



AUPE New Corporate Headquarters

Canadian Consulting Engineering Awards 2023

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Firm: MCW Group of Companies

Client/Owner: Alberta Union of Provincial Employees (AUPE)

Prime Consultant/Client: Next Architecture

Contractor: Bird Construction

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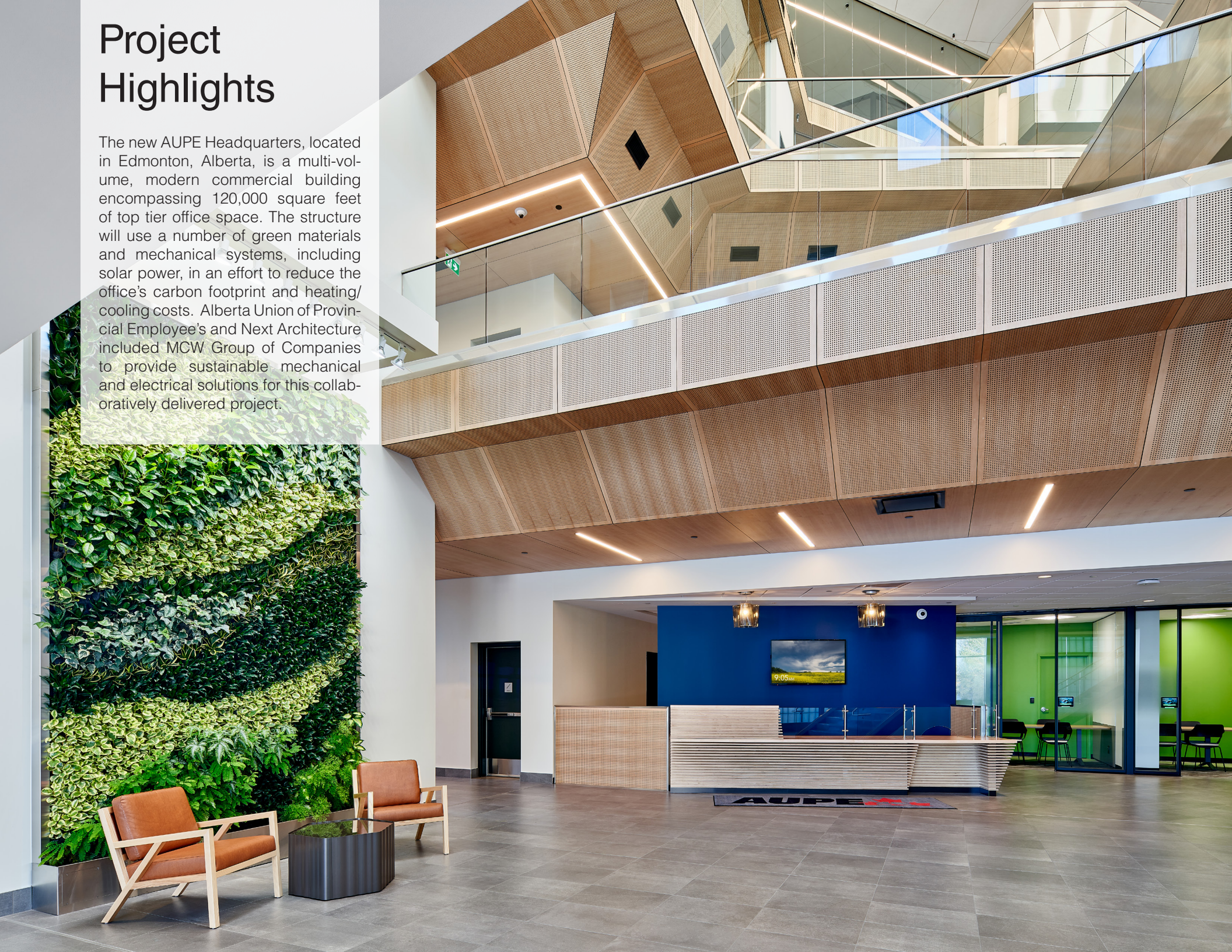
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Project Highlights

The new AUPE Headquarters, located in Edmonton, Alberta, is a multi-volume, modern commercial building encompassing 120,000 square feet of top tier office space. The structure will use a number of green materials and mechanical systems, including solar power, in an effort to reduce the office's carbon footprint and heating/cooling costs. Alberta Union of Provincial Employee's and Next Architecture included MCW Group of Companies to provide sustainable mechanical and electrical solutions for this collaboratively delivered project.



Project Innovation

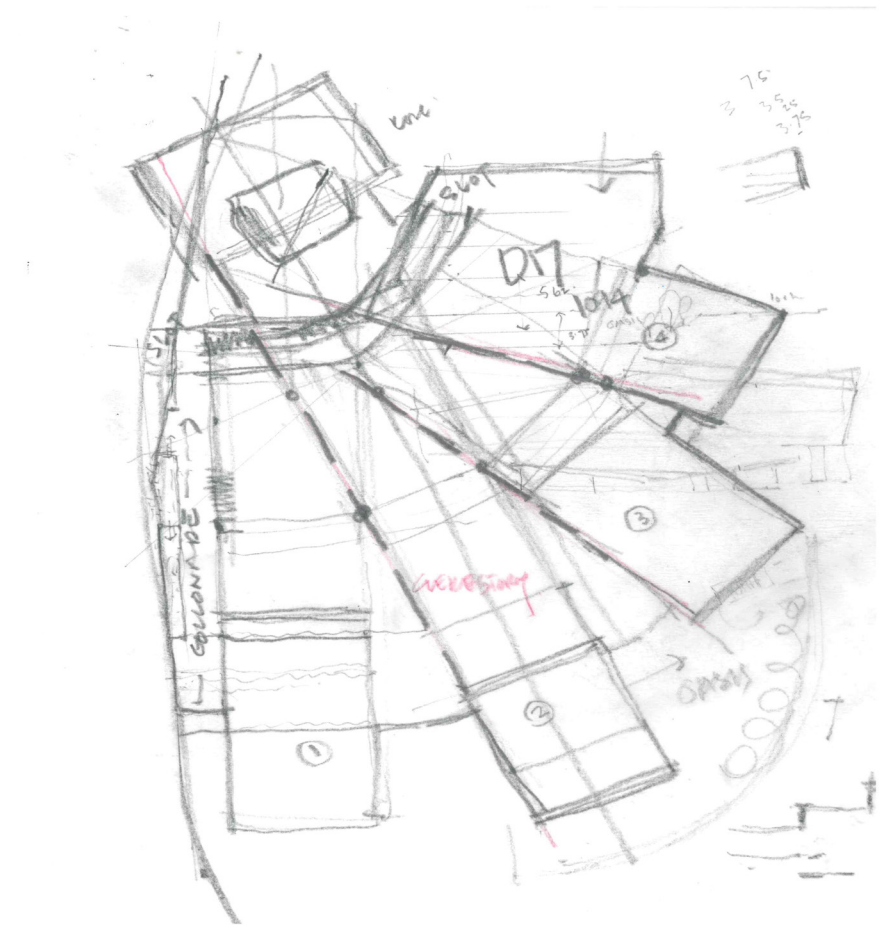
The new AUPE building challenges the perceptions of what an office space can be in today's world. The approach and methodology the team utilized during this project pushes boundaries on both innovation and sustainable design in the industry.

This project was built using a modified Design Build approach relying on use of Building Information Modelling (BIM) and a highly collaborative design and construction between all consultant teams. Using a live model environment in which all disciplines work in the same space means changes are quickly understood and challenges in coordination are more apparent throughout the design process. Our team additionally utilized strong VDC (Virtual Design and Construction), in order to plan on a site reflective of actual sizes, lengths, locations, and components.

The design concept of the building was largely possible because of the mechanical, electrical, and structural engineers were able to vet how building systems could be accommodated and enhanced for construction. The team interacted with energy modelers very closely especially during the formative stages of the facility design to assist in confirming the building shape, materials, and glazing ratios. As the building geometry evolved, aspects such as building envelope performance, amount of glazing to be incorporated, impact of building materials, and even the orientation of the building on the site were scrutinized. Energy Modelling greatly assisted confirming budget assumptions related to the proposed envelope and allowed for exploration of various options until the ideal scenario was confirmed.

The project additionally incorporated use of an expedited permitting process in which the project team worked closely with the City of Edmonton to essentially establish both Development and Building Permitting well ahead of typical submissions. This involved providing City Inspectors with details of the intended design covering key life safety systems and commentary on the other systems which were still in design. This process advanced both the design

design timeframe and construction significantly for a building of this size and complexity.

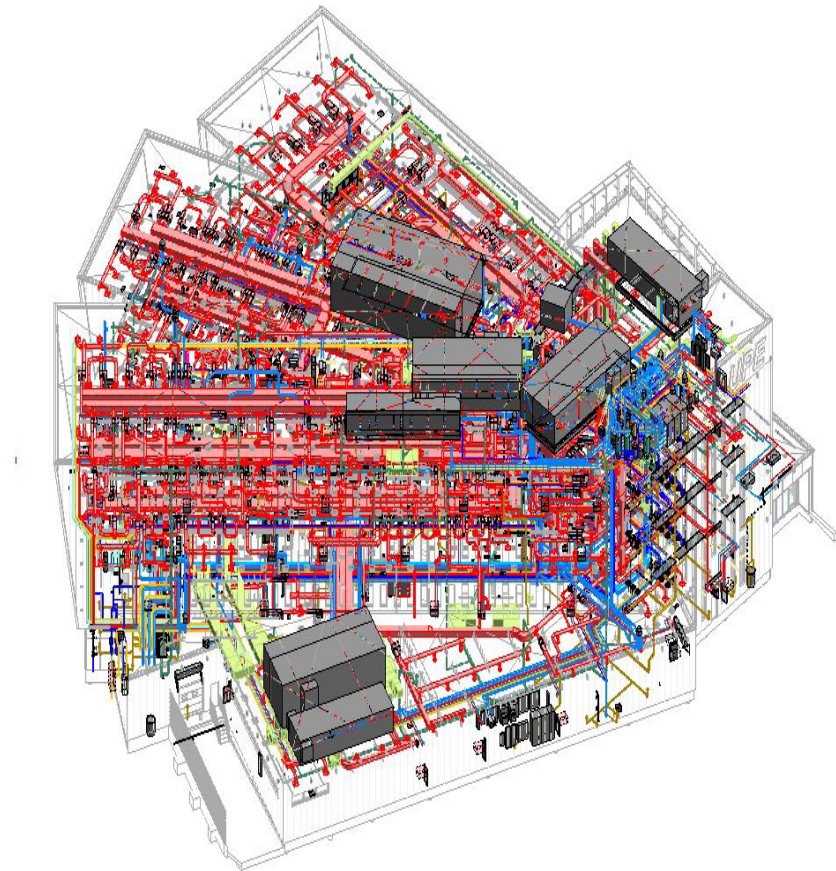


Complexity

The Mechanical systems for this project had a number of unique challenges that were a result of user needs and building geometry. Early design concepts and load calculations identified the need for five (5) roof top air handling units of various sizes supplying approximately 125,000 cfm. The unique building shape meant locating these large units and finding pathways to bring in major ductwork was no easy challenge.

The team determined the best layout was to locate two (2) air handling units on the first level and three (3) air handling units on the fifth level (roof of penthouse) using voids created by the architectural design to manage major ductwork to the various floors. This decision was locked down early in the design process which allowed other disciplines and contractors to move with certainty knowing the locations and sizes had been validated and agreed to.

The air handlers were designed to accept enhanced filtration methods should it be determined that outdoor ambient conditions such as pollution were impacting indoor air quality. A second unique strategy involved capturing waste heat and reusing it to the benefit of building operations. A heat exchanger was added on the condenser water loop to recover the waste heat for injection into the heating water loop which will be used in the reheat coils on the VAV air system. This concept will eliminate the need for the boilers burning natural gas in the summer time and reduce the energy and water usage in the cooling towers.





Social and Economic Benefits

For AUPE, constructing a new, multi-million dollar building comes with tremendous scrutiny from, and need for accountability to, a number of internal and external groups. A set of guiding principles were established and enthusiastically adopted by the design, engineering, and contractor teams to ensure AUPE's goals remained clearly in sight.

The five (5) principles were as follows:

- Solidarity and Mobilization
- Safe and Inclusive
- Progressive, Responsible, Innovation
- Invest in the future of our membership, our staff
- Adherence to fiscal and temporal responsibility

This focus allowed the team to challenge each other in how to evaluate unconventional concepts or ideas and fit them within a largely conventional framework. Overall, this did not mean things automatically became more expensive but instead meant more consideration for relationships between interconnecting systems had to be thought out and tested.

The idea of interconnecting systems came to light when the topic of incorporating enhanced smart building technology was introduced to the team. With this concept in place, Facility managers would be able to see all key building metrics to drive operational efficiency and improved user experience.

The intent of designing a new headquarters building for AUPE was to ensure the company was being energy efficient, but also having a healthy building for their team members to work in. The AUPE committee and entire design team advocated for the building to make impacts internally on users but additionally externally as well.

The AUPE is an organization that advocates for the health and wellness of employees in Alberta. Their efforts of creating a new headquarters was to ensure they have the appropriate working space that allows them to support the ongoing economy.





Environmental Benefits

While the new AUPE buildings was always intended to incorporate sustainable principles to meet requirements of LEED Silver, it was the introduction of the WELL Building Standard which was a game changer from a design and engineering perspective especially for mechanical and electrical infrastructure.

WELL is a concept in which not only the physical performance metrics of a building are considered but significant focus is paid to behaviors of people within the buildings and how a healthier environment for building users can be achieved. The basics of WELL focus on the following – air, water, nourishment, light, fitness, comfort, and innovation. There were a number of design measures our Mechanical and Electrical teams took to focus on these elements:

- Utilize energy modelers very closely especially during the formative stages of design to provide necessary validation on building performance
- Designed air handlers in building ventilation systems that can react to elevated CO2 readings in certain areas
- Added a heat exchanger in building operations to capture waste heat and reuse it, reducing energy and water usage in cooling towers
- Use LED chipset to measure lighting wave length in order to enhance productivity and comfort for building occupants, accounting for the electronic devices they use

The AUPE Headquarters is one of 10 projects in Alberta currently registered with the intention of achieving WELL Certification. With the collaborative environment and attitude established, the inclusion of WELL became a welcomed challenge to the project team.





Meeting the Client's Needs

The AUPE's vision for their new headquarters was a place of safety, confidentiality, and one that was representative of their organizational values. In order to create a space that was inviting to their members, our team worked to incorporate different design elements that could enhance the user experience.

The overall design approach deliberately focused on creating open corridors, natural light, open ceilings, and areas catering to a wide variety of uses and users. As part of the considerations relating to the WELL program, glare from light fixtures was scrutinized in an effort to reduce eye strain and sub optimal conditions for those using the space. Creating optimal lighting conditions requires specifying fixtures which offer an appropriate glare level when combined with ambient light levels from the sun throughout the day.

Therefore, the modular nature of the design creates pockets in which natural light is brought into the building through voids which create the pathways for light without sacrificing valuable floor space or usable areas. This consideration focuses on providing proper, and comfortable lighting levels for building occupants and accounting for electronic devices which they use. It additionally keeps in mind the client's vision for a more calming environment.

Inside, the AUPE is airy and bright with its asymmetrical footprint creating irregular, yet efficient spaces. Natural light was a major factor in the design, with the addition of ample windows and skylights to help bring the outdoors in.



