

PETER J. LESDOW
ARCHITECT



SUN/SHADOW STUDY

FOR THE

**CITY OF NIAGARA FALLS
OFFICIAL PLAN AMENDMENT &
RE-ZONING APPLICATION**

**KALAR APARTMENT DEVELOPMENT
7302 KALAR ROAD,
NIAGARA FALLS, ONTARIO**

PETER J. LESDOW
A R C H I T E C T

PLANNING & DEVELOPMENT
CITY OF NIAGARA FALLS
4310 Queen Street
P.O. Box 1023
Niagara Falls, ON
L2E 6X5

July 31, 2024,

**RE: SHADOW IMPACTS ON SURROUNDING LANDS
OFFICIAL PLAN AMENDMENT AND ZONING APPLICATION
ADDRESS: 7302 KALAR ROAD,
OWNER: 2131595 ONTARIO INC.
AGENT: PETER LESDOW
PROPOSAL: 412-UNIT APARTMENT DWELLING CONSISTING OF TWO
TOWERS WITH MAXIMUM BUILDING HEIGHTS OF 13 AND 15 STOREYS.**

This Sun and Shadow Study has been prepared for the Official Plan Amendment and Re-Zoning Application with the City of Niagara Falls. It provides support for this application for an apartment development at 7302 Kalar Road, Niagara Falls.

The study follows the format as outlined in the City of Niagara Falls Study Terms of Reference dated December 2023 which includes:

- Part A Project Description, Location and Surrounding uses and spaces.
- Part B Analysis – Sun and Shadow Study drawings in accordance with the Terms of Reference Criteria and Table 1: Shadow Study Times. Note that due to criteria requirements the drawings are in a 24"x36" format and are included as an attachment to this study.
- Part B2 Mitigation design Strategies to reduce the coverage of shadows on Private and Public Areas and improve sun exposure.
- Part C Conclusion – A review and discussion of the Sun and Shadow drawings results meeting 4.0 Shadow Impact Criteria of the Terms of Reference.
- Checklist Completed form outlining the criteria in the preparation of the Sun and Shadow Study drawings including signed declaration by Peter J. Lesdow Architect that the information submitted is accurate and concurs with the criteria submission of the application.

Peter J. Lesdow
A r c h i t e c t

4465 Drummond Road,
Unit 11,
Niagara Falls, Ontario
L2E 6C5
905-357-1112
plesdow@cogeco.net



Part A
Project Description,
Location Surrounding
Uses and Spaces

PART A

PROJECT DESCRIPTION

The proposal is to Re-Zone a Light Industrial site with a one-storey industrial building to allow for an apartment development.

The apartment development will consist of two mid-rise buildings providing 412 units. The south building is to be 15 storeys, and the north building is to be 13 storeys. The two building face each other creating a central landscaped vehicular/pedestrian entrance courtyard.

The tower sections of the apartments are fronted by three storey podiums which run parallel to Kalar Road. The towers are stepped back from the podium's street edge by nearly 18 meters. The roofs of these podiums are designed to be outdoor landscaped amenity areas for the apartment residents.

Parking for the development is provided predominantly underground with visitor parking in the entrance courtyard area. Minimal surface parking on the site to the rear or east side of the apartments.



APARTMENT DEVELOPMENT LOOKING EAST

Project Location

This development is to be located at:
7302 Kalar Road in Niagara Falls, Ontario.
Latitude: 43° 04'06" North
Longitude: 79° 08'05" West

Surrounding Uses and Spaces

The Uses and Spaces surrounding the development are as follows:

South

- Owned by Niagara Peninsula Energy
- Zoned Light Industrial
- Currently used as stock yard

West

- Kalar Road is directly beside 7302 Kalar Road
- Across Kalar Road is Zoned Institutional for a proposed school

North

- Multi-Tenant Plaza at McLeod Road
- Zoned General Commercial
- The southern portion of this property is for parking

East

- Zoned Environmental Protection Area
- Trees and tributary to Warren Creek

Part B – Analysis

Part B1 – Sun and Shadow
Study Drawings

Part B2 - Mitigation

PART B ANALYSIS

B1 DRAWINGS

The Sun/Shadow Study drawings were prepared in accordance with the City of Niagara Falls Sun/Shadow Study Terms of Reference dated December 2023, 3.0 Methodology Table 1: Shadow Study Times and B1: Drawings.

In order to provide a suitable scale for legibility and the coverage are required by the Terms of Reference the drawings are in a 'D' sized page (915mm x 610mm) was necessary.

In total, four dates at nine hourly intervals generates thirty-six Sun/Shadow drawings, numbered SH-1 to SH-36 are included with this report and form part of this analysis.

B2 MITIGATION

There were three Sun/Shadow Design Strategies which were used in the design of this apartment complex. They were used to improve sun exposure and to help mitigate or limit the impact of shadows on this property as well as public and neighbouring properties.

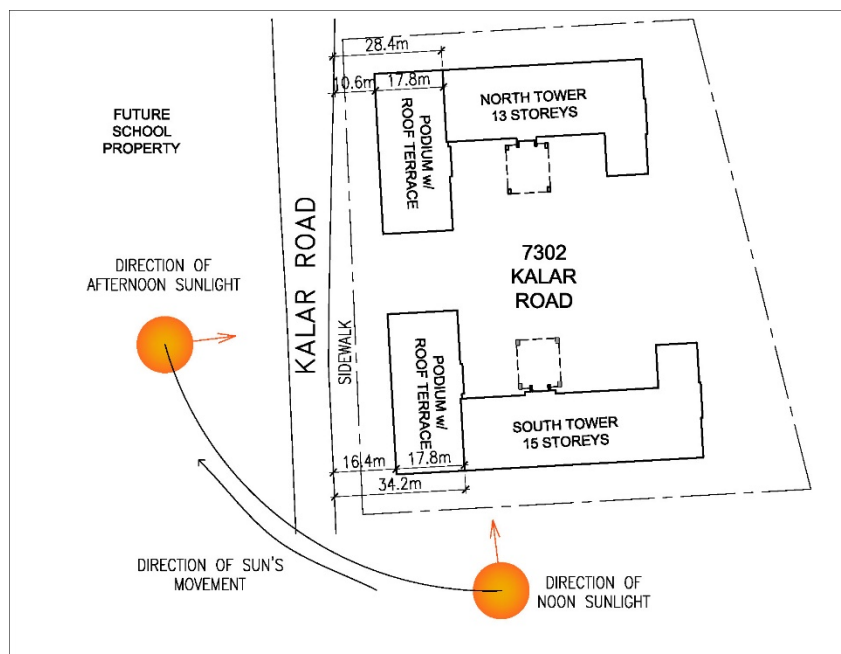
The three Sun/Shadow design strategies are:

- Podium and tower placement
- Orientation of tower
- Separation of towers

Below is a discussion of each of these design strategies implementation for this apartment complex design.

PODIUM AND TOWER PLACEMENT

The apartment design provides a three-storey podium for each tower which run parallel to Kalar Road. The towers of each apartment are set back 17.8m from the podium's westerly or Kalar Road-facing edge. The podium's themselves are set back a minimum of 10.6m from Kalar Road's edge, which provides a minimum setback of the towers to Kalar Road of 28.4m.



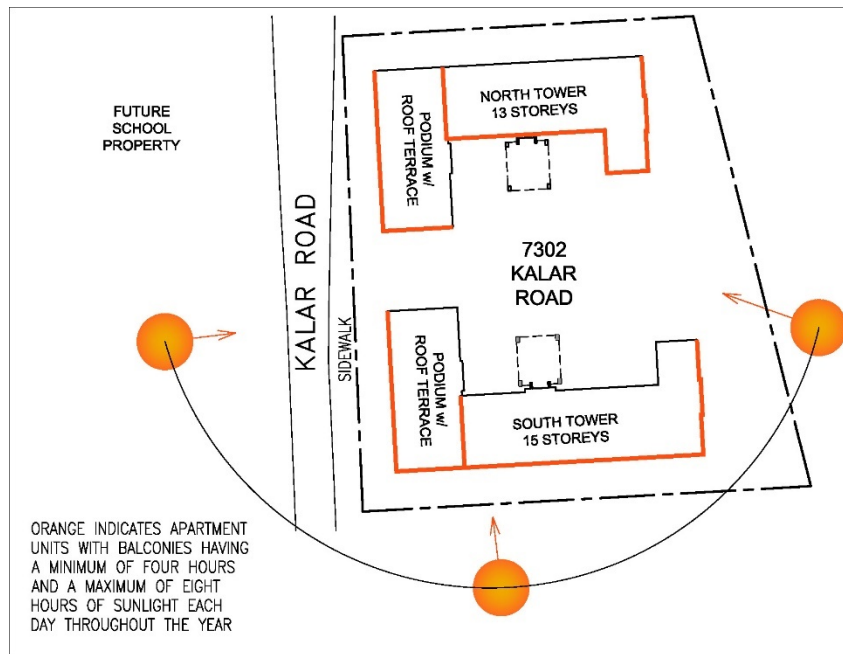
The arrangement shown in the site plan sketch on the previous page shows how the design and positioning of the buildings negates long-term impacts of shadows on its site and in particular, its westerly neighbour. This is done through:

- The three-storey podium's position on the west side of the site and its rooftop receives full sunlight from just after 12pm to 6pm all year round.
- The towers east-west orientation with their narrow westerly building faces limits shadowing on Kalar Road. Being set back over 28m the tower placements reduce shadow impacts along Kalar Road and casts virtually no shadows onto the property of the future school to the roads west.
- The sidewalk along Kalar Road will have full sunlight from noon until the end of the day throughout the year.

ORIENTATION OF TOWERS

The apartment towers are oriented east-to-west across the property. Not only does this orientation significantly reduce the towers visual mass facing Kalar Road it also provides the maximum amount of sun exposure for the apartment units themselves. In this arrangement well over three-quarters of the apartment units with their associated balconies will have a minimum of four hours of sunlight, and as much as eight hours per day all year.

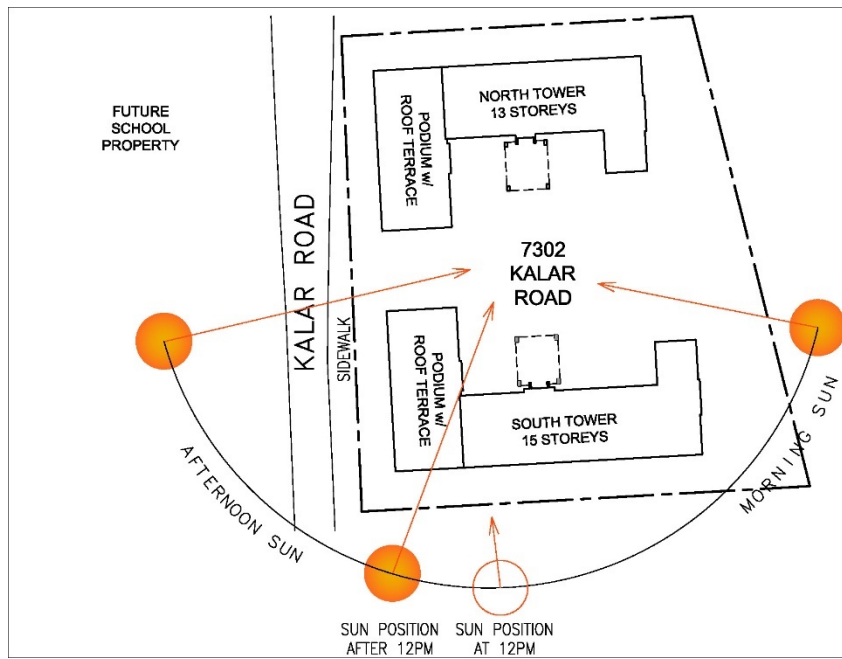
The illustration below shows the apartment building elevations which will receive the amounts of sunlight noted described above.



SEPARATION OF TOWERS ON SITE

The north and south towers are the maximum distance apart from each other that they can possibly be. In fact, variances have been requested to the City Zoning By-laws Interior Side-yard Setback minimum to increase the distance between the towers.

This maximized separation of the towers on site provides for the most possible sun exposure into the vehicular and pedestrian entrance court between the towers as shown in the illustration on the next page.



The Design Strategies as described above and implemented in this development have contributed to it and its surrounding properties receiving the maximum sun exposure possible considering the physical massing of the towers. These Design Strategies have mitigated or limited the impacts of shadows and helped in meeting the Sun/Shadow Terms of Reference 4.0 Shadow Impact Criteria.

CONCLUSION

This conclusion is based on the review of all thirty-six Sun/Shadow drawings enclosed with this study. This review analyzes how the apartment development adheres to the Terms of Reference 4.0 Shadow Impact Criteria of exposure, coverage times and dates.

The conclusion follows the same format as 4.0 Shadow Impact Criteria which is identified as the indented **blue text**. The review of the drawings is summarized below each subsection is in black text.

4.2 Private Realm

4.2.1 – Outdoor Residential Amenity Spaces on Adjacent Properties

To minimize the impact of shadow on existing adjacent properties from new development, adjacent residential amenity areas should receive at a minimum of 6 hours of sunlight between 10am to 6pm.

- April 21 to September 21

At this time the only residential amenity areas to be found at adjacent properties are at a newer townhouse development to the northeast of 7302 Kalar Road, at 8196 McLeod Road. The amenity spaces occur in the northern half of this property, more than roughly 50 meters from the north tower.

From April to June the proposed towers cast minimal shadows onto the southern wooded half of this property and do not affect amenity spaces.

Shadows fall further north onto this property in September, but amenity spaces appear to not suffer a loss of daily sunlight apart from the during the hours of 2 and 3 o'clock.

Based on the shadow analysis, adjacent residential amenity areas will receive more than 6 hours, and typically 8 hours of sunlight between 10am to 6pm daily from April 21 to September 21 meeting Shadow Impact Criteria 4.2.1.

4.2.2 - Outdoor Residential Amenity Spaces within the proposed development

To maximize the functionality of private outdoor amenity spaces associated with new developments with rear yards, rooftop spaces, balconies, decks, and other shared common spaces, amenity areas should receive at least 4 hours of sun between 10am to 6pm.

- April 21 to September 21

The development at 7302 Kalar does not have rear yard amenity space.

Each tower of this development offers a rooftop amenity area on the west side of the building on its podium roof. Due to its orientation, throughout the year the rooftop amenity area of the North Tower will be exposed to higher amounts of sunlight than the South Tower.

For the North Towers podium, from April 21 to September 21 starting from 10:00am sunlight will cover more than 50% of its surface, and by 1:00pm through these months it will be in full sunlight for the remainder of the day. This means that from April 21 to September 21 this amenity space will be in full sunlight for the 5 hours between 1:00pm and 6:00pm.

For the south towers podium, from April 21 to September 21 starting from 12:00pm sunlight will cover more than 40% of its surface, and by 1:00pm through these months it will be in full sunlight for the remainder of the day. This means that from April 21 to September 21 this amenity space will be in full sunlight for the 5 hours between 1:00pm and 6:00pm.

Balconies are found on the nearly every face of the buildings and those with southern exposure will receive no less than 8 hours of sunlight daily throughout the year. Those with western exposure will receive full sunlight from 1:00pm until 6:00pm, for 5 hours of sunlight daily. The easterly facing balconies will receive sunlight from 10:00am until about 2:00pm, for 4 hours of sunlight daily from April 21st to September 21st. Balconies on the north side of the buildings will receive 1 to 2 hours of sunlight daily in June, but this is typical of any building with a northern exposure and cannot be remedied.

It must be noted that a practically designed apartment building will usually have a portion of its elevations along with its associated balconies with a northern exposure which will have no exposure to the sun. Exceptions to such a situation would be a building whose length runs north-to-south across a site with minimum width at its north end without balconies. However, not all sites are conducive to such a positioning, and in this case such a building would tend to create a wider shadow. For this reason the Shadow Impact Criteria requesting all building elevations or balconies to have a minimum of four hours of sunlight is not reasonable or attainable and should be amended in consideration of northern exposed elevations.

Therefore with this developments rooftop amenity spaces design exceed the requirements of Criteria 4.2.2.

Balconies which are on the east, south and west building elevations also meet or exceed the criteria of 4.2.2 for full sun exposure. As noted above the 4.2.2 Criteria is not attainable for balconies with a northern exposure which is typical for many apartment buildings.

4.3 PUBLIC REALM

4.3.1 – Public Outdoor Amenity Spaces

Communal Outdoor Amenity Spaces include school yards, children’s play areas, public outdoor pools, community gardens, privately owned public spaces, Civic and Cultural Spaces, and other outdoor public areas.

Shadows cast by existing buildings and shadows from proposed buildings should allow for 5 hours of full sun between 10am-6pm on:

- April 21

School yards and children’s play areas should receive at least 3hours of sun on:

- December 21st (10am to 3pm)

It should be noted that public outdoor pools, community gardens, privately owned public spaces, Civic and Cultural Spaces, or other outdoor public areas uses or properties are not affected by the shadows from 7302 Kalar.

There is a school proposed on the across Kalar Road, west from this development. Review of the Sun/Shadow Study on December 21st between 10am to 3pm show that the future schoolyard and children’s play areas will receive at least 4 hours of full sun which exceeds 4.3.1 Criteria requirements.

4.3.2 – Sidewalk areas and boulevards along the frontage of the development

Streets with residential and mixed-uses, enlivened with people on sidewalks, patio spaces, trees, and where significant numbers walk, cycle, or ride transit should continue to receive a minimum of 4 hours of sun 10am to 6pm.

- April 21st (The south sides of streets with East and West orientations may receive less sunlight)

7302 Kalar is on the eastern side of Kalar Road. On any day of the year the shadow studies show the sidewalk along Kalar will be in full sunlight from 12:00pm until sunset daily. Therefore the sidewalk

will receive no less than 6 hours of sunlight daily which exceeds 4.3.1. Criteria requirements.

4.3.3 – Parks, Open spaces, and natural heritage areas

Shadows cast by existing buildings and proposed developments surrounding parks and other open spaces should not exceed 3 hours in duration between the hours of 10am to 6pm on:

- April 21st
- September 21st

There are no parks, open spaces or natural heritage areas in close proximity which the construction of the towers shadowing would result in them meeting 4.3.3 Criteria requirements.

The property adjacent to the development on its east is an Environmental Protection Area. Although this area does not fall within the criteria of 4.3.3, the shadow studies show that the building will cast shadows towards and across it starting from 3:00pm on April 21st and from 2:00pm on September 21st. That said, the spacing and position of the towers, combined with the movement of the shadows, results in the Environmental Protection Area never being fully deprived of sunlight for longer than 3 hours which meets 4.3.3 Criteria requirements.

(Natural heritage areas subject to an Environmental Impact Study (EIS) that requires additional sunlight should be identified).

There are no Natural Heritage Areas in the surrounding areas.

The Sun/Shadow Study's review of this apartment development shows that it meets or exceeds all Terms of Reference 4.0 Shadow Impact Criteria. This is with the exception of north-facing balconies which as discussed in this review is not possible. It was also discussed that practically designed apartments usually have units with their associated balconies with a northern exposure and for this reason the Shadow Impact Criteria for north-facing balconies should be amended accordingly.

Therefore, the Sun/Shadow Study supports this Official Plan Amendment and Re-Zoning Application.

Respectfully,



Peter J. Lesdow
B.A., B.Arch., O.A.A., M.R.A.I.C., N.C.A.R.B.



CHECKLIST

Declaration of Consultants

Checklist

1.General	
A. Name of the Project: Kalar Apartments	B.Date: August 01, 2024
C. Address of Application: 7302 Kalar Road	D.Name of Consultant: Peter J. Lesdow Architect
E. Phone number and email of the Consultant: 905-357-1112 plesdow@cogeco.net	

2.Project Description	
A.Short Description of the Project: Apartments to provide 412 units with two floors parking below grade.	
B. Number of buildings for this Application: Two	
C.Number of Floors : 13 and 15	D. Height in Metres : 41.25 and 46.80
E.Did you submit the 3d Model for this project?	Yes..... <input checked="" type="checkbox"/> No.....
File Format Submitted:	

3.Massing Information	
A.Software Used ShadeMap	B.Terrain Corrected :
If Other describe below:	Yes..... <input checked="" type="checkbox"/> No.....

4.Massing Model Location	
A.Coordinates Used: Longitude: 43° 04'06" N Latitude: 79° 08'05" W	B.Solar North Matches True North? <input checked="" type="checkbox"/> Yes..... No.....

5.Shadow Diagrams Information	
A.Are you fully compliant with all of the technical specifications in the Terms of Reference? <input checked="" type="checkbox"/> Yes..... No.....	
B.Do the Shadow Diagrams use a standard metric scale?	<input checked="" type="checkbox"/> Yes..... No.....
C.Are the Shadow Diagrams provided in Colour?	<input checked="" type="checkbox"/> Yes..... No.....
D.Does the Shadow Diagrams use The City's Shadow Study Drawing Standards – Colour Analysis?	<input checked="" type="checkbox"/> Yes..... No.....

5.Shadow Diagrams Information – Continued			
D.Date Used for Shadow Analysis:	As prescribed	Year.....	Month.....
E.Daylight Savings Time considered?		<input checked="" type="checkbox"/> Yes.....	No.....

6.General Comments

Declaration of Consultant
I Peter J. Lesdow certify that I have examined the contents of the application, certify that the information submitted with it is accurate and concur with the submission of the application. Date: JULY 31, 2024 Signature of Consultant: 