SHADOW STUDY

MODERN REAL ESTATE DEVELOPMENTS

PROPOSED MIXED USE DEVELOPMENT

87-95 SEAGRAM DRIVE, WATERLOO, ON

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TABLE OF CONTENTS

TABLE OF CONTENTS 0
1. Scope & Study Criteria 1
2. Proposed Development 2
3. Neighbouring Buildings 3
4. Findings 4
4.1 Spring 4
4.2 Summer 4
4.3 Fall 4
4.4 Winter 4
5. Conclusion 4
6. Spring Shadow Diagrams 6
7. Summer Shadow Diagrams 8
8. Fall Shadow Diagrams 10
9. Winter Shadow Diagrams 12

1. SCOPE & STUDY CRITERIA

This shadow study has been prepared by Masri O Inc. Architects as a part of an application for Zoning Bylaw Amendment and Official Plan Amendment that is submitted to the City of Waterloo Planning Department in support of the re-development of five consolidated lots 87-95 Seagram Drive in Waterloo (Site).

The study is based on computer modeling of the shadows and their impact on surrounding areas around the proposed development. The shadow study has been prepared using a digital three-dimensional model that represents the proposed building per the design proposal. The model is geo-located to its precise location to provide an accurate representation of the shadowing that would occur on Site.

The analysis demonstrates shadowing in the spring (March 21), summer (June 21), fall (September 21), and winter (December 21), at one-hour time increments. The hourly intervals for June are 8:00 A.M. until 8:00 P.M. The hourly intervals for March/September are 8:00 A.M. until 7:00 P.M. The hourly intervals for December are 9:00 A.M. until 7:00 P.M. For the winter diagrams, we note that the shadowing effect for the later hours is simulated, but would not be perceived as sunset is expected to take place as early as 4:49 P.M. in the winter months.

2. PROPOSED DEVELOPMENT

The proposed development at the Site is a 33-storey mixed-use building consisting a podium and two separate towers. The podium has 1 floor of commercial at the ground, and 6 floors of residential apartments complete with amenity space, bike parking and auxiliary spaces. The Towers that sit atop the podium are each 27 storeys. Tower 1 has 1 floor of amenity space at the podium rooftop level, 24 floors of residential apartments and 2 floors of office space at the 33rd and 34th floors. Tower 2 has 1 floor of amenity space at the podium rooftop level and 26 floors of residential apartments.

The property fronts along the south side of Seagram Drive close to University of Waterloo, Wilfred Laurier University and Waterloo Park. The neighbouring buildings contain a mix of uses and building typologies including recreational buildings and residential buildings. The size and height of surrounding buildings varies from large 1 storey recreational buildings, to small 2-storey dwellings and mid-and-high-rise residential and mixed-use buildings.

3. NEIGHBOURING BUILDINGS

Neighbouring buildings include:

South:	University Stadium
West:	Rotary Club/KW Granite Club, Waterloo Park
North:	160 Lester St (4 storey Residence Building – Waterloo College Hall)
	181 Lester St (17 storey apartment building)
	96 Seagram Dr (2 storey house/apartments)
East:	85 Seagram Dr (6 storey apartment building)

Other surrounding buildings extending to the north are a mix of high-rise apartments and low-rise residential dwellings. Farther to the south and west is Waterloo Park. Farther to the east are mostly low-rise residential dwellings.

The neighbourhood context map shown in figure 1 below highlights the site in red.



Figure 1 - Neighbourhood Surrounding New Development

4. FINDINGS

The shadow impact is modelled based on 1-hour intervals and results are summarised below seasonally.

4.1 SPRING

As illustrated in the diagrams depicting shadows generated by the proposed building on March 21 (figures 2-13), the impact on the neighbouring North, West, and South properties is not significant in the spring. Despite shadows being long in the spring due to the low angle of the sun, generally the sun moves quickly throughout the day along its short path.

Due to the lower sun angle, especially in the evening, the modeling shows the shadows cast onto properties to the east of the proposed development to be longer before 9:00am and after 6:00pm. However, evening shadows are not considered significant since sun set at this time of year is around 7:30pm.

4.2 SUMMER

The diagrams depicting shadows generated by the proposed building on June 21 (figures 14-25), show the shadows in the summer months as shallower and moving slower over the land, due to the high altitude of the sun. As such, shadows are shorter and have the least impact during the summer months.

At any time during the day in the summer, the shadows do not cover any single property fully, nor for more than a single time interval.

4.3 FALL

As represented by the modeling for September 21 (figures 26-37), the proposed building generates shadows that are marginally more pronounced in the Fall as compared to the Summer – especially during the evening hours – due to the low angle of the sun. However, the shadows cast in the Fall are virtually identical to those cast in the Spring with the sun path being short.

Due to the lower sun angle, especially in the evening, shadows cast onto buildings to the east of the proposed development appear longer before 9:00am and after 6:00pm. However, the late afternoon-early evening shadow is of minor significance since sunset at this time of year is around 7:30p.m.

4.4 WINTER

Due to the low angle of the sun in winter, the diagrams depicting shadows generated by the proposed building on December 21 (figures 38-47), cast shadows throughout the day. However, due to the path of the sun being the shortest of the year during winter months, the shadows move quickly across the adjacent properties.

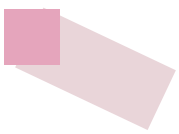
Shadow effects are observed all day, over much of the surrounding area to the north of the proposed development. Since the property is on the South side of Seagram Drive, the street helps to mitigate the effect on neighbouring properties. Generally, properties to the north of the proposed building experience shadows for less than a single interval. To the north, there are existing tall buildings that already generate some shadowing on their surroundings.

Spring and fall shadows cast by the proposed building appear long during the late morning and early afternoon hours, affecting the properties across the street, along the north, west, and east of the Site. However, these properties are not shadowed by more than 50% or for more than four, 1-hour intervals (4hrs), and they continue to receive full sun outside the timeframe mentioned. Shadows in the spring and fall after 6:00 pm appear dramatic in the modeling due to the low sun angle, but pose no tangible concern due to the time of day.

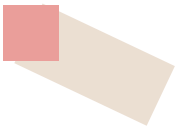
Shadow effects in the winter appear significant at any given time but move quickly across the affected properties which are not exposed to shadowing for more than a single interval.

Despite the height of the building of 33 storeys, the shadows cast onto the neighbouring properties are not considered significant or detrimental. The proposed development consistent of two towers assists in the structure having a smaller footprint – in other words – the point towers contribute less shadowing effect than a slab tower would.

In summary, the findings of the Shadow Modeling indicate that the shadows generated by the proposed development will not shade 50% or more of neighbouring properties for more than four interval times (a four-hour equivalency); and that at least 50% of any property is in full sun for at least four interval times (a four-hour equivalency). No mitigative measures are recommended.

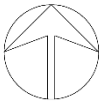


Proposed Development



Future Development

Existing Building



Latitude N 43.46 43º
Longitude W 80.5204º

5. SPRING SHADOW DIAGRAMS



Figure 2 - March 21 @ 8:00 am



Figure 3 - March 21 @ 9:00 am



Figure 4 - March 21 @ 10:00 am



Figure 5 - March 21 @ 11:00 am



Figure 6 - March 21 @ 12:00 am

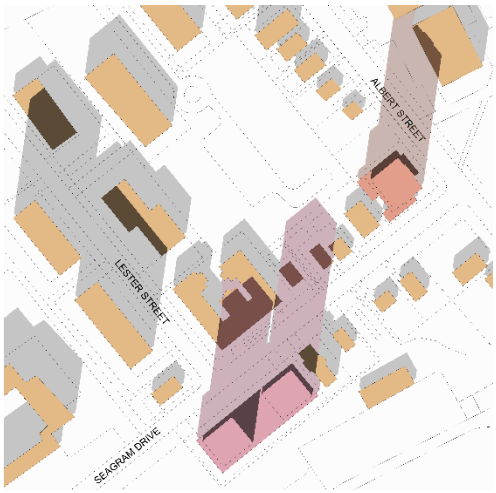


Figure 7 - March 21 @ 1:00 pm



Figure 8 - March 21 @ 2:00 pm



Figure 9 - March 21 @ 3:00 pm



Figure 10 - March 21 @ 4:00 pm



Figure 11 - March 21 @ 5:00 pm

6. SUMMER SHADOW DIAGRAMS



Figure 14 - June 21 @ 8:00 am



Figure 15 - June 21 @ 9:00 am

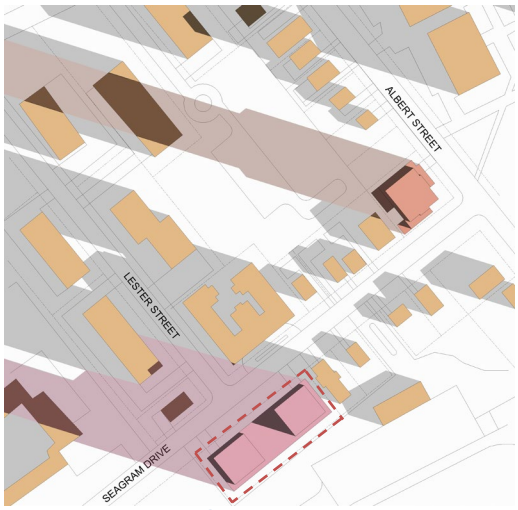


Figure 16 - June 21 @ 10:00 am



Figure 17 - June 21 @ 11:00 am





Figure 18 - June 21 @ 12:00 pm



Figure 19 - June 21 @ 1:00 pm

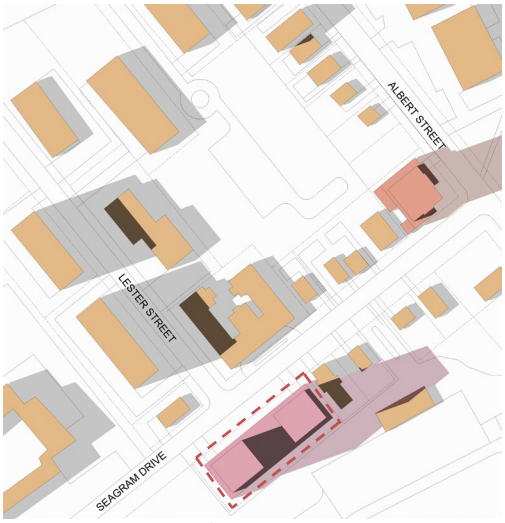


Figure 20 - June 21 @ 2:00 pm



Figure 21 - June 21 @ 3:00 pm



Figure 20 - June 21 @ 4:00 pm



Figure 21 - June 21 @ 5:00 pm

Figure 22 - June 21 @ 6:00 pm

7. FALL SHADOW DIAGRAMS



Figure 28 - September 21 @ 8:00 am



Figure 29 - September 21 @ 9:00 am



Figure 28 - September 21 @ 10:00 am



Figure 29 - September 21 @ 11:00 am





Figure 30 - September 21 @ 12:00 am



Figure 31 - September 21 @ 1:00 pm



Figure 32 - September 21 @ 2:00 pm



Figure 33 - September 21 @ 3:00 pm



Figure 34 - September 21 @ 4:00 pm

Figure 35 - September 21 @ 5:00 pm

8. WINTER SHADOW DIAGRAMS



Figure 38 - December 21 @ 9:00 am



Figure 39 - December 21 @ 10:00 am

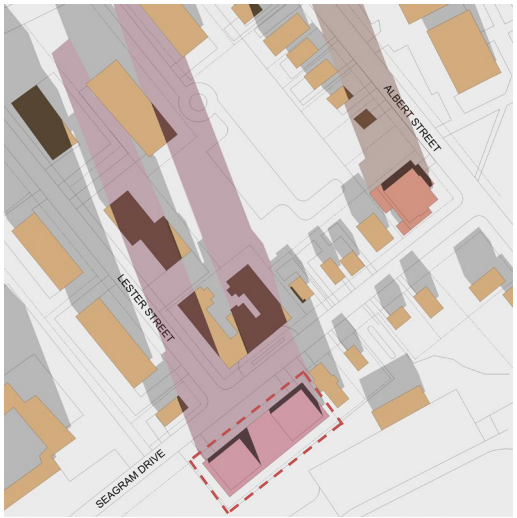


Figure 40 - December 21 @ 11:00 am

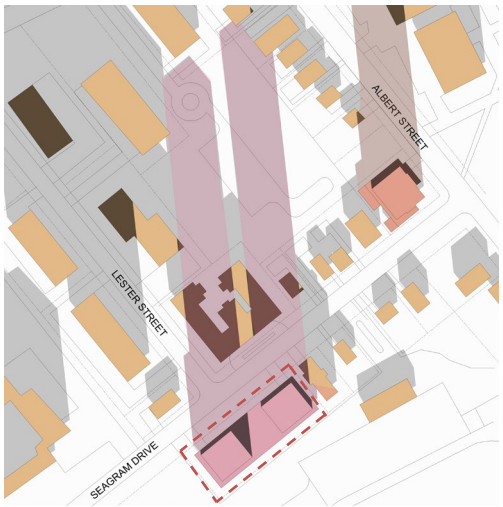


Figure 41 - December 21 @ 12:00 pm

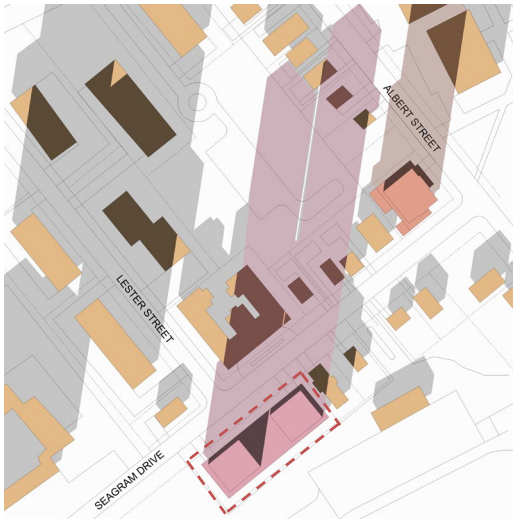


Figure 42 - December 21 @ 1:00 pm



Figure 43 - December 21 @ 2:00 pm

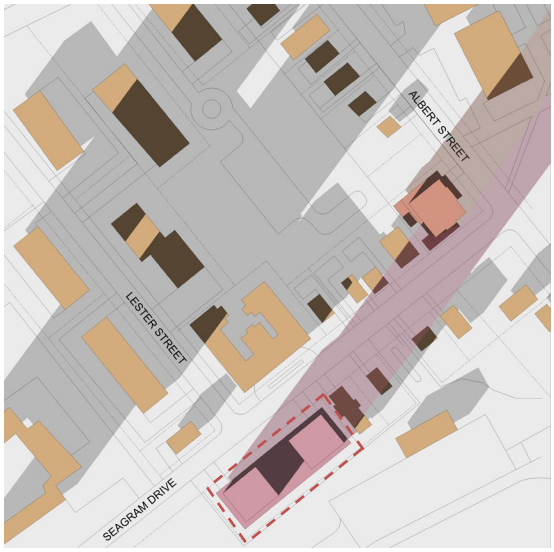


Figure 44 - December 21 @ 3:00 pm



Figure 45 - December 21 @ 4:00 pm

Proposed Development

Future Development

Existing Building

Latitude N 43.46 43°
Longitude W 80.5204°