WALTERFEDY

SHADOW STUDY ANALYSIS

177 and 179 Albert Street
Residential Development
Project No.: 2022-0040-10 November 16, 2023

1. SCOPE

This report is a description of the shadow study analysis that was completed for 177 and 179 Albert Street, Residential Development. The purpose of this study is to investigate the impact of the shadows cast by this building onto surrounding sites.

2. PROPOSED BUILDING

The proposed development is a 24 storey multi-unit residential building. The building is located on two merged lots: 177 and 179 Albert Street. The site is zoned RMU-81.

3. SURROUNDING CONTEXT

The existing context of the site is a combination of single detached houses, university buildings, and 6-12 storey multi-unit residential buildings, with a couple of 24-26 storey mixed use residential buildings northwest and southwest of the site along Albert Street and Lester Street, respectively.

4. STUDY CRITERIA

As per the City of Waterloo's Terms of Reference: Sun/Shadow Analysis and Urban Design Manual, shadow analysis was conducted for the following dates and times:

- **Spring - March 21 (Equinox)**: 8:00am, 9:00am, 10:00am, 11:00am, 12:00pm, 1:00pm, 2:00pm, 3:00pm. 4:00pm, 5:00pm, 6:00pm, 7:00pm
- **Summer - June 21 (Solstice)**: 8:00am, 9:00am, 10:00am, 11:00am, 12:00pm, 1:00pm, 2:00pm, 3:00pm. 4:00pm, 5:00pm, 6:00pm, 7:00pm, 8:00pm
- **Fall - September 21 (Equinox)**: 8:00am, 9:00am, 10:00am, 11:00am, 12:00pm, 1:00pm, 2:00pm, 3:00pm. 4:00pm, 5:00pm, 6:00pm, 7:00pm
- **Winter - December 21 (Solstice)**: 9:00am, 10:00am, 11:00am, 12:00pm, 1:00pm, 2:00pm, 3:00pm. 4:00pm, 5:00pm, 6:00pm, 7:00 pm

5. ANALYSIS

5.1 SPRING

In the spring, the morning shadows are mostly cast behind the site on properties with limited buildings/structures. During the 11:00am interval, the building will briefly shade the residential yards of the neighbouring properties to the north. The strength of the sun in the evening will be limited and will set fast, as observed from 4:00pm onwards, causing the shadows to be long and stretch onto neighboring properties for short duration.

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The sidewalks opposite the site, to the east, remain mostly in sun throughout the day due to the narrow massing of the tower. The narrow adjacent property, to the north of the site, remains mostly in the shadow of the building during the morning until mid-afternoon.

5.2 SUMMER

The shadows in the summer are shorter and shade the adjacent properties on the north and west for brief intervals during the morning. In the afternoon, the shadows are mostly positioned over the roadway or on the site itself. The shadows begin to stretch into adjacent sites to the east and south around 4:00 pm.

5.3 FALL

In the fall, the morning shadows are mostly cast behind the site on unbuilt land. During the 10:00am interval, the building will briefly shade the residential yards of the neighbouring properties to the north. The strength of the sun in the evening will be limited and will set fast, as observed from 4:00pm onwards, causing the shadows to be long and stretch onto neighboring properties for short duration. The sidewalks opposite the site, to the east, remain mostly in sun throughout the day due to the narrow massing of the tower. The narrow adjacent property, to the north of the site, remains mostly in the shadow of the building during the morning until mid-afternoon.

5.4 WINTER

During winter, the building casts longer shadows onto neighboring properties due to the low sun angle. During the 9:00am and 10:00am intervals the building shades the residential yards of the neighbouring properties to the north. However, by 11:00am, most of the properties, to the north of the site, are exposed to the sun. The shadows begin to stretch into neighbouring properties to the east and south around 12:00 pm.

6. CONCLUSION

- The findings of this study demonstrate the value in the Urban Design Manual is achieved for all properties within our site context apart from 181 Albert Street, the adjacent property to the north of the site:
    - At least 50% or more of any property should not be shaded for more than two interval times (a four-hour equivalency); or,
    - As a principle, at least 50% of any property should be in full sun for at least two interval times (a four-hour equivalency).

- The following values from the Term of Reference: Sun/Shadow Analysis are also achieved:
    - Public Plazas, Parks, and Open Space: no new net shadow between 10AM and 4PM during the September test date.
    - Public Sidewalks: Minimum 50 percent sun coverage on the opposite sidewalk between 9 AM and 6 PM during the March and September test dates.
    - Residential Yards: Minimum 3 continuous hours of sun during the March and September test dates.

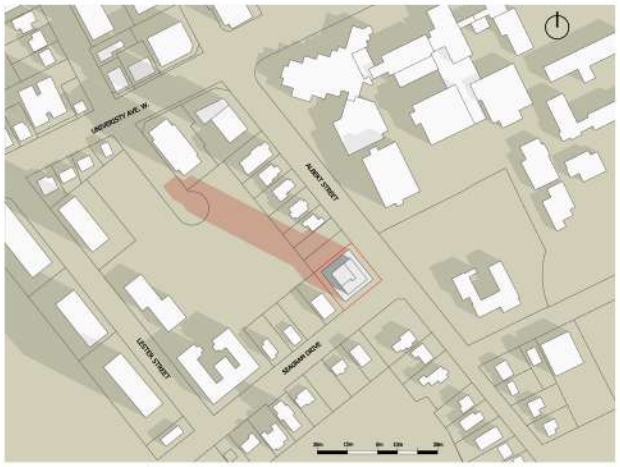
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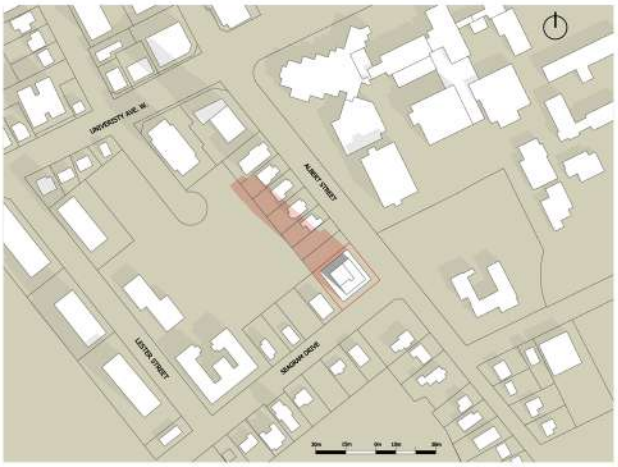
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9:00 am



10:00 am



11:00 am



12:00 pm



1:00 pm

SPRING: MARCH 21



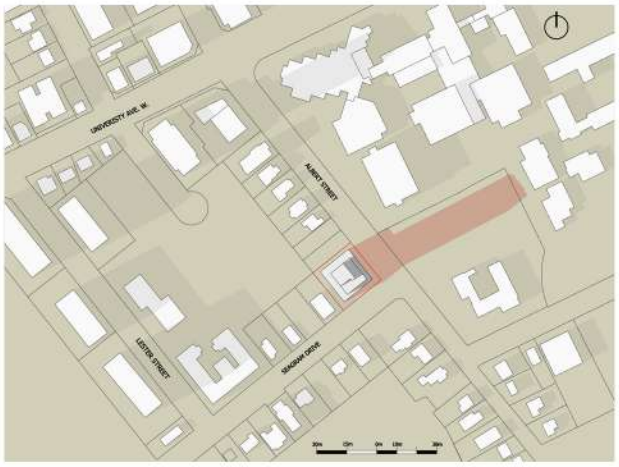
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3:00 pm



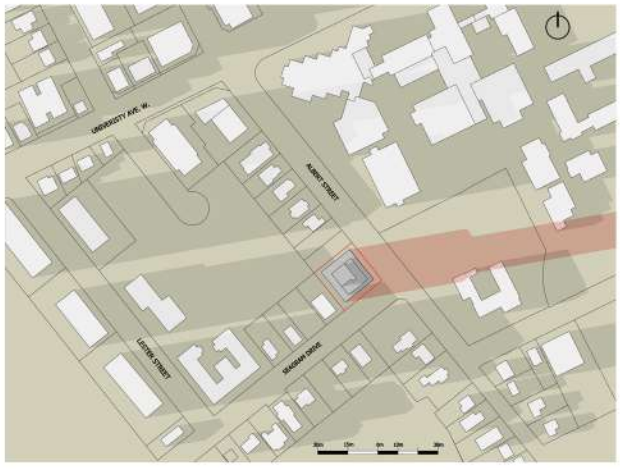
4:00 pm



5:00 pm



6:00 pm

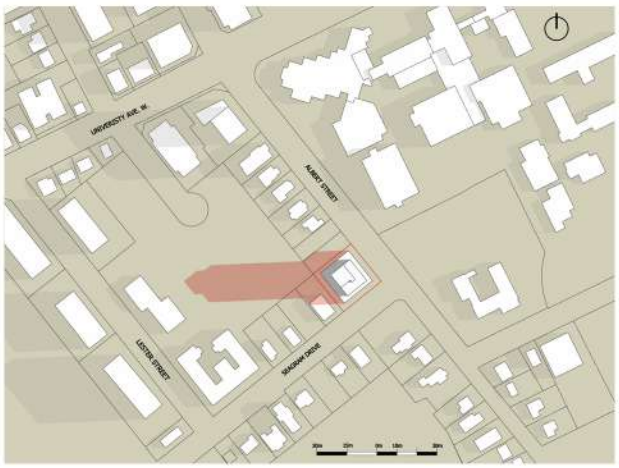


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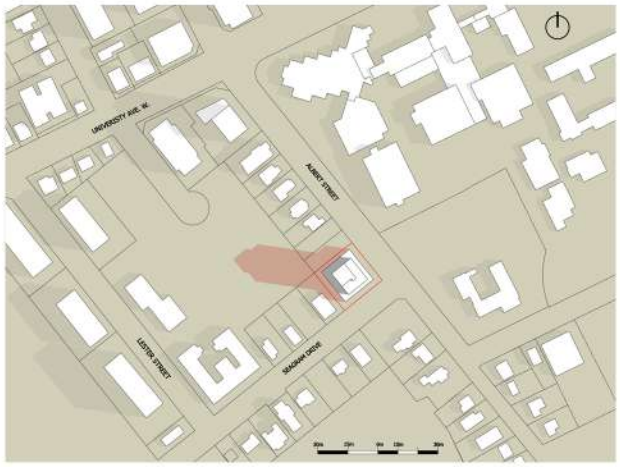
SUMMER: JUNE 21



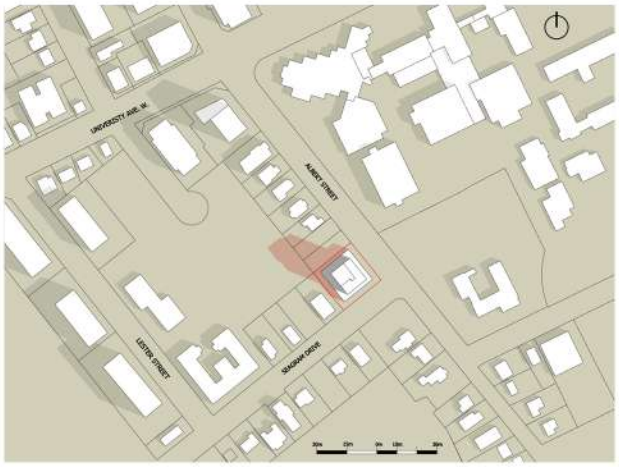
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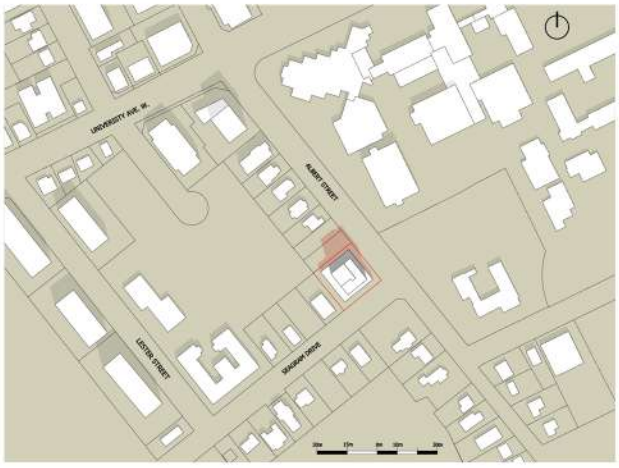
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11:00 am



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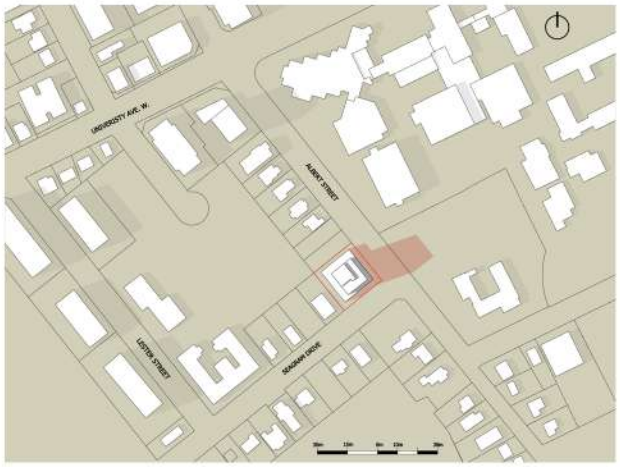
SUMMER: JUNE 21



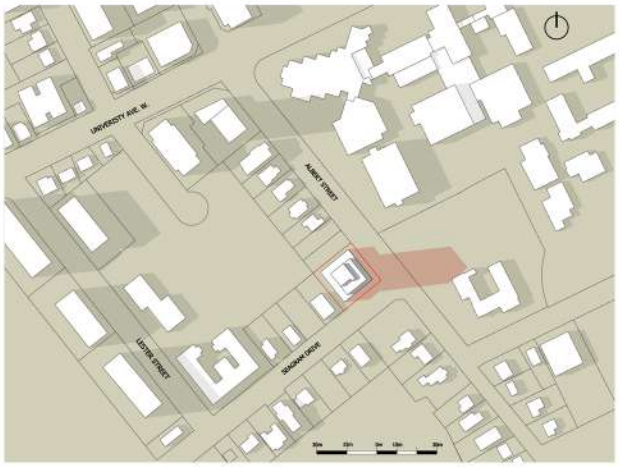
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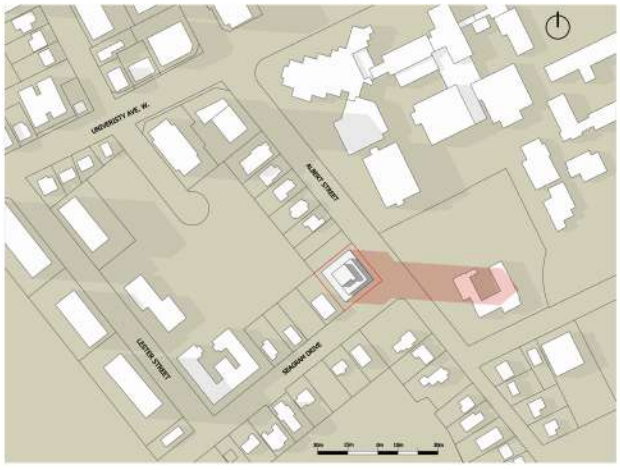
3:00 pm



4:00 pm



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6:00 pm



7:00 pm

SUMMER: JUNE 21



8:00 pm

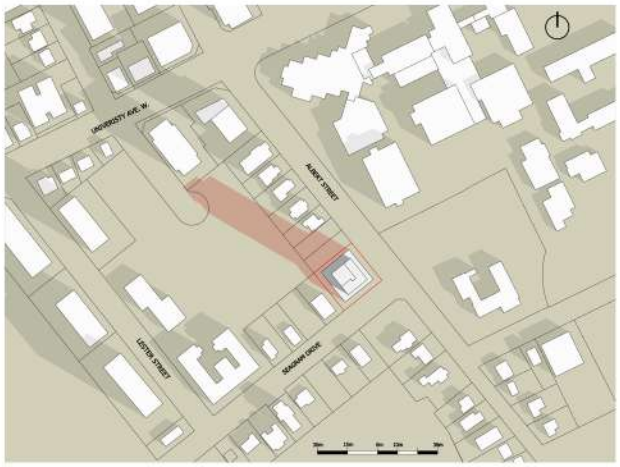
FALL: SEPTEMBER 21



8:00 am



9:00 am



10:00 am



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12:00 pm



1:00 pm

FALL: SEPTEMBER 21



2:00 pm



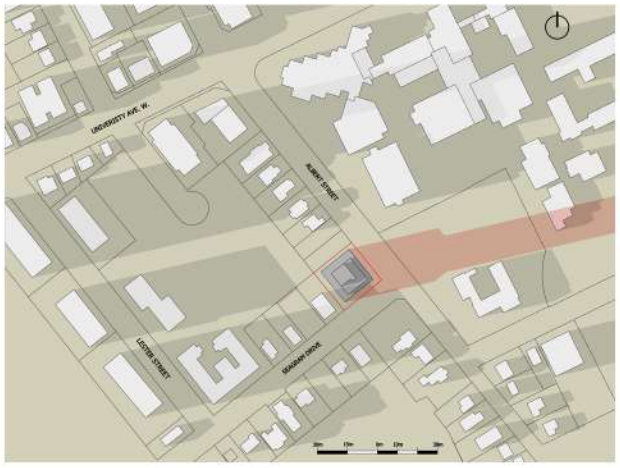
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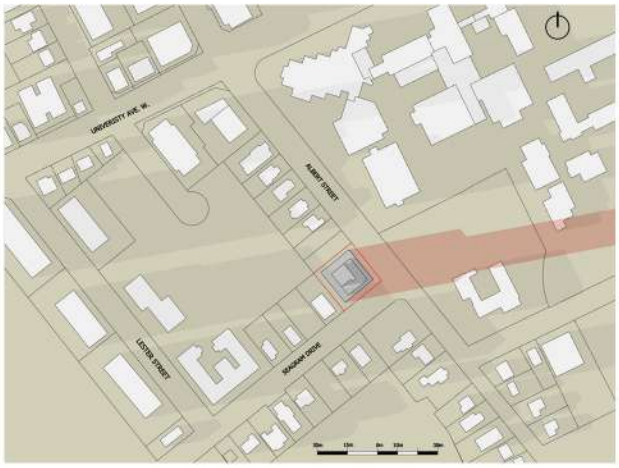
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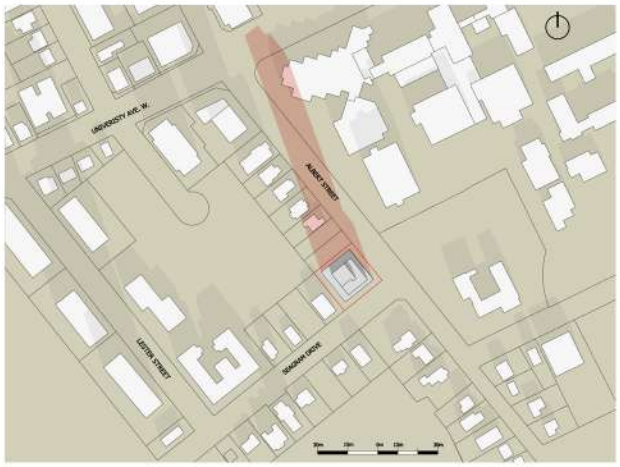
WINTER: DECEMBER 21



9:00 am



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11:00 am



12:00 pm



1:00 pm



2:00 pm

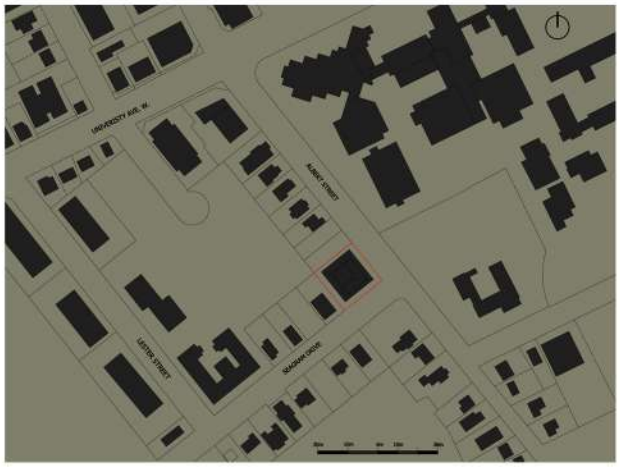
WINTER: DECEMBER 21



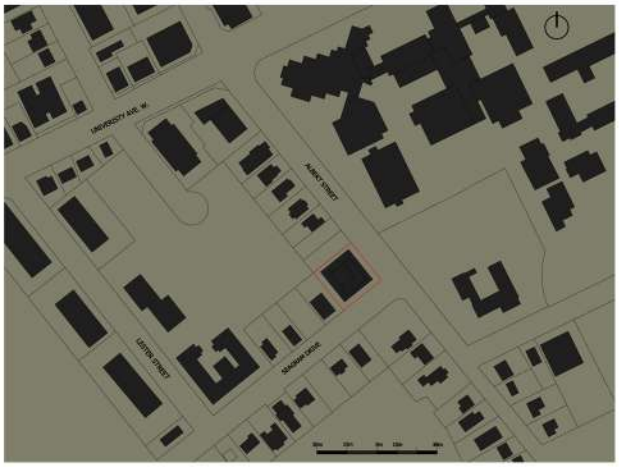
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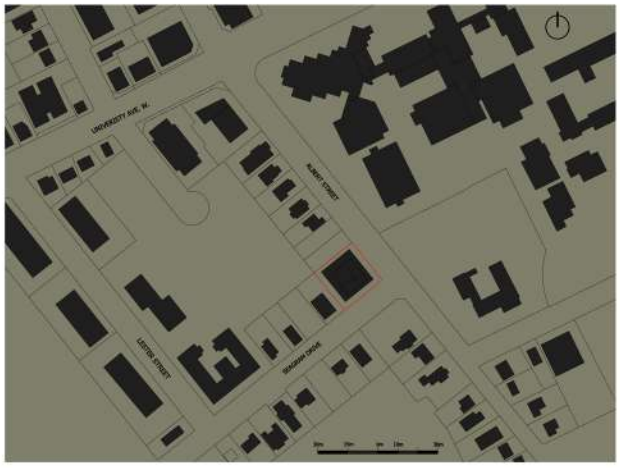
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