

October 27, 2020

Rita Szilock, MCIP, RPP
Development Planner
Waterloo City Centre
100 Regina St S
Waterloo, ON N2A 4J8

Dear Rita:

**RE: Shadow Study for Z-18-09
316 King Street North
Milestone Developments Canada
OUR FILE 1877A**

A Shadow Study was previously submitted with the Zoning By-law Amendment application in 2018. As the building design has been modified, staff requested an update to the Study, to reflect the new massing and to assess any impacts resulting from the redesign. The City has established two guidelines for the consideration of Shadow Studies within the Urban Design Manual:

1. As a principle, at least 50% or more of any property should not be shaded for more than two interval times (a 4 hour equivalency); or
2. As a principle, at least 50% of any property should be in full sun for at least two interval times (a 4 hour equivalency).

It is important to note that the above guidelines do not account for the size of impacted lots. A small lot is inherently more likely to be impacted by shadows than a larger lot, which would have more area outside of any shadows. In the case of the subject lands, the majority of the surrounding parcels have not been consolidated and are small both in their width and depth. For this reason, shadow impacts resulting from any intensification of the subject lands (regardless of its height) are likely to impact the small properties.

Consistent with staff direction, the Shadow Study indicates the existing shadows cast by surrounding buildings (including the existing 10-storey building on the subject lands) and identifies the new shadows cast by the proposed 14-storey addition. The proposed 14 storey addition is a slender tower built form, which assists in moving shadows quickly across the landscape. As a result, the shadows move quickly from the west side of King St N (where significant shadows already exist) towards the adjacent lands to

the north and finally falling across Regina St to the east, where they overlap existing shadows cast by the taller (and larger) buildings on the west side of King St N.

March (Sunset at 7:36 pm)

The following assesses the shadow impacts of the proposed addition on the immediately surrounding properties.

- 324 King St N
 - Shadow impacts approximately 68% of the lot @ 10 am
 - Shadow impacts approximately 65% of the lot @ 12 pm
 - Shadow impacts approximately 59% of the lot @ 2 pm.
 - Shadow impacts approximately 16% of the lot @ 4 pm.
 - No shadow impact @ 6 pm.
 - The lands have less than 50% shadow from approximately 2:30-3 pm until sunset at 7:36 pm, which represents more than a 4 hour equivalency

- 326 King St N
 - Shadow impacts approximately 20% of the lot @ 10 am
 - Shadow impacts approximately 68% of the lot @ 12 pm
 - Shadow impacts approximately 20% of the lot @ 2 pm
 - No shadow impacts @ 4 pm
 - No shadow impacts @ 6 pm
 - The lands have less than 50% shadow from prior to 2 pm until sunset, which represents more than a 4 hour equivalency

- 319 Regina St N
 - No shadow impact @ 10 am
 - No shadow impact @ 12 pm
 - Shadow impacts approximately 6% of the lot @ 2 pm
 - Shadow impacts approximately 100% of the lot @ 4 pm
 - Shadow impacts 100% of the lot @ 6 pm
 - The lands have less than 50% shadow from sunrise until after 2 pm, which represents more than a 4 hour equivalency

- 324 Regina St N
 - No shadow impact @ 10 am
 - No shadow impact @ 12 pm
 - Shadow impacts approximately 25% of the lot @ 2 pm
 - Shadow impacts approximately 93% of the lot @ 4 pm
 - Shadow impacts approximately 100% of the lot @ 6 pm
 - The lands have less than 50% shadow from sunrise until after 2 pm, which represents more than a 4 hour equivalency

Although the development does produce shadow impacts on the adjacent lands, the resulting impacts meet the guidelines.

June (sunset 9:07 pm)

Shadows are typically shortest in summer. As the shadows begin to move towards the east, they are negligible compared with the existing shadows cast by the tall buildings on the west side of King St N. The following assesses the shadow impacts of the proposed addition on the immediately surrounding properties

- 324 King St N
 - Shadow impacts approximately 37% of the lot @ 10 am
 - Shadow impacts approximately 58% of the lot @ 12 pm
 - Shadow impacts approximately 21% of the lot @ 2 pm.
 - No shadow impact @ 4 pm.
 - No shadow impact @ 6 pm.
 - The lands have less than 50% shadow from just after 12 pm until sunset, which represents more than a 4 hour equivalency

- 326 King St N
 - No shadow impact @ 10 am
 - No shadow impact @ 12 pm
 - No shadow impact @ 2 pm
 - No shadow impacts @ 4 pm
 - No shadow impacts @ 6 pm
 - There are no shadow impacts on the lands at this interval.

- 319 Regina St N
 - No shadow impact @ 10 am
 - No shadow impact @ 12 pm
 - Shadow impacts approximately 4% of the lot @ 2 pm
 - Shadow impacts approximately 75% of the lot @ 4 pm
 - Shadow impacts 100% of the lot @ 6 pm
 - The lands have less than 50% shadow from sunrise until after 2 pm, which represents more than a 4 hour equivalency

- 324 Regina St N
 - No shadow impact @ 10 am
 - No shadow impact @ 12 pm
 - Shadow impacts approximately 32% of the lot @ 2 pm
 - Shadow impacts approximately 73% of the lot @ 4 pm
 - Shadow impacts approximately 30% of the lot @ 6 pm
 - There is only one interval where the shadow impacts more than 50% of the lot. As such, the lands have less than 50% shadow for more than a 4 hour equivalency

Although the development does produce shadow impacts on the adjacent lands, the resulting impacts meet the guidelines.

September (Sunset 7:21 pm)

Similar to the shadows cast in March, the shadows move quickly across the landscape, which minimizes their impacts on adjacent lands. The following assesses the shadow impacts of the proposed addition on the immediately surrounding properties

- 324 King St N
 - Shadow impacts approximately 70% of the lot @ 10 am
 - Shadow impacts approximately 69% of the lot @ 12 pm
 - Shadow impacts approximately 57% of the lot @ 2 pm.
 - Shadow impacts approximately 11% of the lot @ 4 pm.
 - No shadow impact @ 6 pm.
 - The lands have less than 50% shadow from approximately 2:30 until sunset at 7:21 pm, which represents more than a 4 hour equivalency

- 326 King St N
 - Shadow impacts approximately 27% of the lot @ 10 am
 - Shadow impacts approximately 70% of the lot @ 12 pm
 - Shadow impacts approximately 11% of the lot @ 2 pm
 - No shadow impacts @ 4 pm
 - No shadow impacts @ 6 pm
 - The lands have less than 50% shadow from prior to 2 pm until sunset, which represents more than a 4 hour equivalency

- 319 Regina St N
 - No shadow impact @ 10 am
 - No shadow impact @ 12 pm
 - Shadow impacts approximately 12% of the lot @ 2 pm
 - Shadow impacts approximately 100% of the lot @ 4 pm
 - Shadow impacts 100% of the lot @ 6 pm
 - The lands have less than 50% shadow from sunrise until after 2 pm, which represents more than a 4 hour equivalency

- 324 Regina St N
 - No shadow impact @ 10 am
 - No shadow impact @ 12 pm
 - Shadow impacts approximately 33% of the lot @ 2 pm
 - Shadow impacts approximately 100% of the lot @ 4 pm
 - Shadow impacts approximately 68% of the lot @ 6 pm
 - The lands have less than 50% shadow from sunrise until after 2 pm, which represents more than a 4 hour equivalency

Although the development does produce shadow impacts on the adjacent lands, the resulting impacts meet the guidelines.

December (Sunset 4:49 pm)

Shadows are longest in the winter, when the sun is low in the sky. In winter, it is important that the public realm be subject to as much sunlight as possible. In this case, the shadows cast by the proposed

development move quickly such that the public realm (King St N) transitions from partial shade at 10 am to no shadow impacts by noon. As with the other times of year, the existing buildings on the west side of King St N and east side of Regina St N cast long shadows on the subject lands and other surrounding properties.

- 324 King St N
 - Shadow impacts approximately 77% of the lot @ 10 am
 - Shadow impacts approximately 72% of the lot @ 12 pm
 - Shadow impacts approximately 62% of the lot @ 2 pm.
 - The development does not meet the criteria, however the shadow impacts are not related to the height of the building. A small, low-rise building would cause similar shadow impacts due to the angle of the sun in the sky.

- 326 King St N
 - Shadow impacts approximately 57% of the lot @ 10 am
 - Shadow impacts approximately 76% of the lot @ 12 pm
 - Shadow impacts approximately 41% of the lot @ 2 pm
 - The development does not meet the criteria, however the shadow impacts are not related to the height of the building. A small, low-rise building would cause similar shadow impacts due to the angle of the sun in the sky
 - The lands will have less than 50% shadow from prior to 2 pm until sunset.

- 319 Regina St N
 - No shadow impact @ 10 am
 - No shadow impact @ 12 pm
 - Shadow impacts approximately 6% of the lot @ 2 pm
 - The lands have less than 50% shadow from sunrise until after 2 pm, which represents more than a 4 hour equivalency

- 324 Regina St N
 - No shadow impact @ 10 am
 - No shadow impact @ 12 pm
 - Shadow impacts approximately 31% of the lot @ 2 pm
 - The lands have less than 50% shadow from sunrise until after 2 pm, which represents more than a 4 hour equivalency

In conclusion, the development achieves the Guideline criteria for all of the surrounding properties, except for the December shadow impacts on 324 and 326 King Street North. However, those impacts are not directly related to the height or design of the building. Given the angle of the sun in the sky, even a low-rise building would cast shadows onto those adjacent properties, such that it would not meet the guideline criteria.

In our opinion, the development represents an appropriate use of land, with a building design that has minimized shadow impacts to the extent possible, while balancing the many other planning goals and objectives advanced in provincial and municipal planning documents.

We trust you find the enclosed submission addresses your comments.

Yours truly,

MHBC

A handwritten signature in black ink that reads "Trevor Hawkins". The signature is written in a cursive style with a large initial 'T'.

Trevor Hawkins, M.PL, MCIP, RPP
Partner

cc. *Milestone Developments Canada*
Andrew Bousfield