between the interior and exterior— but not without challenge. A drop-in floor was required to step unencumbered from inside to out the level 27 executive patio terrace. To mitigate load transfer inconsistencies, our team secured some of the largest hot rolled structural sections available and cut the top half off for the step. We added significant strengthening plates to support the floors above and created a smooth transition from office to panoramic outdoor views.

Our electrical team designed two distinct LED lighting features to introduce dramatic and iconic flare to the downtown Edmonton skyline. First, the gentle and elegant curvature of the north and south façades are highlighted by a wash of light that extends the entire height of the building.

At the top of Edmonton Tower, facing North, thousands of programmable LED lights are arranged to appear as an impressive, six-storey, cohesive screen that made for a complicated and meticulous installation process—but well worth the result.

Today's landlords and tenants want accurate and reliable electricity consumption billing. Edmonton Tower's interior tenant space is connected to the central electrical consumption revenue metreing system. The customized system monitors all electrical loads serving each area and produces accurate billing in accordance with Revenue Canada requirements. The Edmonton Tower tenant sub-metering arrangement was suggested by our team to offer accuracy and peace of mind for tenants.

Finally, Edmonton is known for its wild weather. ICE District developments mandated a stormwater release rate that our team adhered to by developing a stormwater management system to temporarily store excess runoff in a cistern, four-storeys below the lowest parking level. The flow control device limits the discharge into the City's existing system, to the allowable rate of 35 L/s/ha during the 1:100-year, four-hour storm event. This innovative system will be used as a benchmark for all stormwater management systems in the ICE District.



Q.2 COMPLEXITY

Edmonton's Tower's unique form brought unique challenges. Similar to the way a bent stick in compression would be inclined to snap at the middle, our team eliminated this vulnerability through sloped tower columns and a loading condition the floor itself helped to mitigate. Large drag struts were designed into the core walls to resist this significant force while floor beams transferred these forces from the bode perimeter to the structure's core. Specific floor beams were strategically chosen to permit mechanical and electrical distribution to pass through coordinated openings resulting in an interwoven ceiling plenum. This meticulous coordination, while only saving inches, delivered exponential savings when extended over the full course of construction, and operation.

As one of the largest raft slab pours in Edmonton's history, at 11 hours long and 2600m³ of concrete, special measures were taken to ensure it didn't overheat, and to maintain the expedited project timeline. By using real-time temperature data, the contractor could proceed with backfilling around the raft slab and constructing the above parkade while monitoring curing.

The Edmonton Tower steel structure represents 4,600 tons of steel—an immense amount to be installed on site in the heart of a lively downtown hub. The tower columns, some weighing up to 3,600 lbs, navigated busy downtown streets and managed to arrive on a just-in-time delivery schedule.



Q.3 SOCIAL AND/OR ECONOMIC BENEFITS

For years, this site welcomed suburban commuters with a big box store and ample surface parking. The development of the Edmonton Tower site represents a shift in Edmonton's urban development trends. Its skillful design sets a new architectural benchmark against which all future development will be measured.

Further benefit to Edmonton's community at large comes from the injection of vibrancy into our downtown core and associated economic stimulus. By drawing more people into the area every day, Edmonton Tower provides new potential patrons for surrounding businesses and restaurants. By welcoming increased numbers of pedestrians to the ICE District, the Tower is encouraging the support of local businesses and industry.

The interconnecting podium floors bring pedestrian circulation at grade together with the second level pedway concourse and the City of Edmonton's public reception area. The double height lobby space visually connects these two circulation paths and encourages navigating between each of the spaces. Due to its magnitude, the lobby becomes multi-functional public space with the ability to host a multitude of events from public engagement sessions to art displays. The boundary between the urban sidewalk and the public lobby is further eroded through the continuation of paving patterning and tones through to the lobby floor finishing.

The City of Edmonton is promoting a Green Building Audio Tour in order to raise awareness about the sustainable design and construction aspects in the buildings. Through this initiative, the green building strategies implemented will be actively promoted providing Edmonton Tower the recognition it deserves.



Q.4 ENVIRONMENTAL BENEFITS

A reduced carbon footprint was a key goal of Edmonton Tower. Our project team emphasized sustainability throughout design and recently achieved LEED® Gold certification.

Together, Edmonton Tower's sustainable features can achieve 33 percent energy savings compared to the baseline. Our team worked to incorporate energy saving features including air-side heat recovery at each dedicated outdoor air system, water-side free cooling from cooling towers in winter operation, variable flow heat pumps with Electronically Commutated Motors (ECM) fan motors for podium retail tenants, and high-efficiency chillers. The project diverted 75 percent of construction and demolition waste from landfills and material used on the project was either recycled or reused. In addition, 35 percent potable water use reduction and 27 percent energy cost reduction.

The overall energy intensity target for Edmonton Tower is 110 kWh/m²/yr - 1/3 that of a typical Edmonton building.

Typically, towers are constructed using concrete instead of steel. While there are many benefits to using concrete as a primary material, it is not the optimum environmental choice. Steel, by contrast, is lighter and predominantly a recycled material composed of 80 to 90 percent recycled content.

Downtown parking constraints mean that user will travel to the project by public transit—both bus and LRT. Onsite parking is only available underground reducing the heat-island effects. This co-shared parking facility is reserved for office workers during the day and made available to Rogers Place event patrons in the evening effectively using the space and eliminating the need for additional parking facility construction.



Q.5 MEETING CLIENT'S NEEDS

ICE District Joint Venture expressed their desire for the creation of a tower like nothing the City had ever seen before. They wanted something innovative and distinct with the goal of changing Edmonton's skyline forever. To execute this lofty goal, the consulting teams were involved in coordination meetings, visioning sessions, and creative planning meetings from the beginning. All facets of design and engineering for Edmonton Tower were like a well-tuned symphony where everyone played their part to create a successful building.

Our project team aimed to exceed expectations of all project stakeholders. This meant considering the needs of client, the developer, the future tenants, and the citizens of the City of Edmonton. We also mitigated risks and challenges that our stakeholders had not anticipated which added value and delivered a successful project within the expedited timeline.

Corporate office spaces rely on engaging design to attract prospective tenants. Our design team was challenged to provide an innovative 'shell' and enticing public space that would support highly adaptable and open lease spaces. Since Edmonton Tower was the first private development constructed in ICE District, following the initiation of Rogers Place, it was important to establish a quality benchmark for the area. While being first out of the gate did come with learnings for all parties involved, solutions, standards, and approaches directly benefited and informed adjacent projects and their respective teams. Stantec utilized these lessons learned as an added check on future quality control and assurance processes for adjacent works within ICE District.





