

## A BREATHING FAÇADE – MACKIMMIE TOWER IN CANADA WITH POWERFUL DOUBLIN-SKIN FACADE BASED ON HUECK TRIGON UNIT L

The redevelopment of the MacKimmie Tower at the University of Calgary in Canada has produced one of the most sustainable buildings certified by the Canada Green Building Council (CaGBC). Designed by the Canadian architectural firm DIALOG, the complex reawakens with a double-skinned 'breathing' façade that allows highly performant energy efficiency, continuous air ventilation and quality of interior lighting. Ferguson Corporation implemented these aluminium façades using profile systems by the German aluminium systems house Hueck. These were based on the Hueck Trigon Unit L element façade with integrated Hueck Lambda WS 075 windows.



Figure 1: Concealed motors facilitate the automatic opening and closing of the windows, which are operated by the Building Management System, while retaining the harmonious look of the façade. (source: Hueck)



## Exemplary restructuring process

Because of its environmental impact, a complete demolition of the Mac Kimmie Complex at the heart of the campus of the University of Calgary had never been an option, explains John Souleles, principle architect at DIALOG. Approximately 2.800 tons of CO2 emissions were avoided by stripping down the 16-storey MacKimmie Tower to its concrete core. The remaining core was then extended by two storeys and upgraded with a new interior and exterior look. The concrete, steel and glass that were removed during the demolition process were recycled. Additionally, the tower's redevelopment incorporated energy-saving measures, such as highly efficient double-skin façade, photovoltaics and natural ventilation.

"Based on the ethics of the University of Calgary and its associated office of sustainability one of the primary drivers of the project is environmental consciousness," Souleles explains. Druh Farrell, City of Calgary Councillor states: "The new MacKimmie Complex will stand as a daily and practical inspiration for students to focus more on sustainability. It is already helping to diversify our building industry by bringing new technologies, materials, and techniques to Calgary."

## Inspiring façade design

Highlight of this complex project is the tower's smoothly curved and automated double skinned façade consisting of unique glass panels that are wrapped diagonally in one continuous line across its exterior surface.

The goal of the architects was to create a dynamic 'breathing' façade that adapts to the natural wind, sun and soil. Therefore, installed sensors and building automation systems respond to weather changes and automatically open and close the windows to minimize energy use and optimize the internal temperature, daylight and air quality.



Figure 2: The MacKimmie Tower reawakens with a double-skinned 'breathing' façade that allows highly performant energy efficiency, continuous air ventilation and quality of interior lighting. (source: Hueck)



Figure 3: The active shading system within the double-skin facade and the building-integrated renewable energy generation contributed to the MacKimmie Tower's green building standard recognized by the Canadian Green Building Council (source: Hueck)

## Refined facade solutions

The metal construction company Ferguson Corporation implemented the exterior curtainwall using a special solution based on the Hueck Trigon Unit L element façade with integrated outwards opening windows of the Hueck Lambda WS 075 OU series. The unitized structural glazing façade was tailor-made, as its unique parallelogram-like units require a special fitting. In addition to that, concealed motors facilitate the automatic opening and closing of the windows, which are operated by the Building Management System (BMS), while retaining the harmonious look of the façade.

These motors were specifically adapted to and certified for the American and Canadian market. While the exterior curtainwall contains a triple-glazed system for maximum daylight and thermal performance, the interior curtainwall embodies 13 mm thick laminated glass panes. Furthermore, Ferguson implemented the Hueck Lambda WS 075 aluminium windows with a tailor-made sash combination - using one sash in another - for optimized ventilation and maintenance. Deployable shading systems for sunlight and visual privacy were installed between the two façades to control the degree of lighting and maximize the wellbeing of the occupants.

## Excellent construction project

Since the redevelopment of the MacKimmie Complex, the tower has received multiple awards and a certification for its advanced methods using weather conditions to create sustainability. As such, it was awarded the 2020 Zero Carbon Green Building Excellence Award by the Canada Green Building Council (CaGBC).

During the entire development process, the reconstruction of the MacKimmie Tower was designed along the certification guidelines of the Zero Carbon Building Standard, the Canadian measure of green building innovation. "The double-skin façade with active shading systems and building-integrated renewable energy generation, along with other advanced features, will have a transformative effect on the campus, and other post-secondary institutions in Canada", says Thomas Mueller, president and CEO of the CaGBC, which issued the Zero Carbon Green Building Excellence Award to the MacKimmie Tower. Additionally, the complex was awarded the Targeting LEED Platinum certification for Building Design and Construction. With its platinum certification, the MacKimmie Tower received the highest possible ranking for sustainable construction and buildings.

## Sustainable lighthouse project

"The unique double-skin façade of the MacKimmie Tower does not only convince through its extraordinary and distinctive shape and design, but also serves as a lighthouse project for sustainably oriented buildings to come. We are very proud to have been part of this fascinating project", proudly resumes Olaf Müller, International Sales Director at Hueck.

The complete object report on the MacKimmie Tower:

[https://hueck.blaetterkatalog.de/app\\_documents/?catalog=Objektbericht\\_MacKimmie\\_EN&lang=en\\_GB](https://hueck.blaetterkatalog.de/app_documents/?catalog=Objektbericht_MacKimmie_EN&lang=en_GB)