OPA ZBA Waterloo

13 Sep 2024

Rita Szilock,
Senior Development Planner
Integrated Planning & Public Works
City of Waterloo
100 Regina St. S | PO Box 337, Stn Waterloo
Waterloo ON N2J 4A8

Applicant: Trevor Hawkins
MHBC Planning, Urban Design & Landscape Architecture
540 Bingemans Centre Drive, Suite 200
Kitchener ON N2B 3X9

Re: Official Plan Amendment, Zoning By-law Amendment - 1 Columbia St W

Dear Rita,

This shadow impact analysis has been prepared by Studio Limina Inc., on behalf of Centurion Asset Management Inc., for 1 Columbia Street West in Waterloo (the site), as a complete application requirement in support of an Official Plan Amendment and Zoning By-law Amendment.

The shadow impact diagrams are established on the 3D model prepared by Studio Limina Inc., using software of Revit and Enscape, with geolocation and topographic information from the survey prepared by MTE consultants of the property, and for the surroundings, from Open Streetmap. Given the known inaccuracies in the topographic information from Open Streetmap, it is noteworthy to mention that any measurements of the surroundings of the site contained herein may not be entirely accurate.

Evaluation Criteria

The City has established guidelines and criteria for Sun / Shadow Analysis in Terms of Reference (TOR) updated on June 30, 2023. The study evaluates the shadow impact that the proposed development will have on the site and surrounding sidewalk with emphasis on residential uses, outdoor amenity spaces and park spaces. To be considered compatible, the TOR requires demonstration of the three-hour continuity principle for residential yard:

- Residential Yards: Minimum 3 continuous hours of sun during the March and September test dates.
- Public Sidewalks: Minimum 50 percent sun coverage on the opposite sidewalk between 9 AM and 6 PM during the March and September test dates.

Shadow Impacts

The proposed development for 1 Columbia Street West consists of a 7-storey midrise student residence and a 1-storey café. There is an existing 22-storey residential tower containing a 3-storey parking structure along Columbia Street West. The proposed courtyard between the existing tower and the proposed midrise student residence is designated as outdoor amenity space. The following includes assessments of the shadow cast by the proposed development and existing tower to the surrounding sidewalk and outdoor amenity space, with detailed diagrams of each test date and time required by TOR.

March 21st (Sunrise 7.24AM – Sunset 7.35PM)

On the March 21st Equinox, the three-hour continuity principle is satisfied for the courtyard – outdoor amenity space. The courtyard area is in sun for a continuous 4 hours from 2PM to 6PM. As such, it does meet the criteria.

The opposite sidewalk on King Street North is not impacted by the shadow cast by the proposed 7-storey midrise from 8AM to 2 PM, and there is more than 50% sun coverage at 3PM. From 4PM to 6PM, the shadow produced by the proposed midrise only covers 26%-34.5% of the opposite sidewalk. However, the aggregated shadow will be more than 50% if the existing 22-storey building is taken into consideration. Even though the proposed student residence height is only 26m, while the zoning by-law permits 82.5m, it is difficult to meet the shadow criteria.

The proposed midrise has no impact on the opposite sidewalk on Columbia Street West on March 21st.

June 21st (Sunrise 5.41AM – Sunset 9.07PM)

On the June 21st Solstice, shadows cast by the buildings are smaller due to the height of the sun. The courtyard has sun coverage of a continuous 8 hours from 8AM to 4PM. Therefore,

the development meets the shadow criteria for June.

As the shadow moves across the site, the sidewalk is free from impact by the proposed midrise until 4PM. The shadow produced by the proposed midrise covers 15% -26% of the sidewalk area from 4PM to 6PM. Yet again, if we consider the shadow of the existing 22-storey building, the combined shadow will be more than 50% from 4PM to 6PM. The shadow criteria are not met for the public sidewalk due to the reasons described above.

The proposed midrise has no impact on the opposite sidewalk on Columbia Street West on June 21st.

September 21st (Sunrise 7.08AM – Sunset 7.22PM)

Similar to the shadows pattern in March, the sun is lower than it is in June throughout the day. The courtyard is in the sun from 2PM to 6PM. Hence, the development meets the shadow criteria for September.

The shadows cast on King Street sidewalk are similar to March as well, with no impact by proposed midrise until 3PM. Then 25.6%-35.2% of sidewalk area is covered by its shadow. Once again, the aggregated shadow area is more than 50% from 3PM to 6PM if we consider the existing building, which does not meet the shadow criteria. The proposed midrise has no impact on the opposite sidewalk on Columbia Street West on September 21st.

December 21st (Sunrise 7.52AM – Sunset 4.49PM)

Not required for residential yard and public sidewalk.

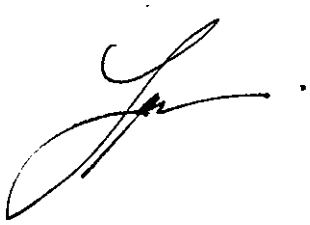
Conclusion

The shadow impacts of the proposed development building on the opposite sidewalks are minimal, from 15%-35.2% throughout the year, compared to the impact of the surrounding existing buildings. The proposed courtyard on the subject property will serve many functions throughout the year, providing green space, access through the site, café seating space, study areas, performance seating area and social seating. In addition, with visual access to the space from both the existing and proposed buildings, the courtyard will serve to provide visual enhancement to both buildings, introducing natural light – both direct and

reflected, and nature. These functions will be improved with direct sunlight but will remain effective and critical in providing wellbeing and connections to nature.

Based on the foregoing, The extent of shadow impacts associated with the Proposed Development are suitable in this urban context.

Sincerely,



Lance Kaprielian, Principal