



1027458 Ontario Inc.

## Official Plan Amendment and Zoning By-law Amendment

Shadow Impact Study

Phase 6 – South of Wyandotte Street East

Windsor, Ontario

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# Introduction

Dillon Consulting Limited (Dillon) has prepared the following Shadow Impact Study, on behalf of our client, 1027458 Ontario Inc., (Applicant), to assess the potential impact of the shadows created by the proposed multiple dwelling residential development. The property is located south of Wyandotte Street East in the North Neighbourhood within the East Riverside Planning Area in the City of Windsor (“Subject Site”).

As per the City of Windsor Official Plan – Chapter 8: Urban Design, Shadow Impact Studies may be required for medium, high, and very high-profile development proposals within the City of Windsor to evaluate the impact of the shadows cast by the development and to determine the appropriate design measures to reduce or mitigate any undesirable shadow conditions (City of Windsor Official Plan, Section 8.6.2.3).

The size, shape, and orientation of new buildings creates new shadows at different times of day and year that may limit penetration of direct sunlight into both public and private spaces. By analyzing the existing and proposed shadows of an area together, both incremental and cumulative shadow impacts can be evaluated. The purpose of the Shadow Impact Study is to encourage high-quality development that maintains adequate access to sunlight, for the enjoyment of public and private spaces, within the City of Windsor.

Within the East Riverside Planning Area, North Neighbourhood the Applicant is proposing a residential development with seven (7) phases (refer to [Appendix A \(Conceptual Development Plan – Master Phasing Plan\)](#)). The Shadow Impact Study considers Phase 6 of the larger residential development, which is proposed to be developed with three (3) 6-storey residential buildings containing 63 units each, and two (2) 12-storey residential buildings containing 129 units, for a total of 447 units on the subject site. A one (1) level underground parking area is proposed, connected under Buildings ‘D’ and ‘E’ (refer to [Appendix B \(Conceptual Development Plan – Phase 6\)](#)).

This Shadow Impact Study has been prepared in support of the Official Plan Amendment and Zoning By-law Amendment applications, required to permit the proposed development.

## Description of Site

The Subject Site is located south of Wyandotte Street East within the East Riverside Planning Area and will have frontage along four (4) rights-of-ways. The Subject Site is bounded by Wyandotte Street East, the future Lublin Avenue and Clover Avenue extensions, and the future Copernicus Street right-of-way. The property is municipally known as 0 Wyandotte Street East (west of Lublin Avenue, North of Copernicus Street). Further, the property is legally described as: Part of Block A on Plan 1161; Part Streets and Alleys (Closed By R1088686); Part Lots 14, 31, 34, and 52 and all of Lots 32, 33, and 53 on Plan 1230; Part Lots 139, 140, and 141 Concession 1 in the City of Windsor, County of Essex, Ontario.

The total site area under application is approximately 3.48 hectares (8.60 ac) in size, with a frontage of 96.3 metres (315.9 ft.) along Clover Avenue and 127.7 metres (418.9 ft.) along Wyandotte Street East. The Subject Site is currently vacant.

The surrounding area supports a mix and range of residential uses with some open space and institutional uses. There are a number of single detached, semi-detached, and townhome dwellings that make up the residential fabric of the area. Nearby the Subject Site is the Riverside Sportsmen Club, East End Park, and the Little River Corridor. Further north of the Subject Site is the Detroit River.

## 1.2 Proposed Development

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The proposed development includes the construction of three (3) 6-storey residential buildings containing 63 units each, and two (2) 12-storey buildings containing 129 units, for a total of 447 units. A one (1) level underground parking area is proposed, connected under Buildings 'D' and 'E'. Three (3) access points to the Subject Site are proposed via driveways located along the future extension of Clover Avenue, Copernicus Street, and Lublin Avenue rights-of-ways.

Refer to [Appendix B \(Conceptual Development Plan – Phase 6\)](#).



## Methodology

The Shadow Impact Study was prepared in accordance with the following methodology:

- Utilization of Google Sketch Up for the shadow simulations;
- Generation of the surrounding massing data from municipal Land Fabric data and by using municipal aerial imagery;
- Preparation of the preliminary massing of the proposed development using Google Sketch Up;
- Surrounding context building heights and proposed building heights were determined through standardized floor to floor heights:
  - Single storey: 4.5 metres;
  - Two storeys: 7.5 metres; and
  - Each storey of multiple dwelling buildings: 4.0m.

The shadow diagrams include the following features:

- The Subject Site identified in a red outline with the proposed building footprint;
- Surrounding existing and approved building footprints;
- Underlying parcel fabric;
- Shadows from the proposed development are colour coded in a blue hue;
- Shadows from existing and approved buildings are colour coded in a grey hue; and
- All streets, blocks, open spaces, and existing building structures are shown to a distance that shows the shadow impacts during the requested times.

The shadow analysis and impact assessment are based on the following criteria:

- Impact on surrounding residential properties and the duration of shadows;
- Impact on the public realm;
- Impact on any parks and open spaces; and
- Impact on outdoor amenity areas of the proposed development.

## Study Test Dates

The shadow impacts of the proposed residential development have been evaluated at the following dates:

- March 21<sup>st</sup> (vernal equinox);
- June 21<sup>st</sup> (summer solstice);
- September 21<sup>st</sup> (autumnal equinox); and
- December 21<sup>st</sup> (winter solstice).

The study test dates were selected to reflect the variety of shadow impacts that may occur within the year. The solstices, June 21<sup>st</sup> and December 21<sup>st</sup>, represent the seasonal extremes for each season. June

21<sup>st</sup> is the longest day of the year when the sun is at its highest and the shadows are the shortest, while December 21<sup>st</sup> is the shortest day of the year when the sun angle is at its lowest and the shadows are the longest.

## 2.2 Study Test Times

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The shadow impacts of the proposed residential development have been evaluated at the following test times:

- 7:00 am
- 8:00 am
- 9:00 am
- 10:00 am
- 11:00 am
- 3:00 pm
- 4:00 pm
- 5:00 pm
- 6:00 pm
- 7:00 pm

Study test times may vary depending on the study test date. The study test times have been appropriately selected to evaluate the relevant shadow impacts at the selected time of year.

## 2.3 Time Zone

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The Shadow Impact Study was prepared using the following time zone standards:

- Eastern Time Zone;
- Standard Time: Universal Time minus 5 hours (Winter Solstice – December 21<sup>st</sup>); and
- Daylight Saving Time: Universal Time minus 4 hours (Summer Solstice – June 21<sup>st</sup>, Autumnal Equinox – September 21<sup>st</sup>, and Vernal Equinox – March 21<sup>st</sup>).

## 3.0 Shadow Impact Analysis

### 3.1 March 21 Analysis

The shadow impacts of the proposed development on the surrounding area have been evaluated on March 21<sup>st</sup> using the study time intervals of 8:00 am through and up until 6:00 pm.

Between 8:00 am and 9:00 am, the simulated shadows will extend beyond the Subject Site and have an impact on the future residential properties located west of the Subject Site along Clover Avenue, Elinor Street and Jerome Street. The impacted residential properties along Clover Avenue and Jerome Street are not yet constructed. The future residential properties are to be constructed as part of Phases 3 and 5 of the North Neighbourhood development. The eastern façade of Building 'E' is anticipated to be impacted within the development, as well as part of the surface parking area. During the morning hours, the East End Park will experience shadow impacts.

By 10:00 am, the shadow impacts on the residential properties located along Clover Avenue, Elinor Street and Jerome Street are resolved, as well as the eastern façade of Building 'E'. From 10:00 am until 3:00pm, the impacts of the potential shadows continue to be limited, with minimal impact to the surface parking area on the Subject Site.

At 3:00 pm, the simulated shadows shift east causing limited shadow impacts along Wyandotte Street East and the property located at 10835 Riverside Drive East. There are also anticipated impacts to the public realm at this time as the proposed shadow of Building 'C' causes shadow coverage along the Lublin Avenue right-of-way. The impacts to the interior surface parking area are minimal. From 4:00 pm through and until 6:00 pm, the proposed shadows will have a limited impact on the adjacent future residential properties along Lublin Avenue, which will be constructed as part of Phase 2 of the North Neighbourhood development. These anticipated shadow impacts are limited in duration.

In summary, March 21<sup>st</sup> shadowing is anticipated to be the most prominent during the morning hours, impacting the existing and proposed residential properties located along Clover Avenue, Elinor Street and Jerome Street. Additionally, there are shadow impacts anticipated at this time to the public realm, notably in the East End Park, as well as along the Wyandotte Street East and Lublin Avenue rights-of-ways. The impacts of the proposed shadow on the public realm are anticipated to occur for a short period of time, and with adequate sun coverage on affected pedestrian sidewalks and green spaces during the daytime. The proposed shadows are not expected to have any negative impacts on user experience or quality of life. Overall, the shadow impacts are not sustained in duration and are therefore not anticipated to have a significant impact on the affected properties, the experience of the public realm, nor on the natural environmental quality that supports the growth of trees and other vegetation.

Refer to [Appendix C \(Shadow Diagrams – March 21\)](#).

## 3.2 June 21 Analysis

The shadow impacts of the proposed development on the surrounding area have been evaluated on June 21<sup>st</sup> using the study time intervals of 8:00 am through and up until 7:00 pm.

In the morning hours, the simulated shadows are anticipated to extend beyond the Subject Site causing impacts on the existing and future residential properties located to the west of the Subject Site, along Clover Avenue, Elinor Street, Jerome Street and Thunderbay Avenue. The surface parking area on the Subject Site will experience shadow coverage at this time, along with the proposed East End Park. By 8:00 am, the shadow impacts on the residential properties located along Clover Avenue, Elinor Street, Jerome Street and Thunderbay Avenue are resolved. The East End Park continues to experience partial shadow coverage beyond 8:00 am until 10:00 am. These potential shadow impacts are not sustained in duration and are therefore not anticipated to have any significant impact on the affected properties or the experience of the public realm, nor on the natural environmental quality that allows trees and vegetation to thrive.

From 8:00 am through and until 5:00 pm, the impacts of the potential shadows are primarily limited to the Subject Site, with minimal impact to the surface parking area on the Subject Site.

At 6:00 pm, the simulated shadows shift east and are anticipated to have a minimal shadow impact on Wyandotte Street East and Lublin Avenue. The shadow impacts to the surface parking area on the Subject Site are minimal. From 6:00 pm through and until 7:00 pm, the proposed shadow extends across Lublin Avenue, having a limited impact on approximately 10 future residential properties along Lublin Avenue, which are to be constructed as part of Phase 2 of the North Neighbourhood development. The anticipated shadows are brief in duration.

In summary, June 21<sup>st</sup> shadowing is the most significant and the longest in the morning hours, impacting the existing and proposed residential properties located along Clover Avenue, Elinor Street, Jerome Street and Thunderbay Avenue the most. Additionally, there are some shadow impacts anticipated to the public realm, notably in the East End Park, as well as along the Wyandotte Street East and Lublin Avenue rights-of-ways. The impacts of the proposed shadow on the public realm are anticipated to occur for a short duration of time. Adequate sun coverage on pedestrian sidewalks and green spaces is anticipated during the daytime hours. The proposed shadows are not expected to have negative impacts on user experience or quality of life.

Refer to [Appendix D \(Shadow Diagrams – June 21\)](#).

## 3.3 September 21 Analysis

The shadow impacts of the proposed development on the surrounding area have been evaluated on September 21<sup>st</sup> using the study time intervals of 8:00 am through and up until 6:00 pm.

At 8:00 am, the simulated shadows are anticipated to extend beyond the Subject Site causing impacts on the residential properties located west of the Subject Site along Clover Avenue, Elinor Street, and Jerome Street. Portions of the surface parking area on the Subject Site are covered, along with a large portion of the East End Park. The shadow impacts are not sustained in duration and are therefore not anticipated to have a significant impact on the affected properties or the experience of the public realm.

By 9:00 am, the shadow impacts on the existing and proposed residential properties located along Clover Avenue, Elinor Street, and Jerome Street are resolved. A segment of the East End Park and the surface parking area on the Subject Site remain impacted by shadows at this time. From 9:00 am through and until 4:00 pm, the impacts of the potential shadows are limited, with majority of the shadow impacts being contained within the Subject Site. Trees and vegetation will receive adequate sun exposure during the daytime hours.

At 5:00 pm, the simulated shadows shift east causing minimal shadow impacts along Wyandotte Street East and Lublin Avenue. From 5:00 pm through and until 6:00 pm, the anticipated shadow impacts the future residential properties along Wyandotte Street East, Lublin Avenue, and Icewater Avenue, although the impacts are limited in duration. The future residential properties are to be constructed as part of Phases 2 and 7 of the North Neighbourhood development.

In summary, September 21<sup>st</sup> shadowing is the most significant and the longest in the morning hours, impacting the existing and proposed residential properties located along Clover Avenue, Elinor Street, and Jerome Street the most. Additionally, there are limited shadow impacts anticipated to the public realm, notably in the East End Park, as well as along the Wyandotte Street East and Lublin Avenue rights-of-ways. The impacts of the proposed shadow on the public realm are anticipated to occur for a short duration of time, with adequate sun coverage anticipated on pedestrian sidewalks and green spaces during the daytime hours. The proposed shadows are not expected to have negative impacts on user experience or quality of life.

Refer to [Appendix E \(Shadow Diagrams – September 21\)](#).

### 3.4 December 21 Analysis

The shadow impacts of the proposed development on the surrounding area have been evaluated on December 21<sup>st</sup> using the study time intervals of 9:00 am through and up until 4:30 pm.

At 9:00 am, the simulated shadows extend beyond the Subject Site causing impacts to a limited number of the future residential properties located along Clover Avenue and Jerome Street. The surface parking area on the Subject Site is anticipated to experience shadow coverage along with portions of the East End Park at this time. The anticipated shadow impacts are not sustained in duration and are therefore not anticipated to have a significant impact on the affected properties.

By 10:00 am, the shadow impacts on the residential properties located along Clover Avenue are resolved with portions of the East End Park continuing to have limited shadow impacts. Approximately two (2)

properties north of Wyandotte Street East are anticipated to experience limited shadow impacts. From 10:00 am through and until 2:00 pm, the impacts of the potential shadows are limited outside of the Subject Site, mainly affecting vacant parcels of land that may potentially be developed future residential dwellings.

At 2:00 pm, the simulated shadows shift east causing minimal shadow impacts along Wyandotte Street East and Lublin Avenue. From 2:00 pm through and until 4:30 pm, the proposed shadow impacts the existing and future residential properties north of Wyandotte Street East and east Lublin Avenue, which are to be constructed as part of Phases 2 and 7 of the North Neighbourhood development. By 4:30 pm, the shadows extend northeast towards the north end of Chateau Avenue with approximately 20 properties along Wyandotte Street East, Lublin Avenue, and Icewater Avenue experiencing shadow coverage for a limited duration of time.

In summary, December 21<sup>st</sup> shadowing is the most significant and the longest in the evening hours, primarily impacting the residential properties located along Wyandotte Street East and Lublin Avenue. Additionally, there are some shadow impacts anticipated on the public realm, notably at the intersection of Wyandotte Street East and Lublin Avenue. The prolonged impacts at this time of year are largely due to the low angle of the sun throughout the winter. The sun exposure experienced within the public realm and at each residential property remains at an acceptable level over the course of the day. Overall, no negative impacts to the experience of the public realm or surrounding area are anticipated as a result of the proposed development.

Refer to [Appendix F \(Shadow Diagrams – December 21\)](#).

## 4.0

## Summary

In summary, it is our opinion that shadow impacts from the proposed development are limited overall. Any shadow impacts occurring for extended periods of time on adjacent properties remains at an acceptable level. Access to sunlight during the daytime hours has been maintained in relation to the public realm, open space, existing and proposed residential properties, and proposed residential amenity areas.

## 4.1

### Design Strategies for Shadow Mitigation

In an effort to reduce any potential negative shadow impacts, certain design strategies have been included such as:

- Building massing. Adjustments such as building setbacks from the property lines have been considered in an effort to consider an appropriate relationship with the pedestrian scale and to maintain an attractive streetscape;
- Building placement. The placement of the residential buildings on the Subject Site has been designed to ensure that there is adequate space separation between the built forms which will allow sunlight to penetrate through and to the Subject Site; and
- Building orientation. The proposed residential buildings are orientated in a manner that aims to reduce the significance and duration of the shadow impacts on the surrounding existing and proposed low profile residential properties.

Other design strategies may be considered at the Site Plan Control stage including, but not limited to, the following:

- Providing high quality landscape treatment such as decorative fencing, trees, and grassed areas to mitigate the perceived massing impacts of the built form;
- Including building stepbacks as the built form increases in height;
- Breaking up the mass horizontally and vertically through the creative incorporation of changes in materials and architectural features; and
- Incorporating windows and balconies on all elevations with creative balcony and floor plate design which includes strategically located unit/amenity area locations.

## 4.2

### Conclusion

In conclusion, it is our opinion that the shadow impacts from the proposed residential development are overall minor in effect and short in duration. The proposed shadows have a limited level of impact for the following reasons:

- The majority of cumulative shadowing impacts are moderate and shorter in duration, with shadow impact falling primarily away from residential properties;
- The shadow impacts occurring to the Subject Site largely affect the proposed surface parking area. The shadow coverage occurring to the surface parking area may be beneficial in assisting to mitigate any heat island effect by keeping asphalt temperatures cooler during the daytime hours;
- The shadow impacts to the adjacent East End Park are not anticipated to have any negative impact on the natural environmental quality that allows trees and vegetation to thrive;
- Of the shadowing impacts identified, the majority occur around sunrise or sunset, meaning that the neighbouring residential properties and the East End Park will continue to retain adequate sunlight access for leisure and recreation activities during the daytime hours, and increasingly in the warmer months; and
- The public realm is anticipated to experience some shadow coverage; however, the shadowing is limited in duration and by time of year. Any affected pedestrian sidewalks/trails maintain adequate sunlight coverage during the daytime hours. As such, it will not cause unreasonably negative impacts for, or deter from, the ability for community members to use the public realm in these particular areas.

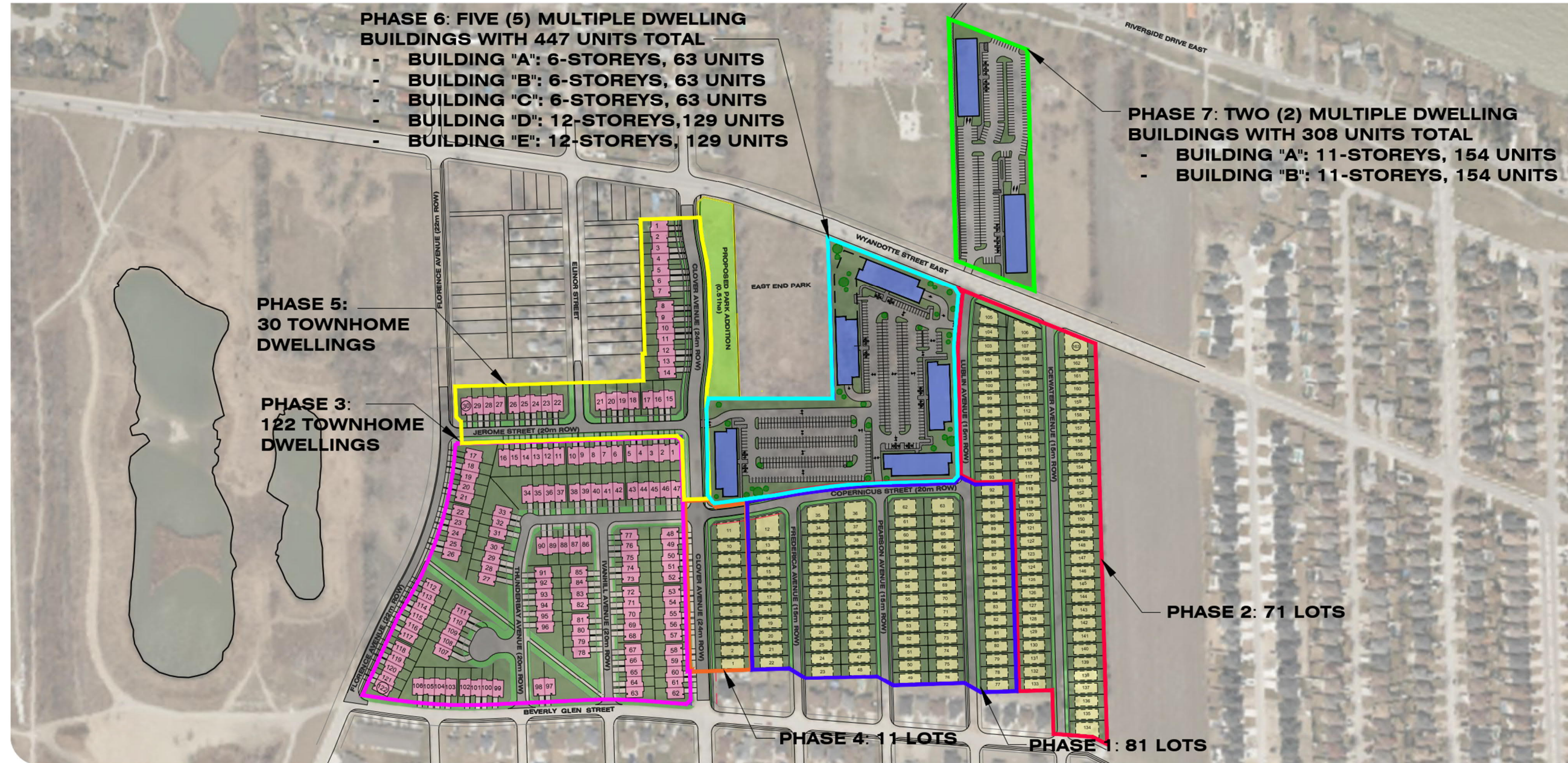


# Appendix A

## Conceptual Development Plan – Master Phasing Plan



Figure 1: Concept Plan – Master Phasing Plan



**PHASE 6: FIVE (5) MULTIPLE DWELLING BUILDINGS WITH 447 UNITS TOTAL**

- BUILDING "A": 6-STOREYS, 63 UNITS
- BUILDING "B": 6-STOREYS, 63 UNITS
- BUILDING "C": 6-STOREYS, 63 UNITS
- BUILDING "D": 12-STOREYS, 129 UNITS
- BUILDING "E": 12-STOREYS, 129 UNITS

**PHASE 7: TWO (2) MULTIPLE DWELLING BUILDINGS WITH 308 UNITS TOTAL**

- BUILDING "A": 11-STOREYS, 154 UNITS
- BUILDING "B": 11-STOREYS, 154 UNITS

**PHASE 5:  
30 TOWNHOME DWELLINGS**

**PHASE 3:  
122 TOWNHOME DWELLINGS**

**PHASE 2: 71 LOTS**

**PHASE 4: 11 LOTS**

**PHASE 1: 81 LOTS**

**1027458 ONTARIO INC.**  
EAST RIVERSIDE DEVELOPMENT  
NORTH NEIGHBOURHOOD

**CONCEPTUAL DEVELOPMENT PLAN**  
MASTER PHASING PLAN  
JUNE 5, 2023

|                                 |                                    |                                  |                                 |                                 |                                 |                                 |
|---------------------------------|------------------------------------|----------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| SUBJECT AREA PHASE 1 (± 4.51ha) | SUBJECT AREA PHASE 2 (± 3.90ha)    | SUBJECT AREA PHASE 3 (± 6.22ha)  | SUBJECT AREA PHASE 4 (± 0.93ha) | SUBJECT AREA PHASE 5 (± 2.30ha) | SUBJECT AREA PHASE 6 (± 3.48ha) | SUBJECT AREA PHASE 7 (± 1.65ha) |
| PROPOSED TOWNHOMES              | PROPOSED SINGLE DETACHED DWELLINGS | MULTI-UNIT RESIDENTIAL BUILDINGS | PROPOSED ROW                    | PROPOSED PARK LANDS             |                                 |                                 |

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CHECKED BY: KDT  
DESIGNED BY: MRU

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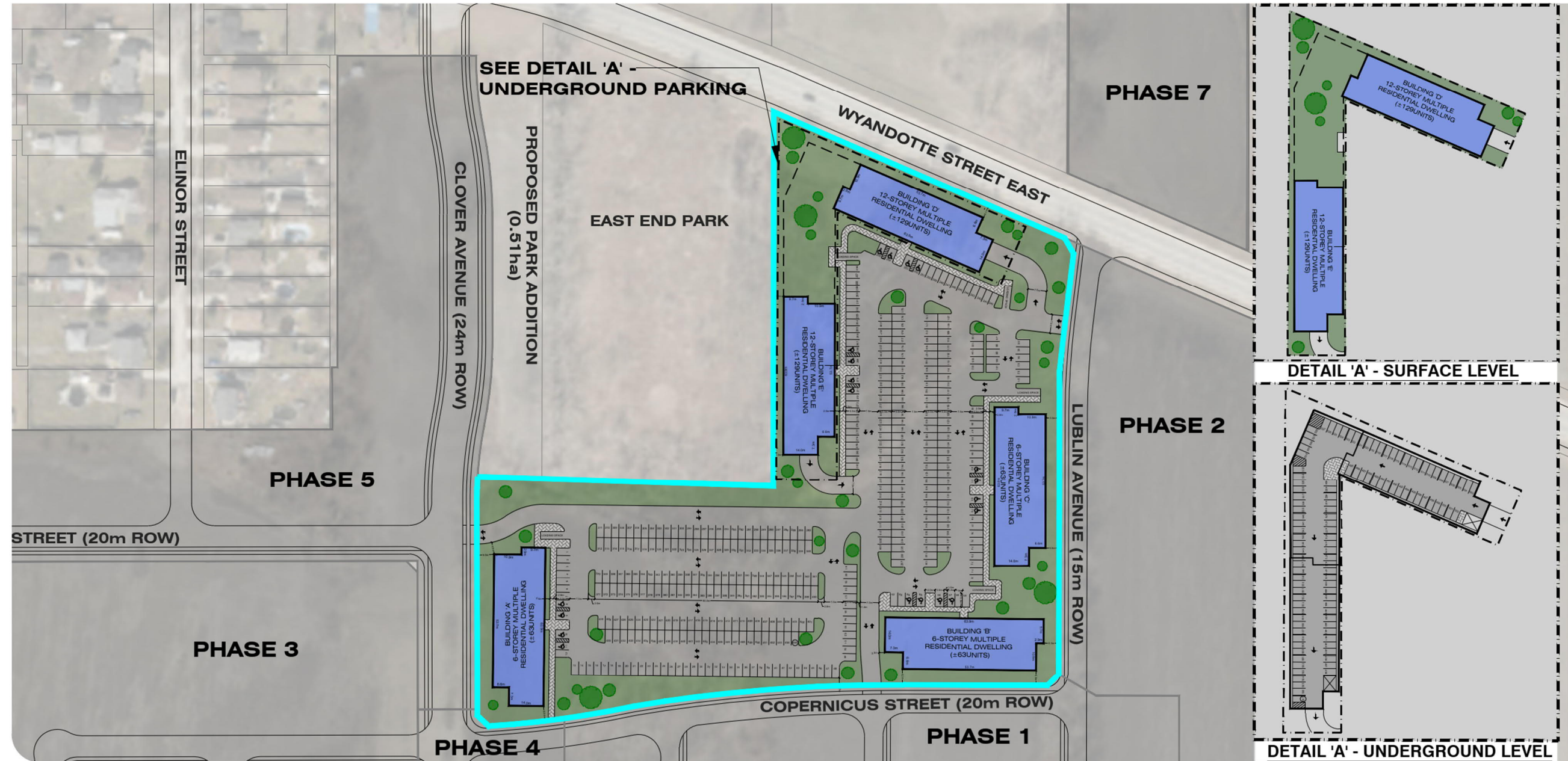
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# Appendix B

## Conceptual Development Plan – Phase 6

Figure 2: Concept Plan – Phase 6



**1027458 ONTARIO INC.**  
 EAST RIVERSIDE DEVELOPMENT  
 NORTH NEIGHBOURHOOD

**PHASE 6 -  
 CONCEPTUAL DEVELOPMENT PLAN  
 FIGURE 1.0**

|                                    |  |                             |                      |                      |
|------------------------------------|--|-----------------------------|----------------------|----------------------|
| SUBJECT AREA<br>PHASE 6 (± 3.48ha) | MULTIPLE DWELLING<br>RESIDENTIAL BUILDING<br>(447 UNITS) | PROPOSED<br>LANDSCAPED AREA | PROPOSED<br>SIDEWALK | PROPOSED<br>PAVEMENT |
|------------------------------------|--|-----------------------------|----------------------|----------------------|

|   |   |
|---|---|
| <b>PARKING STATISTICS</b>                           | <b>PHASE 6 - MULTI-UNIT RESIDENTIAL</b> |
| RESIDENTIAL REQUIREMENTS (1.25 SPACE PER UNIT): 559 | UNITS COUNT - 447 UNITS                 |
| ACCESSIBLE REQUIREMENTS (INCL.): 14                 | HEIGHT - 6 & 12 STOREYS                 |
| TOTAL PARKING REQUIRED: 480                         | PARKING SIZE - 3.0 m X 5.5m             |
| SURFACE PARKING PROVIDED: 455                       | <b>PROPOSED MINIMUM SETBACKS</b>        |
| COVERED PARKING PROVIDED: 112                       | FRONT YARD DEPTH - 5.5m                 |
| ACCESSIBLE PROVIDED: 20                             | BACK YARD DEPTH - 7.5m                  |
| TOTAL PARKING PROVIDED: 567                         | SIDE YARD DEPTH - 1.5m                  |
| PARKING RATE PROVIDED: 1.27 SPACES PER UNIT         |   |

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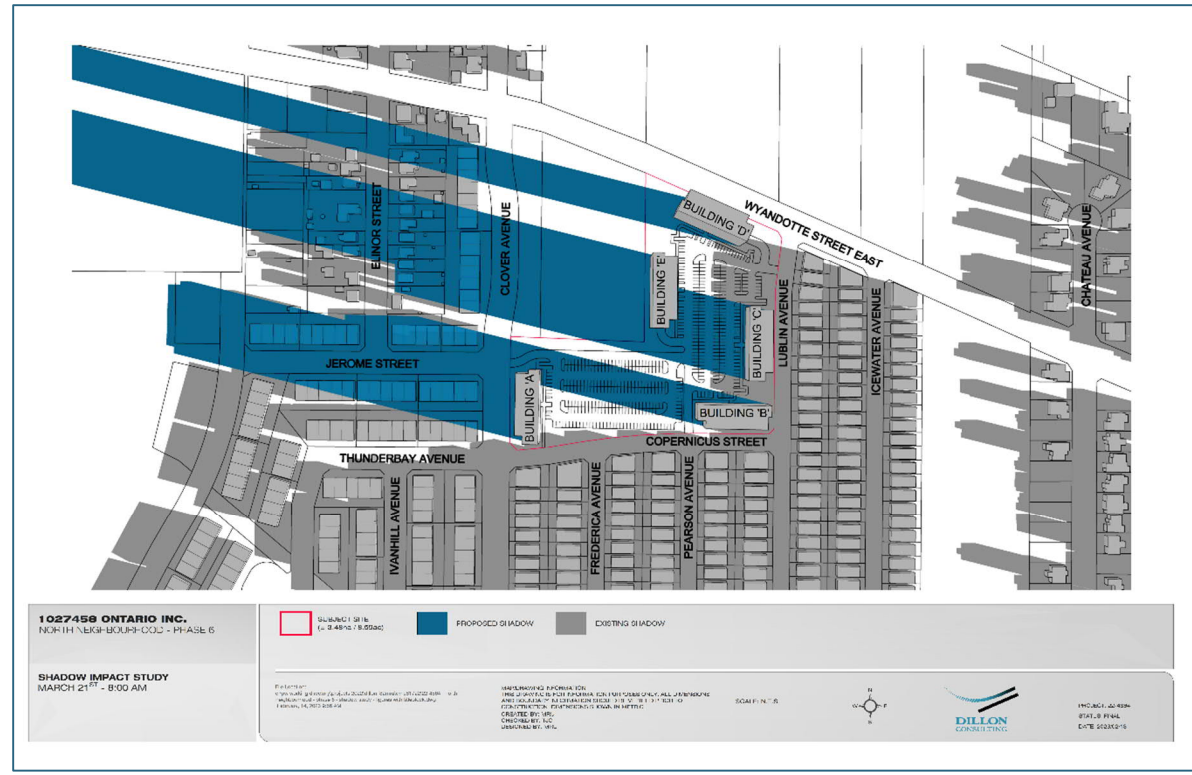
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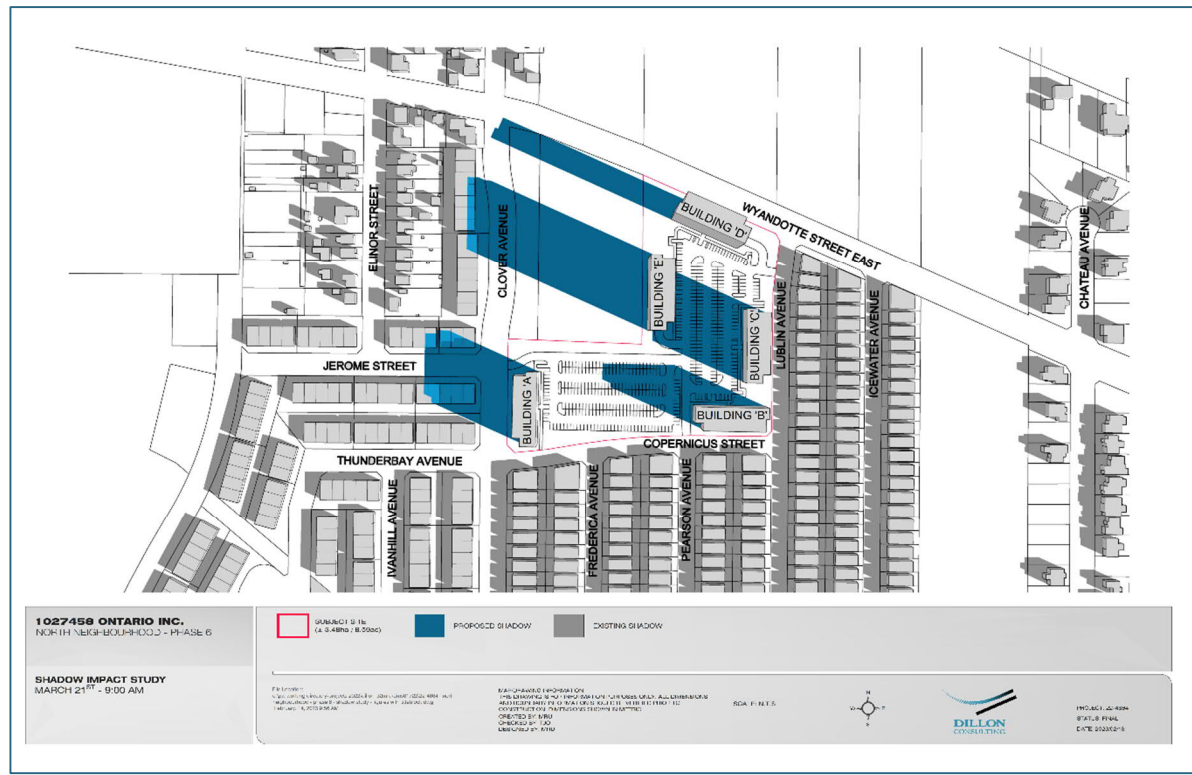
# Appendix C

## Shadow Diagrams: March 21

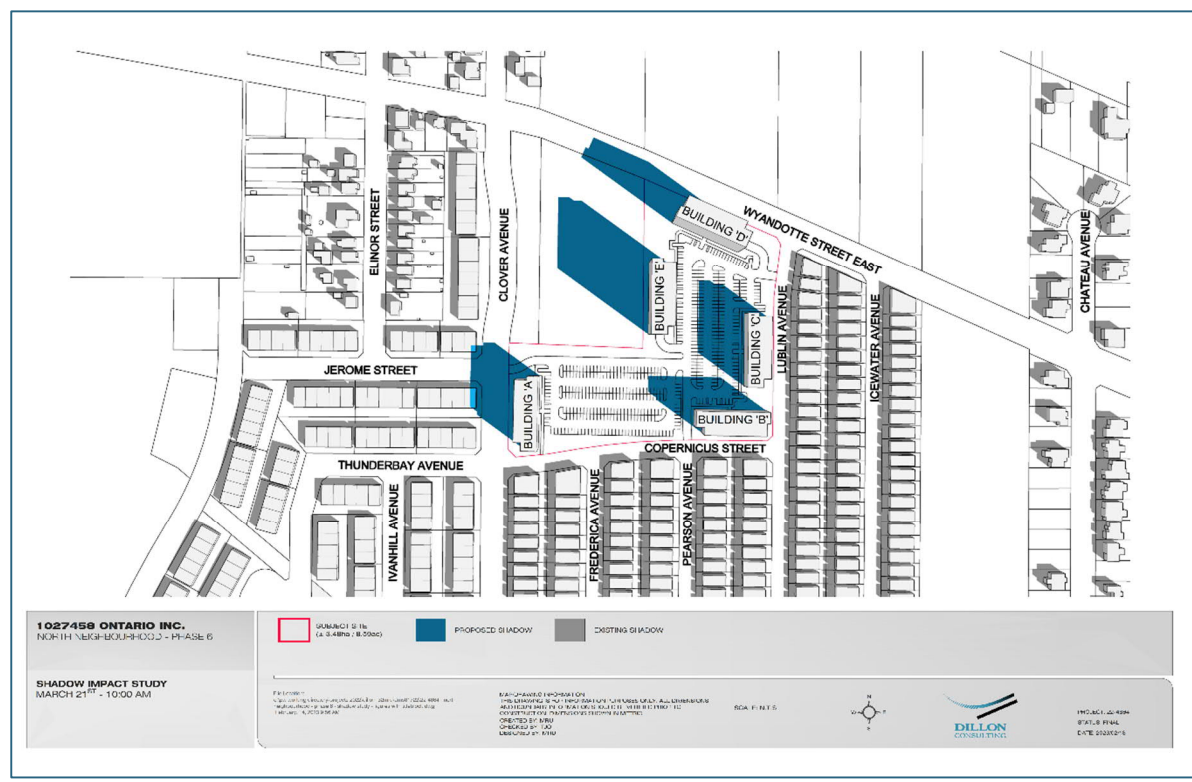




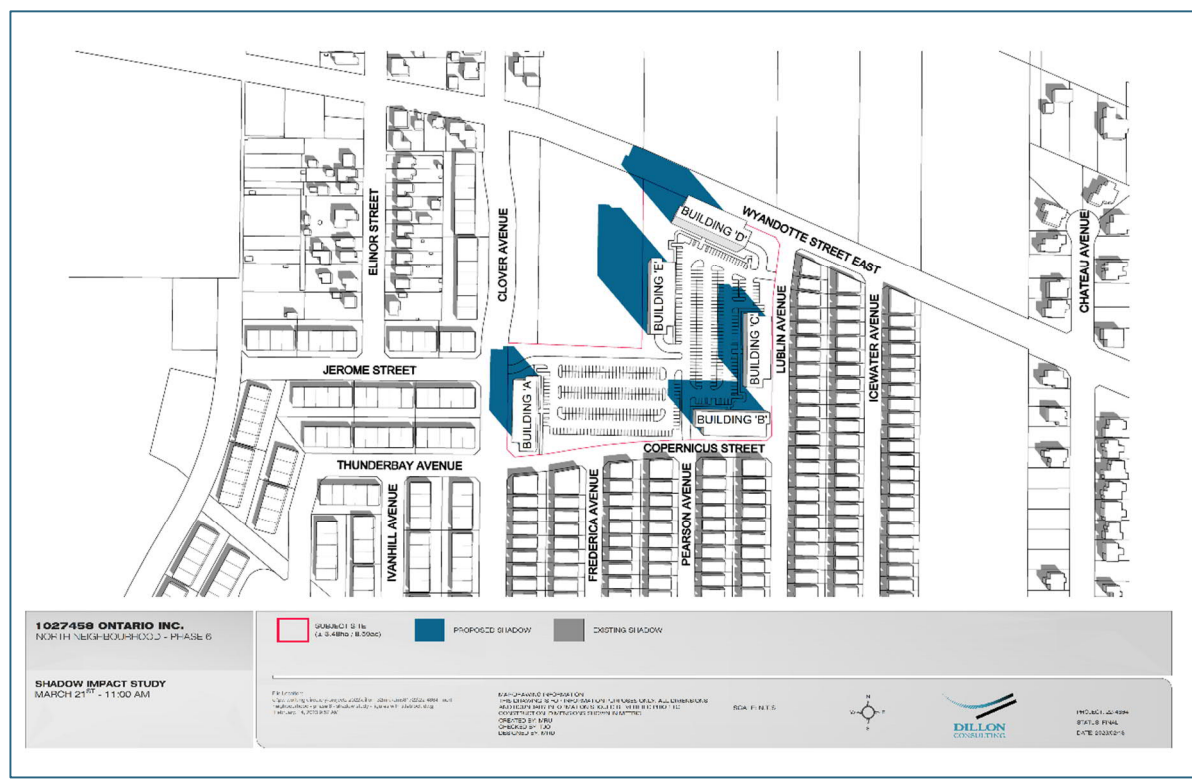
March 21 – 8:00 am



March 21 – 9:00 am

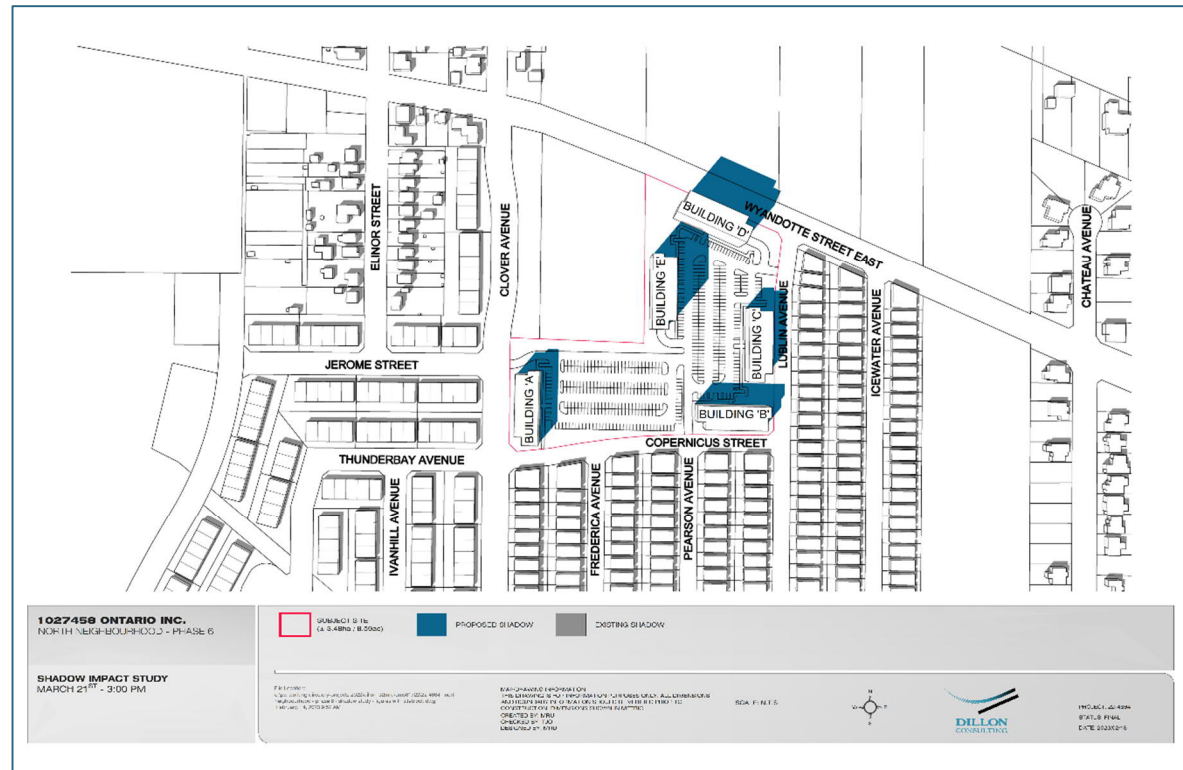


March 21 – 10:00 am

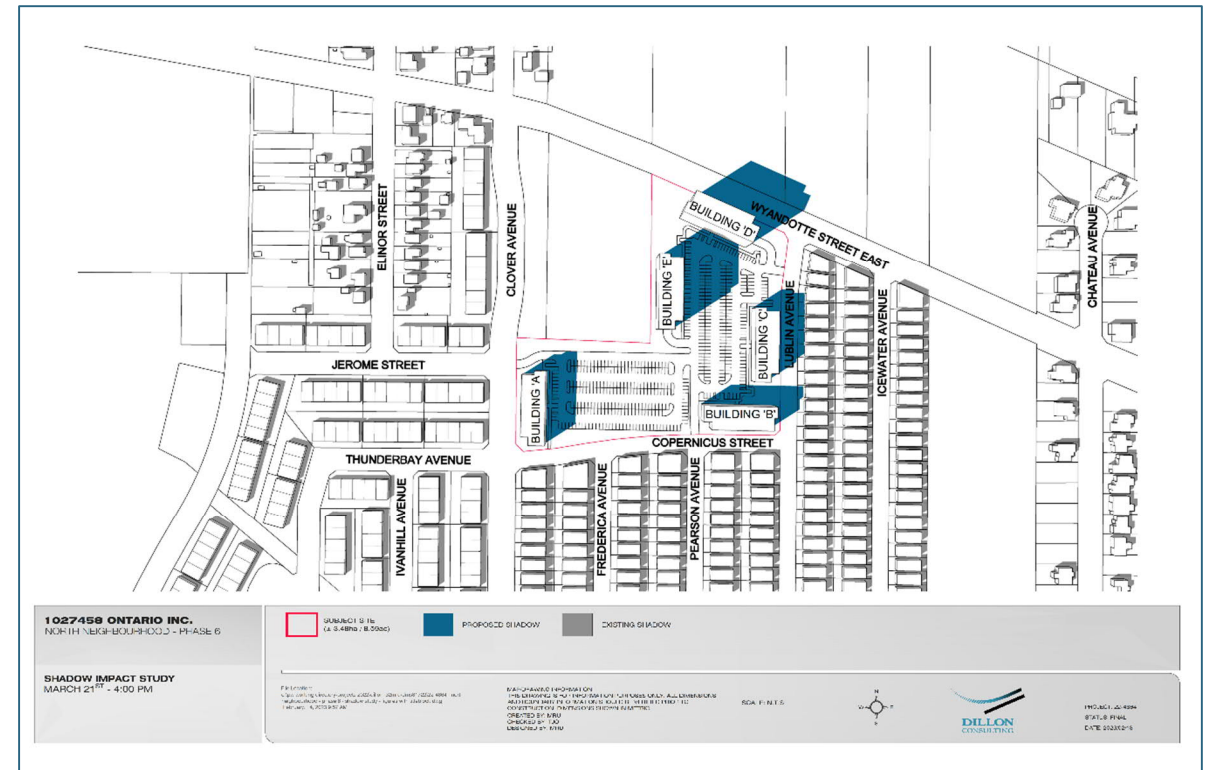


March 21 – 11:00 am

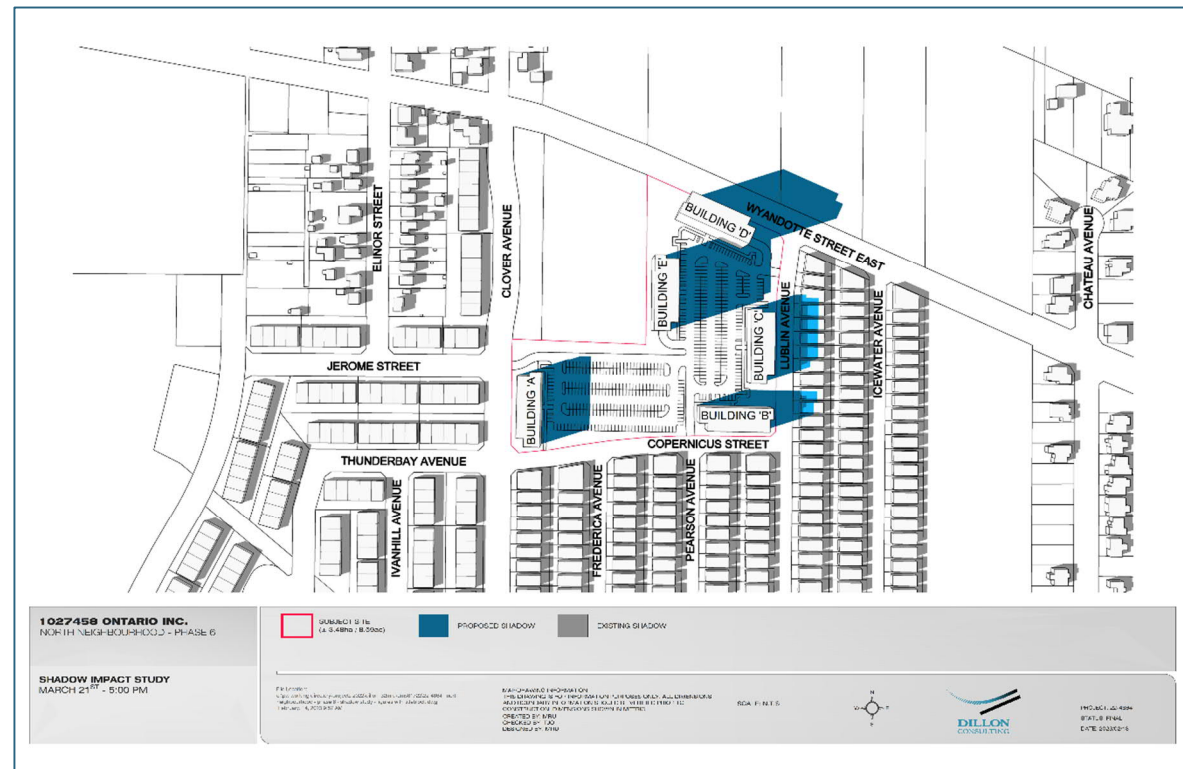




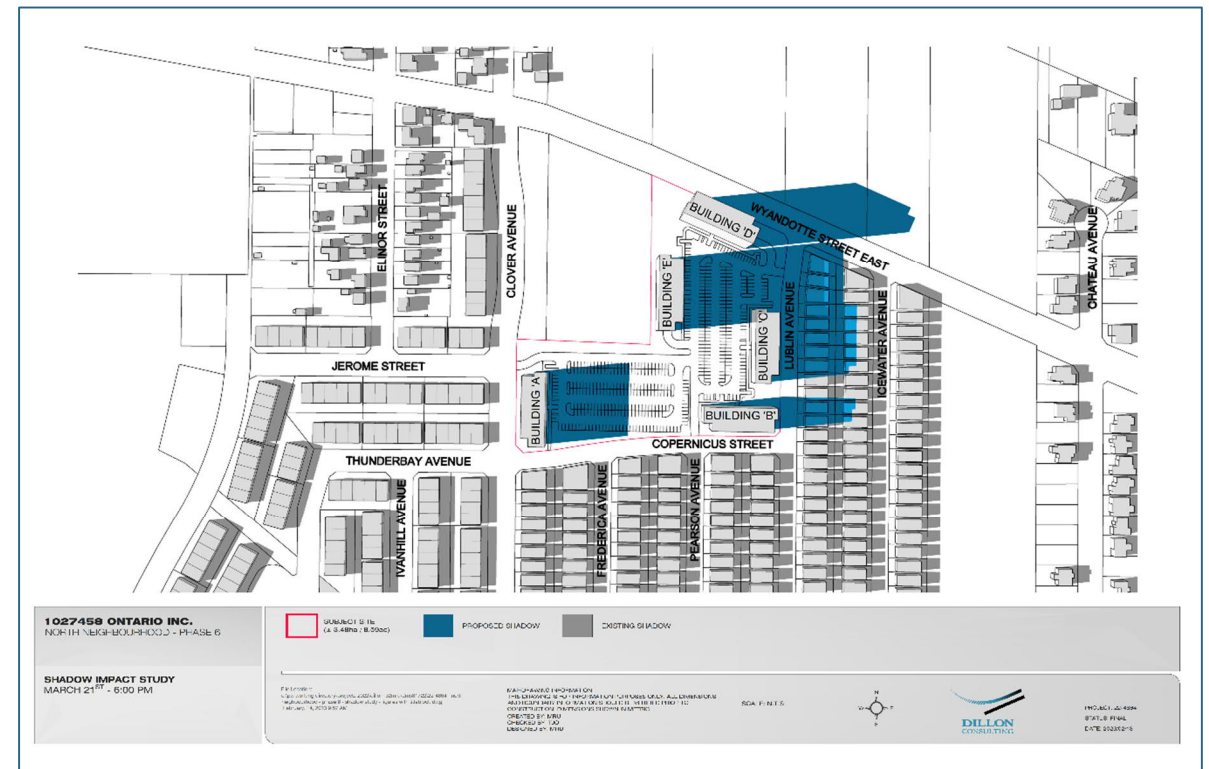
March 21 – 3:00 pm



March 21 – 4:00 pm



March 21 – 5:00 pm

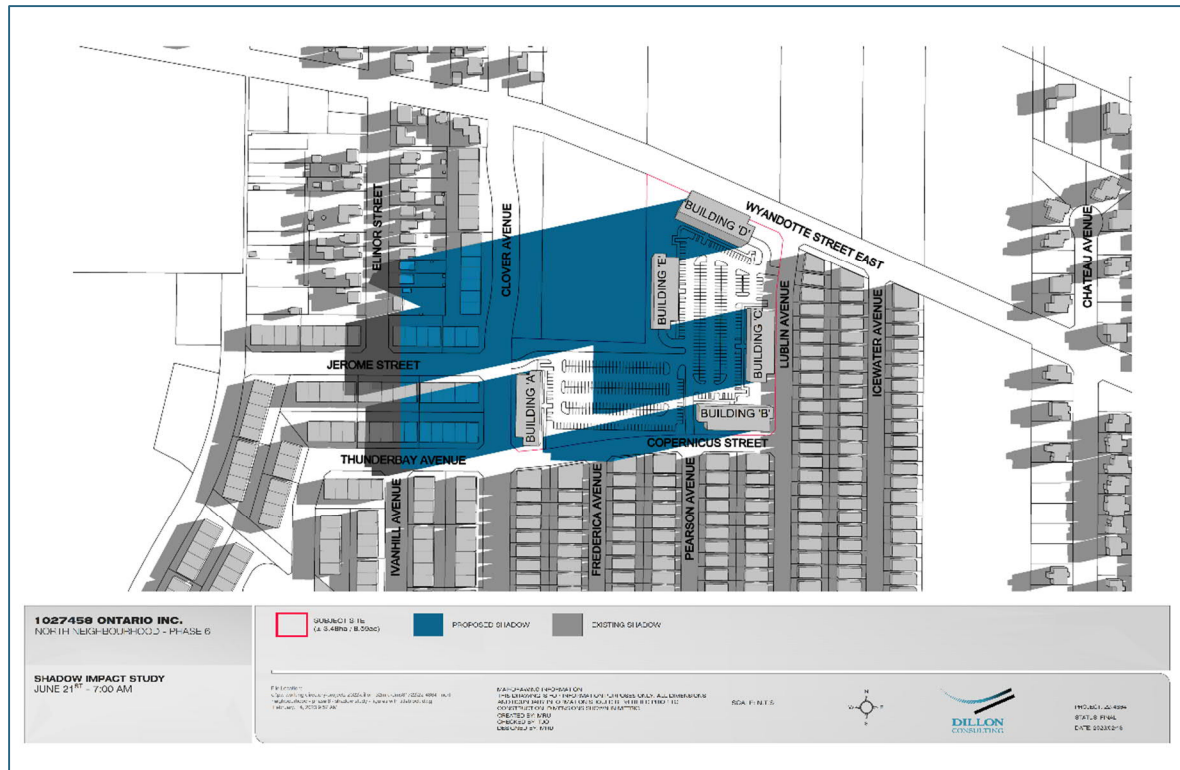


March 21 – 6:00 pm

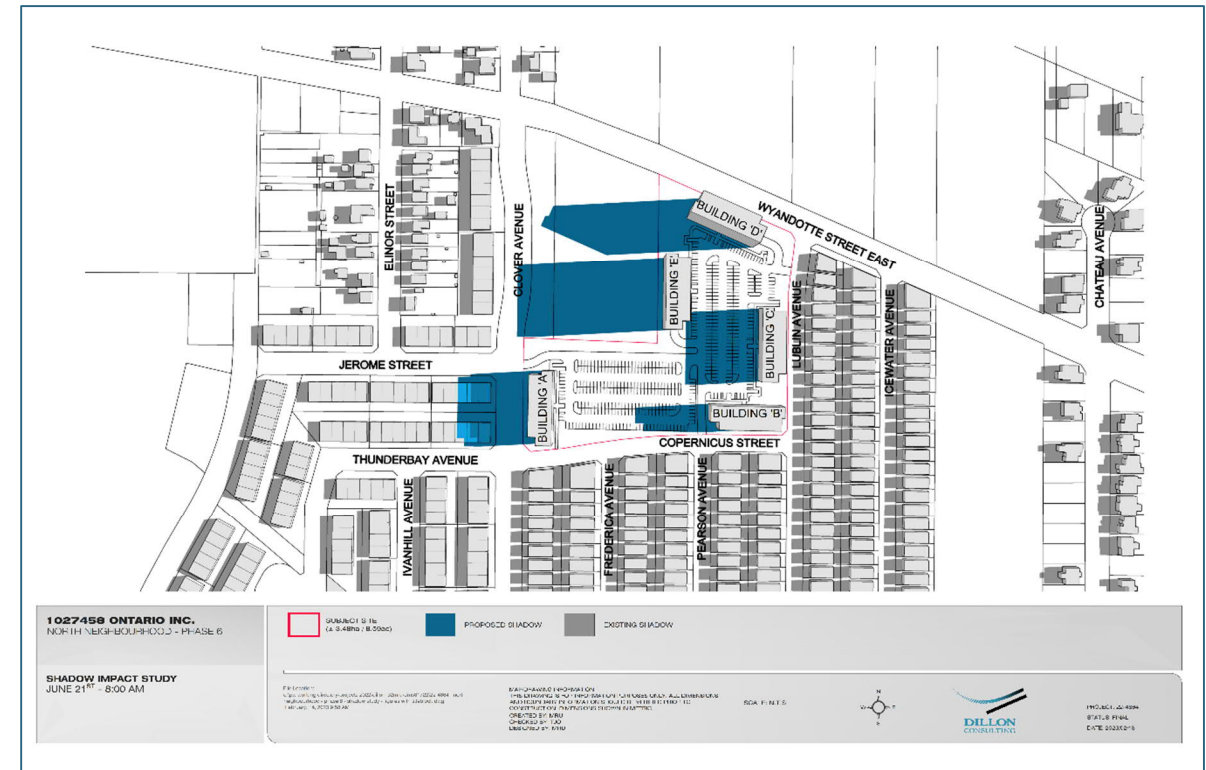
# Appendix D

## Shadow Diagrams: June 21

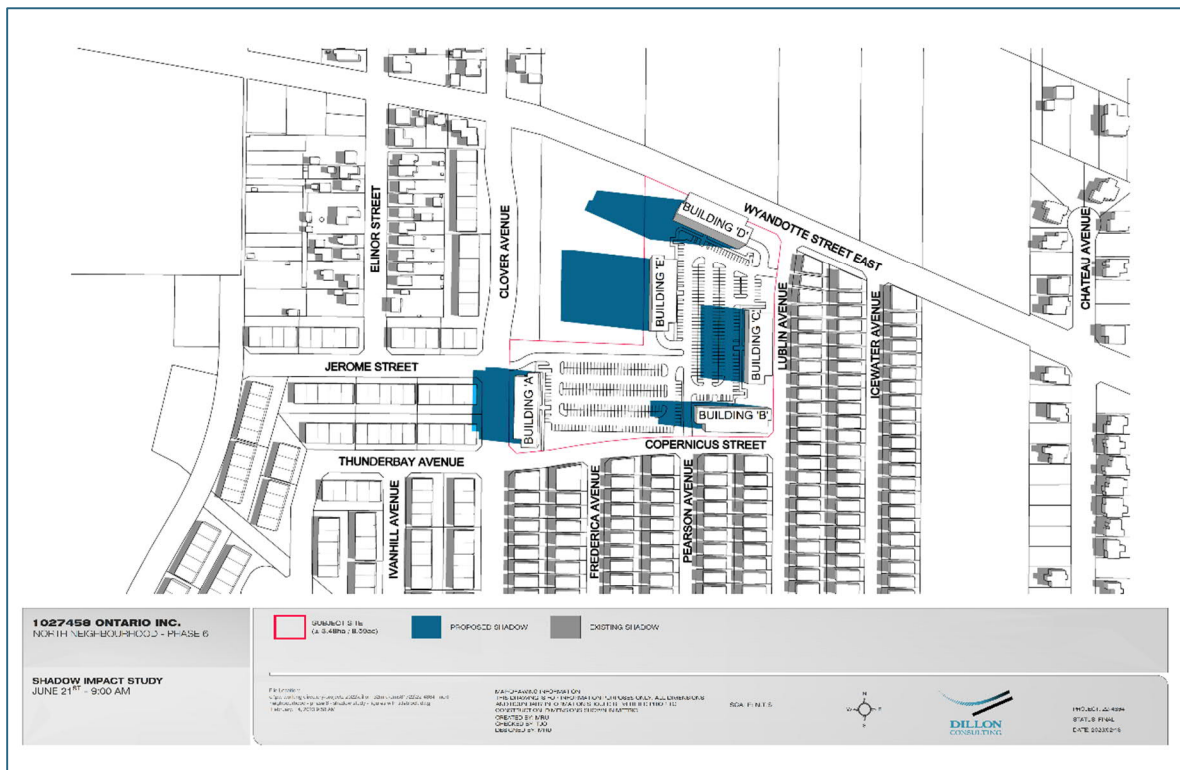




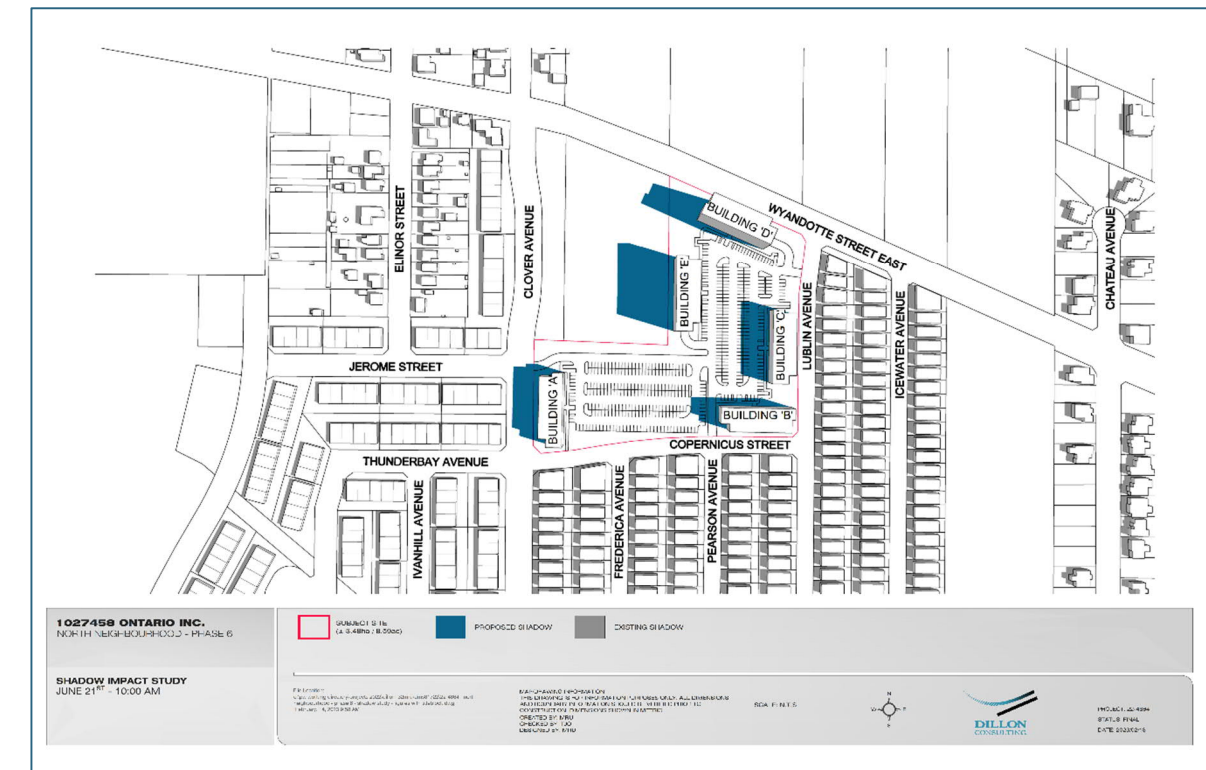
June 21 - 7:00 am



June 21 - 8:00 am

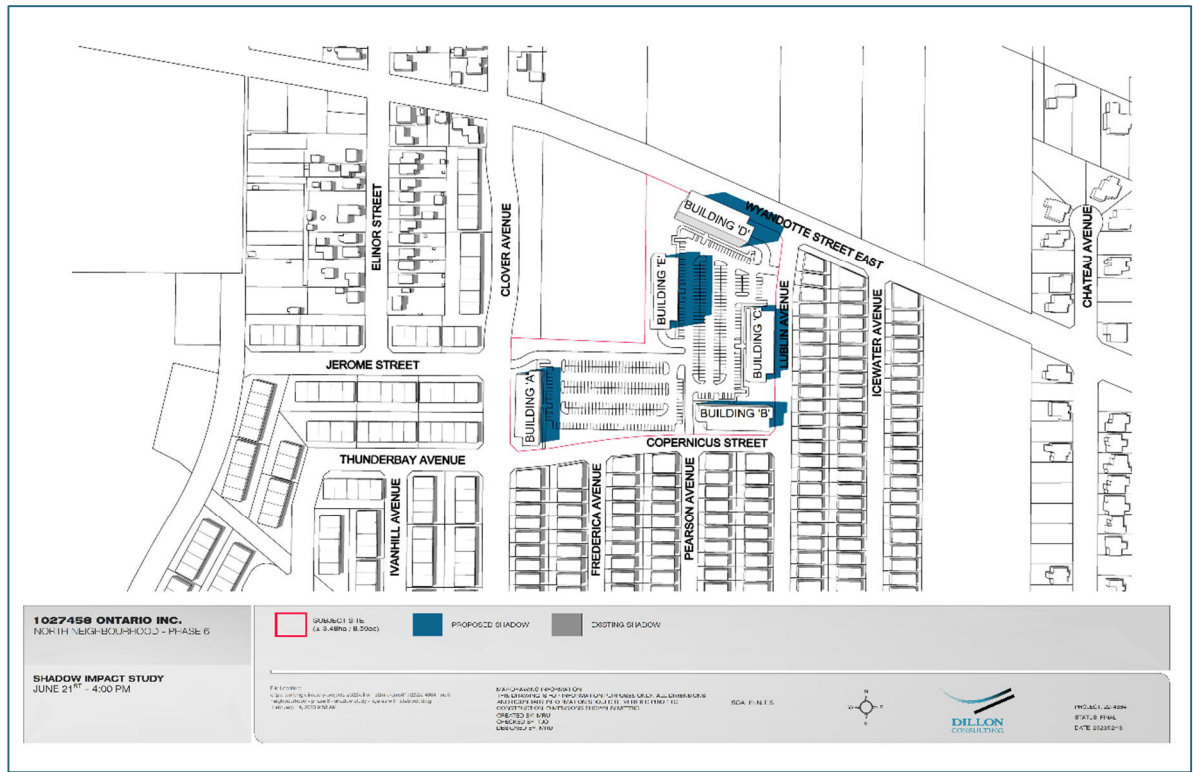


June 21 - 9:00 am

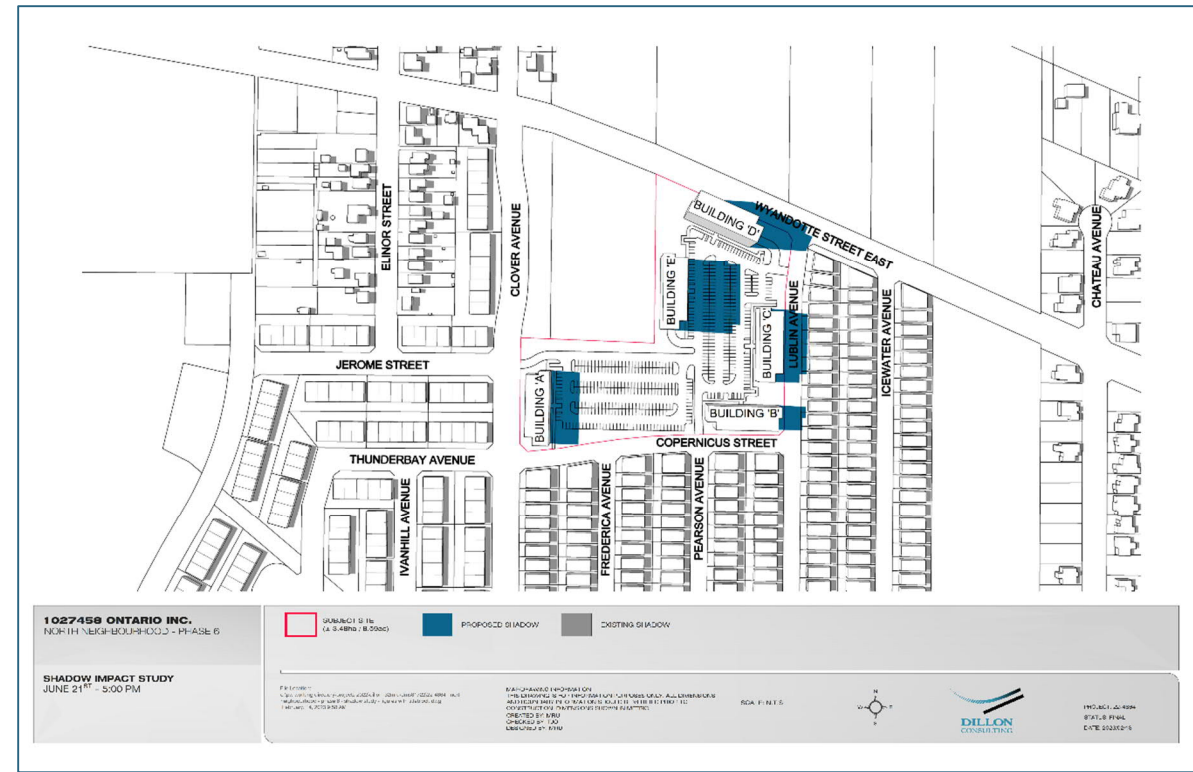


June 21 - 10:00 am

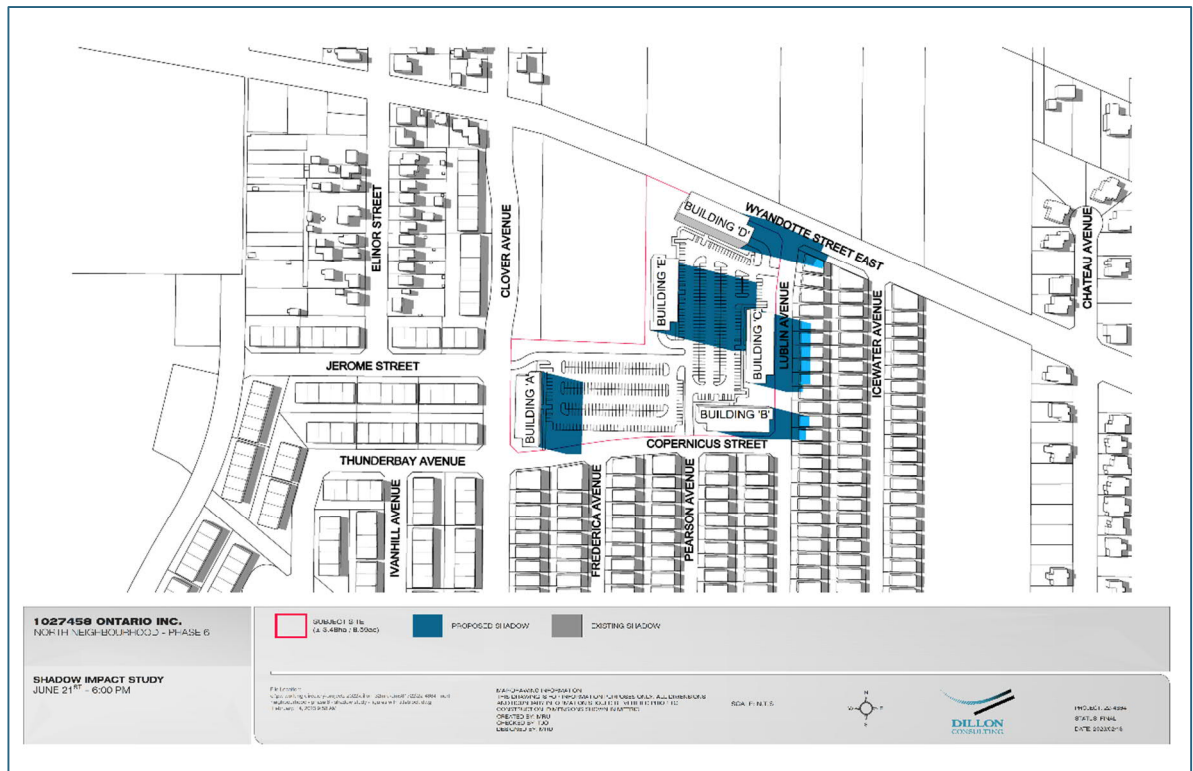




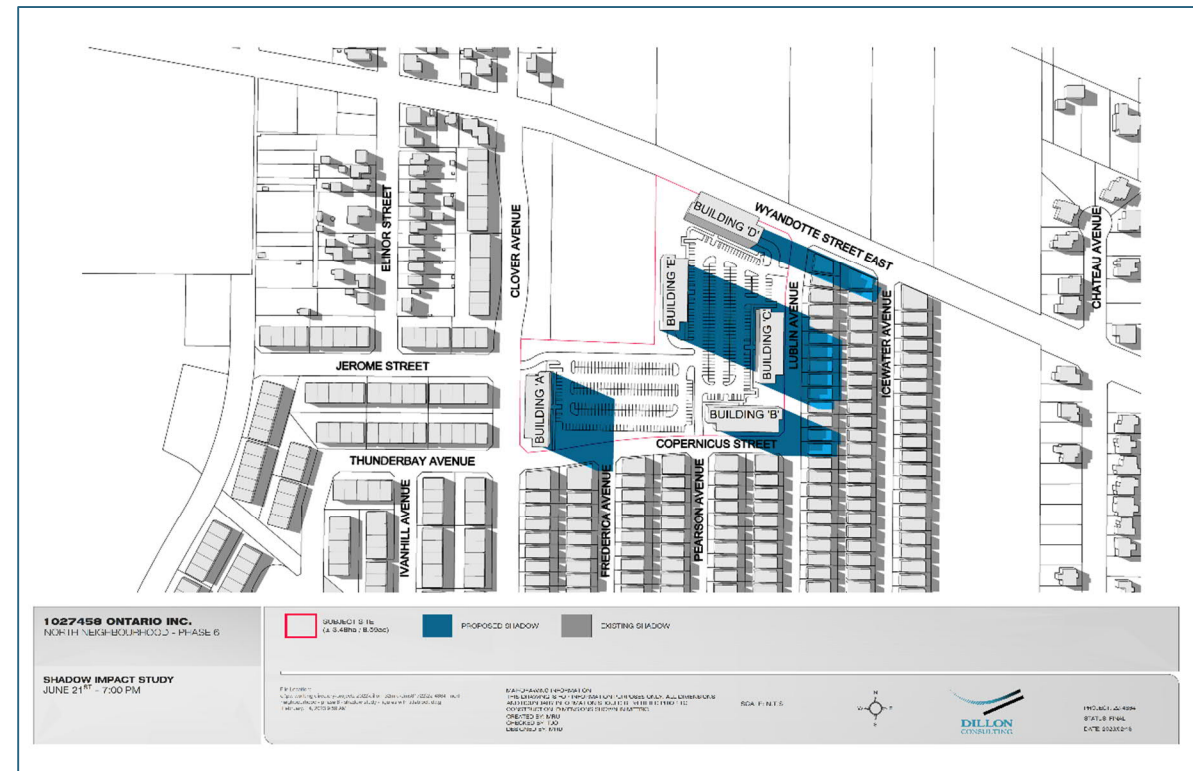
June 21 - 4:00 pm



June 21 - 5:00 pm



June 21 - 6:00 pm

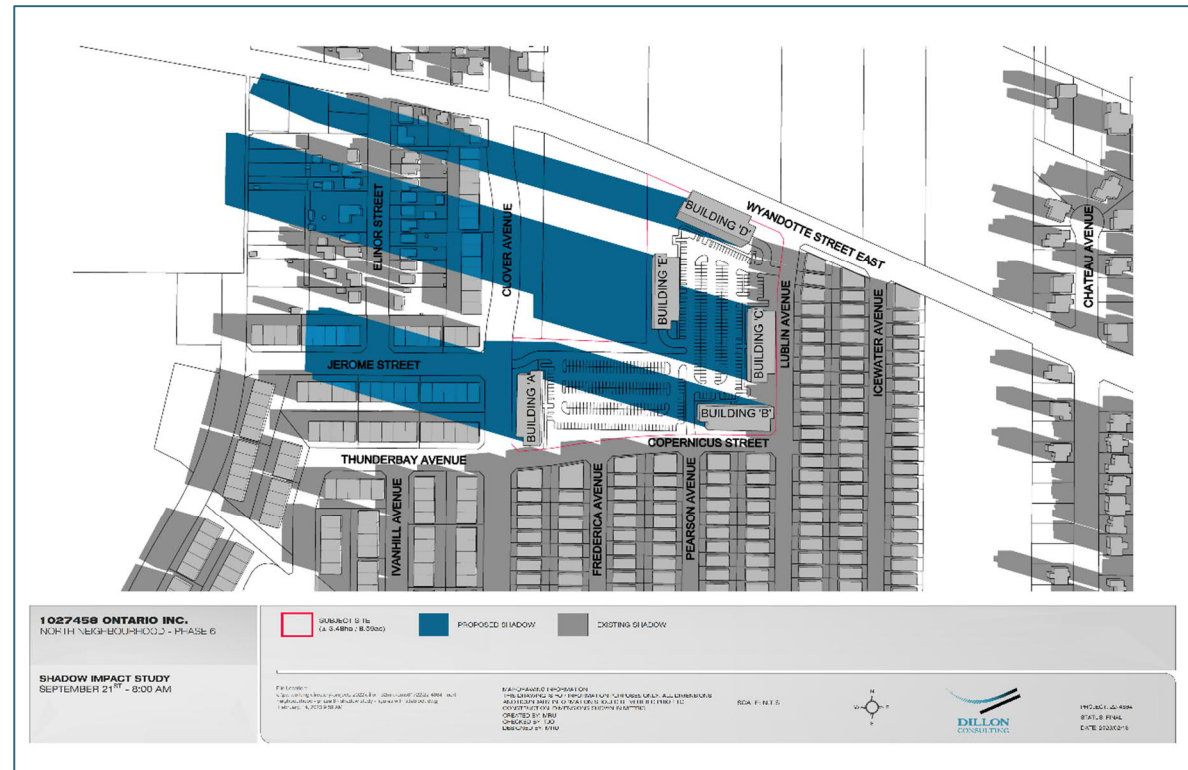


June 21 - 7:00 pm

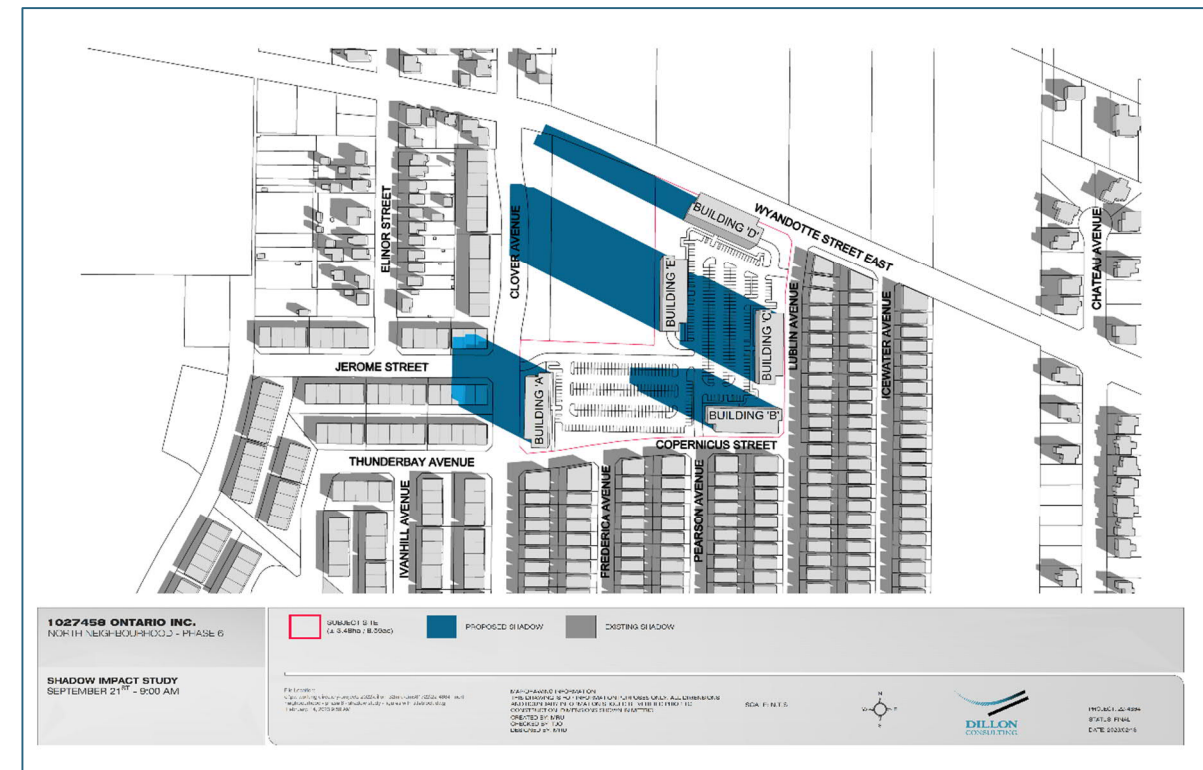
# Appendix E

## Shadow Diagrams: September 21

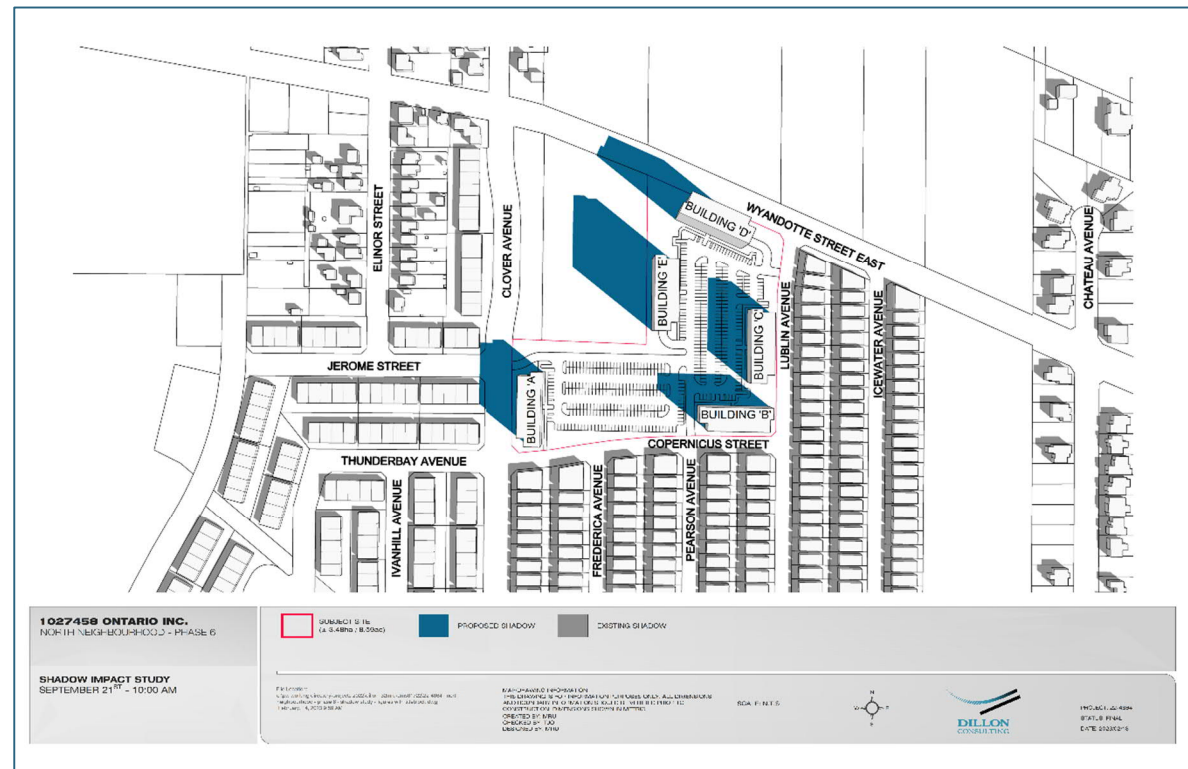




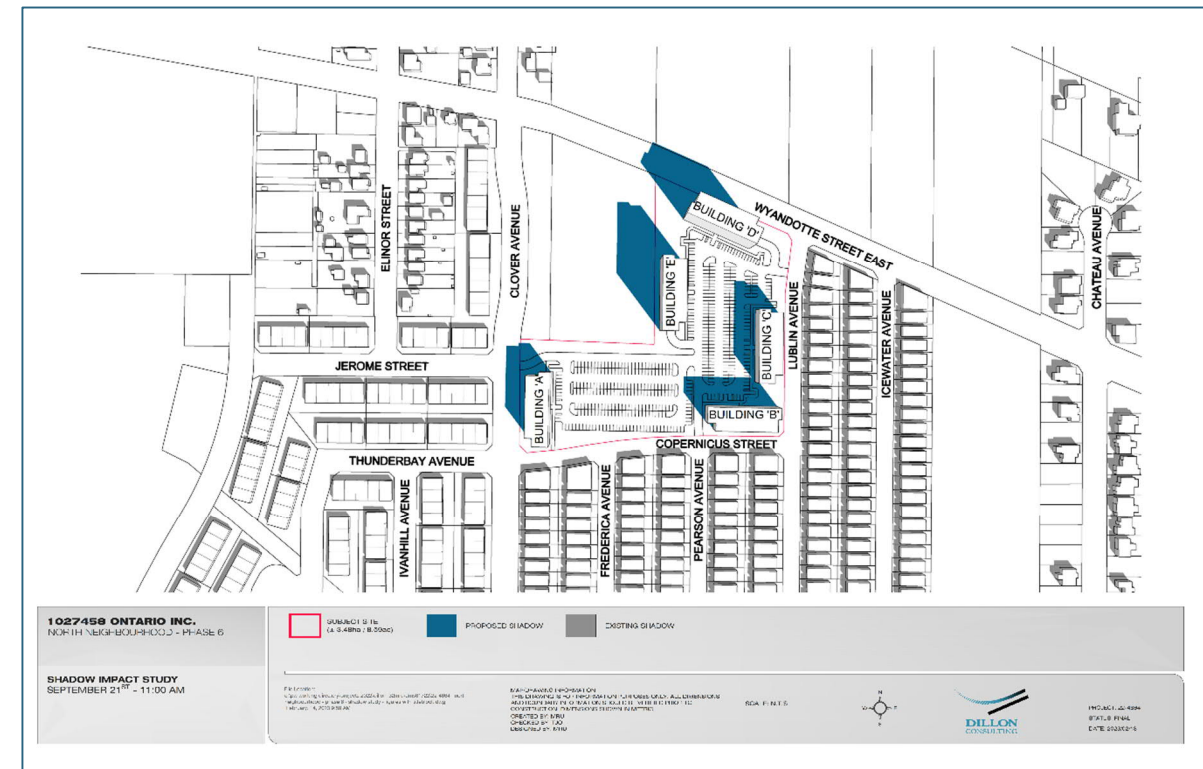
September 21 – 8:00 am



September 21 – 9:00 am

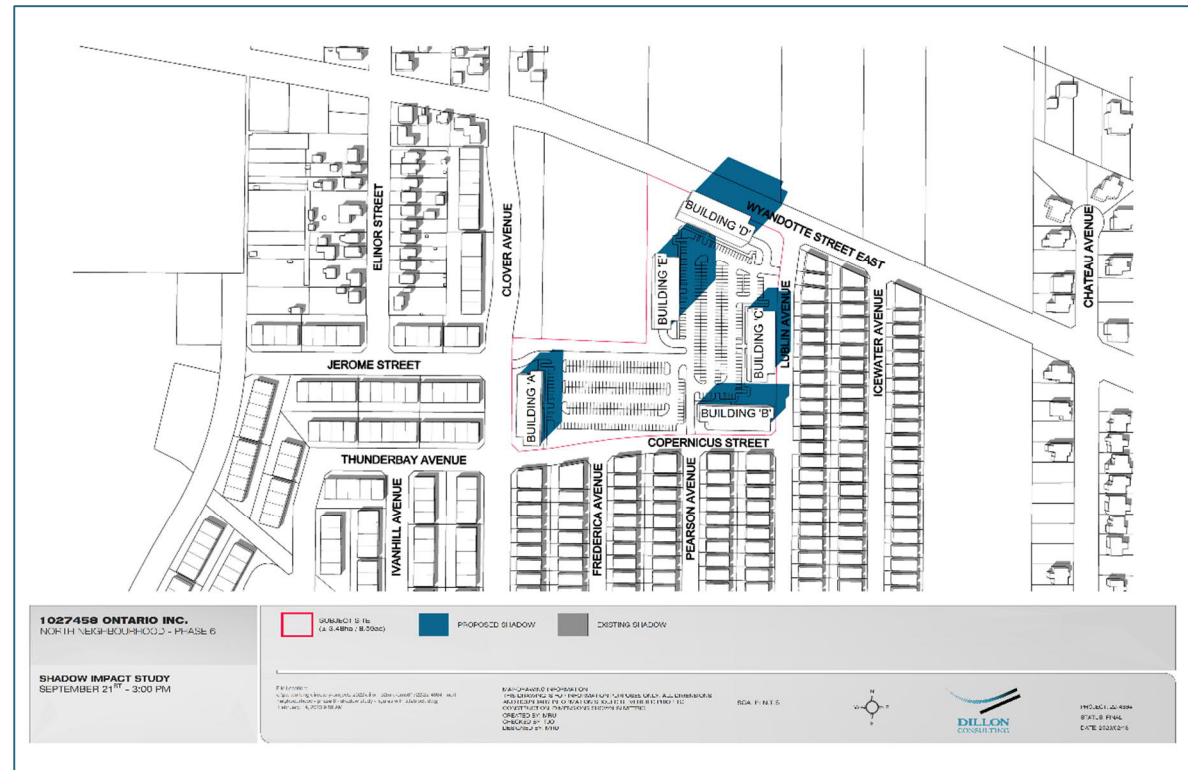


September 21 – 10:00 am

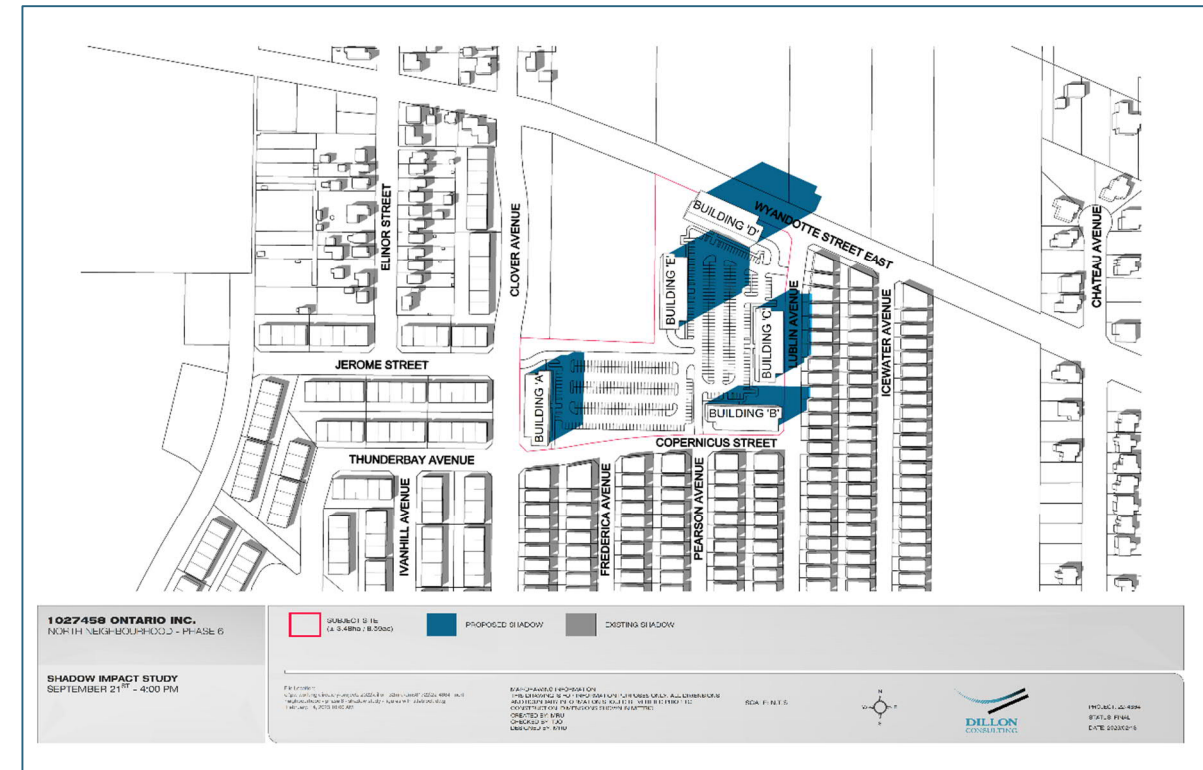


September 21 – 11:00 am

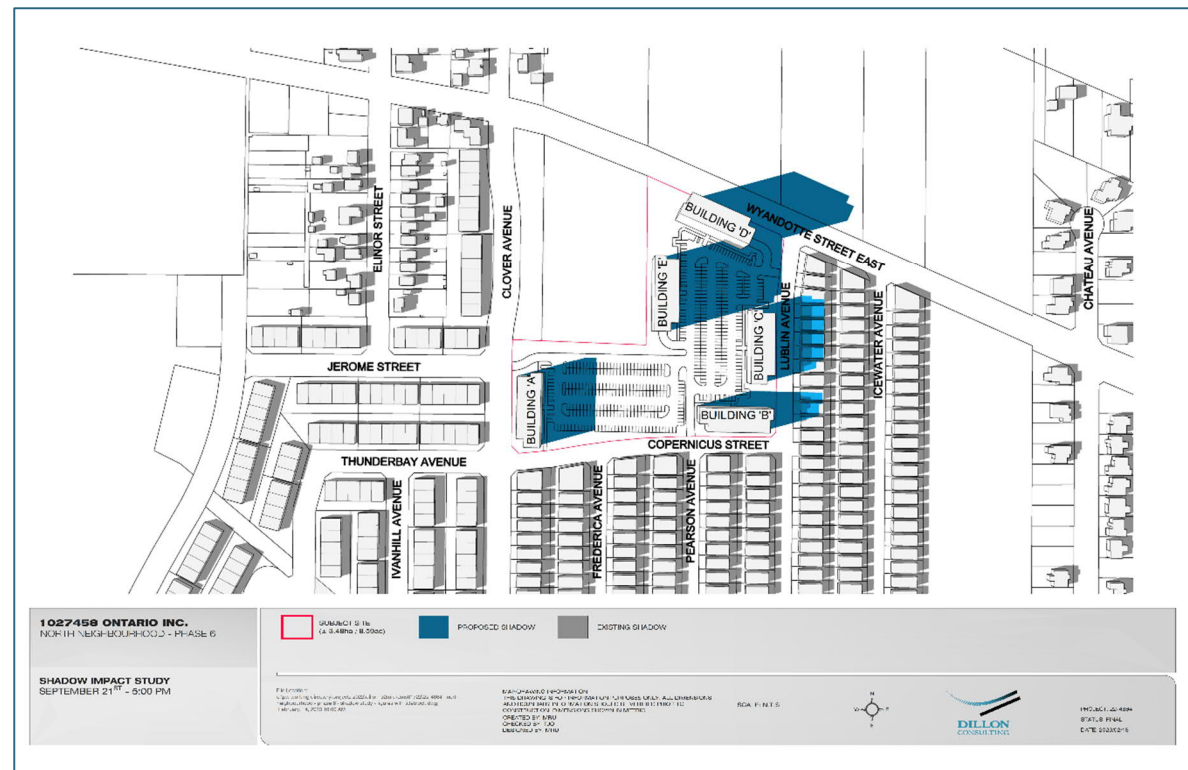




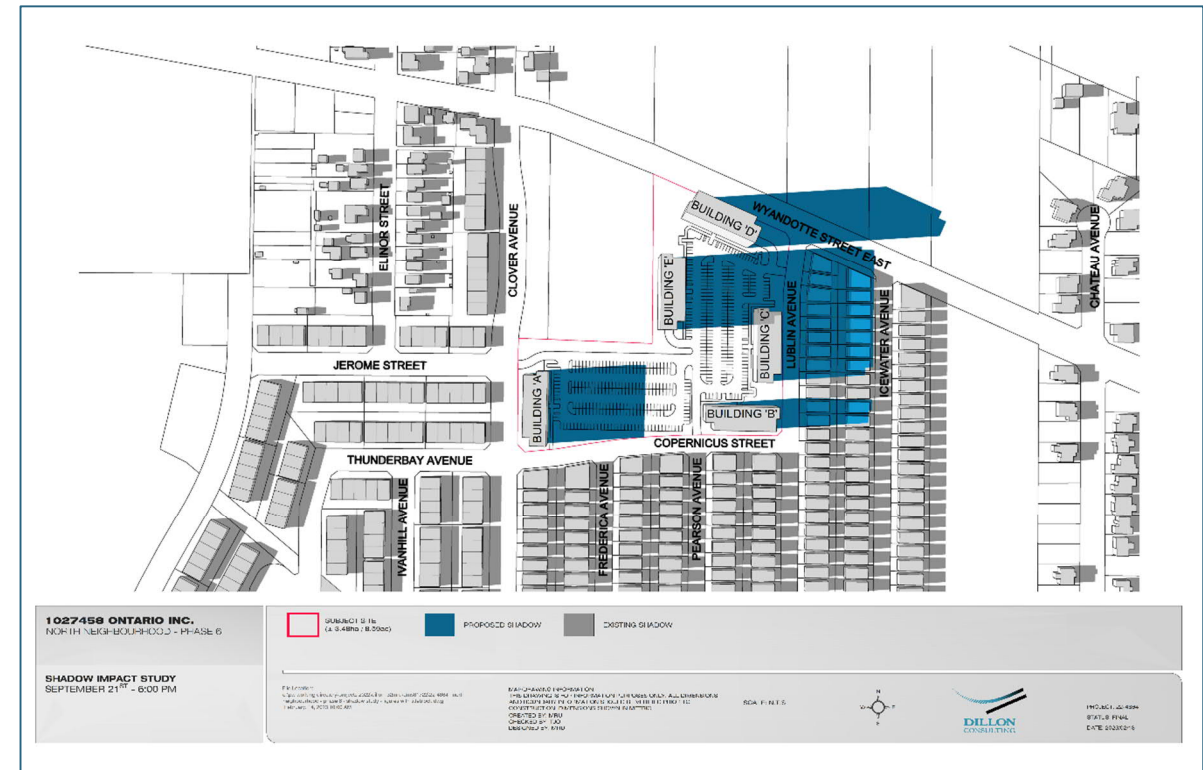
September 21 – 3:00 pm



September 21 – 4:00 pm



September 21 – 5:00 pm

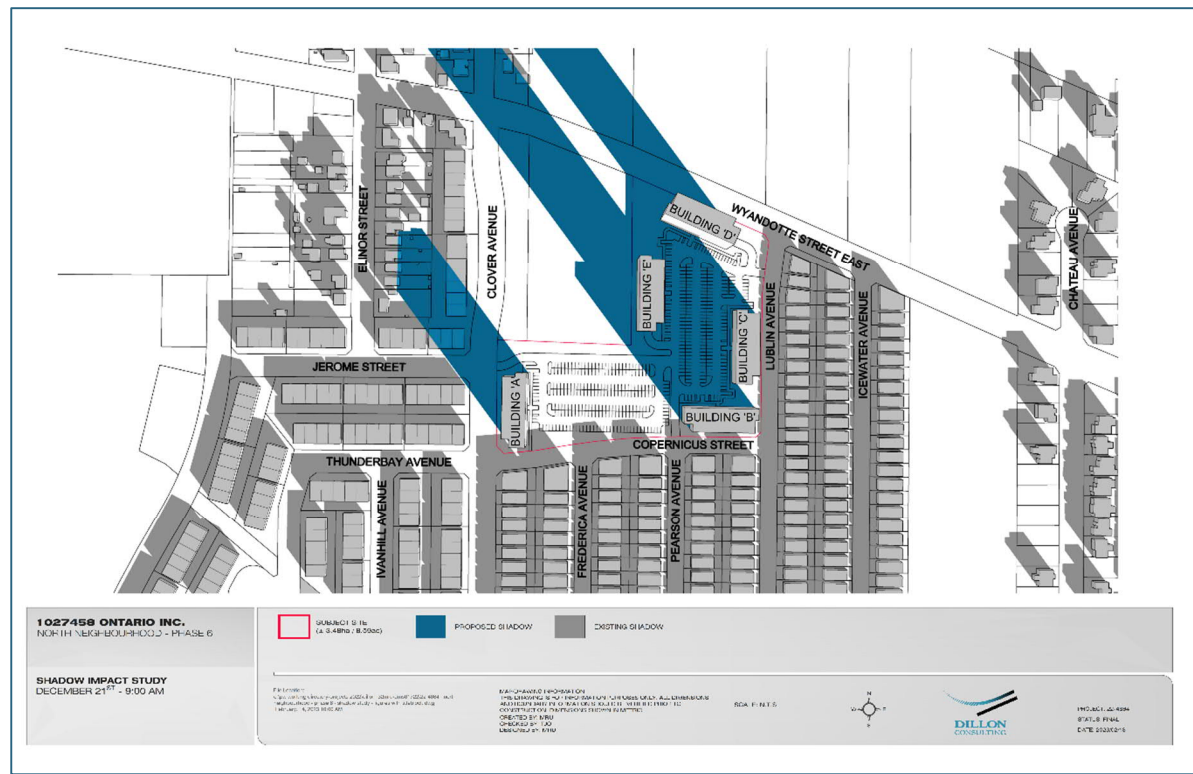


September 21 – 6:00 pm

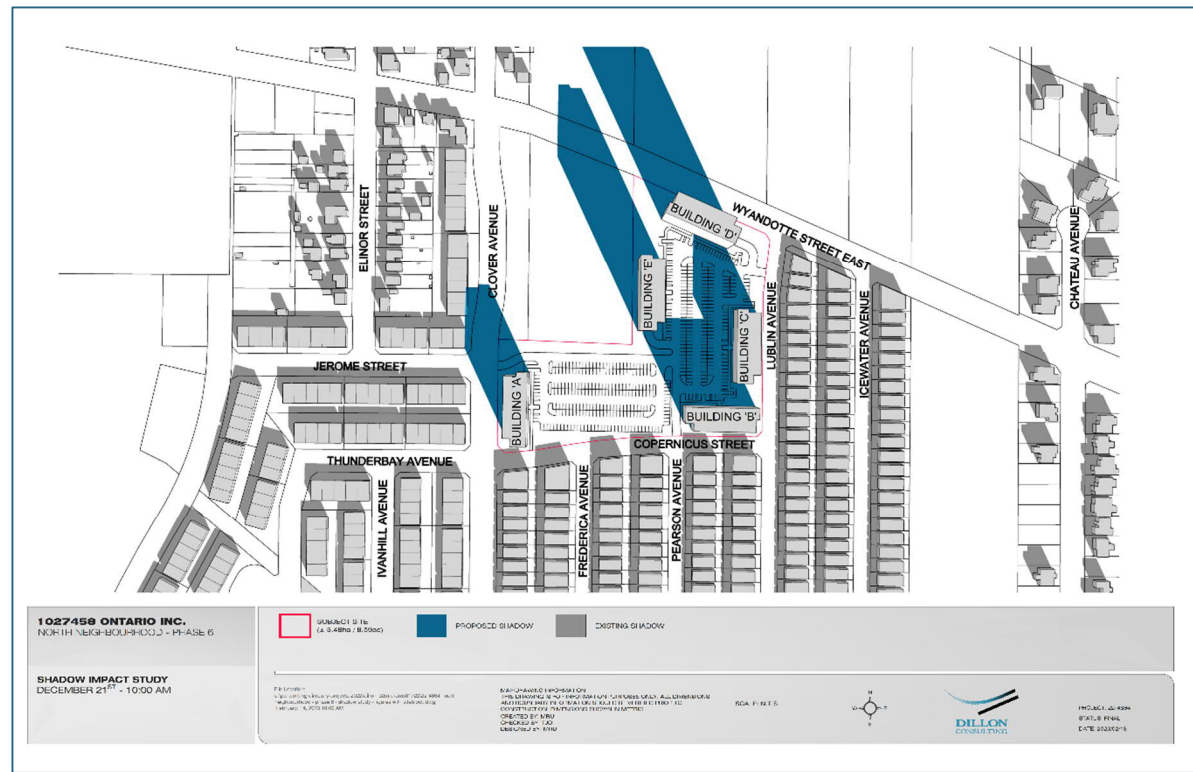
# Appendix F

## Shadow Diagrams: December 21

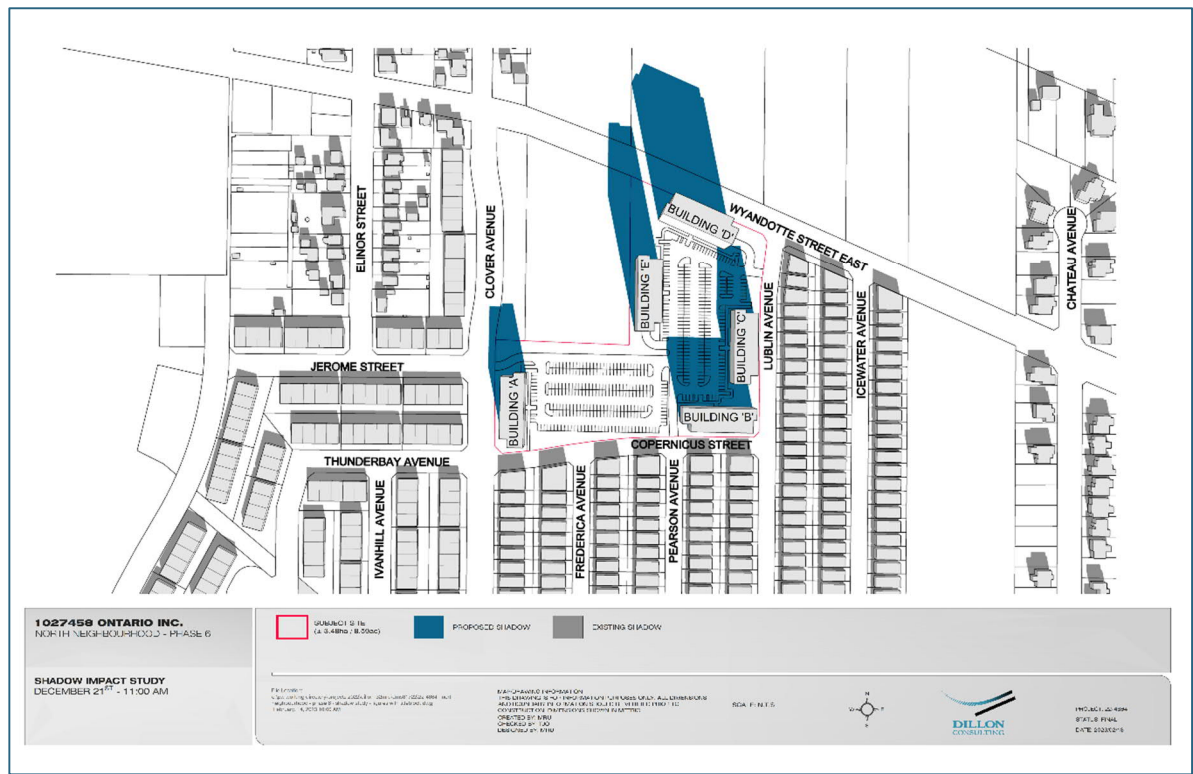




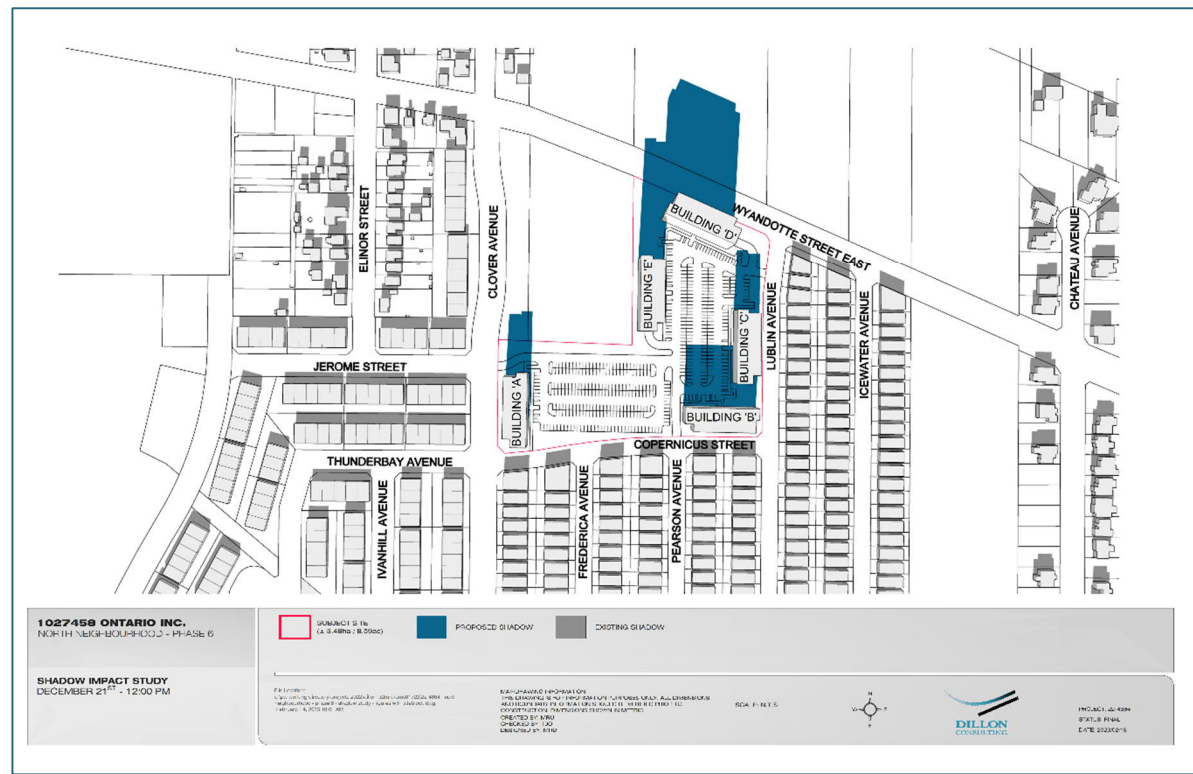
December 21 - 9:00 am



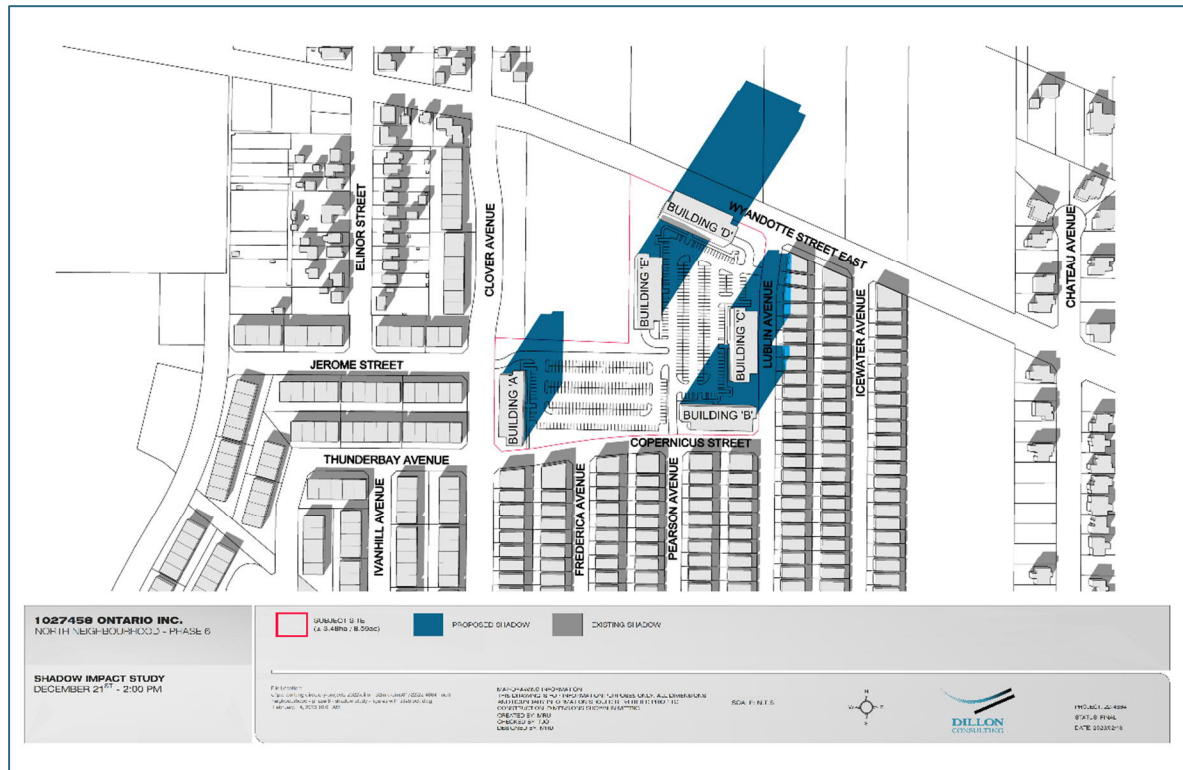
December 21 - 10:00 am



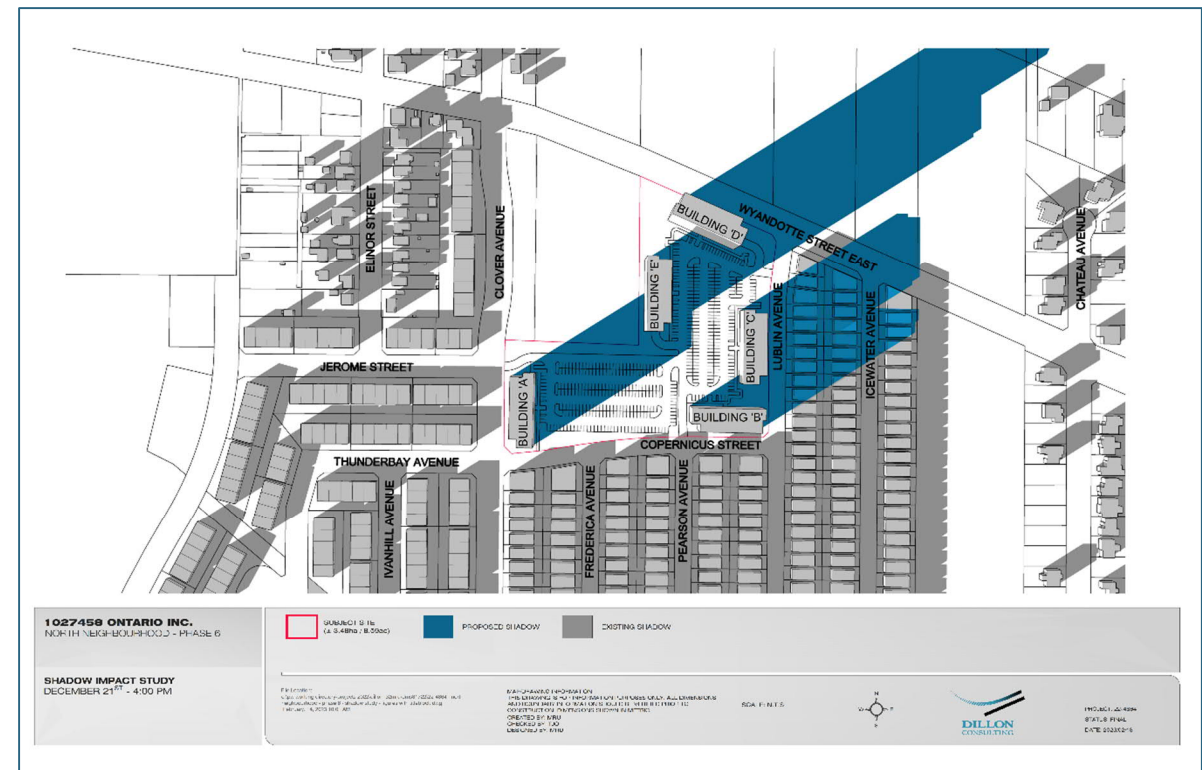
December 21 - 11:00 am



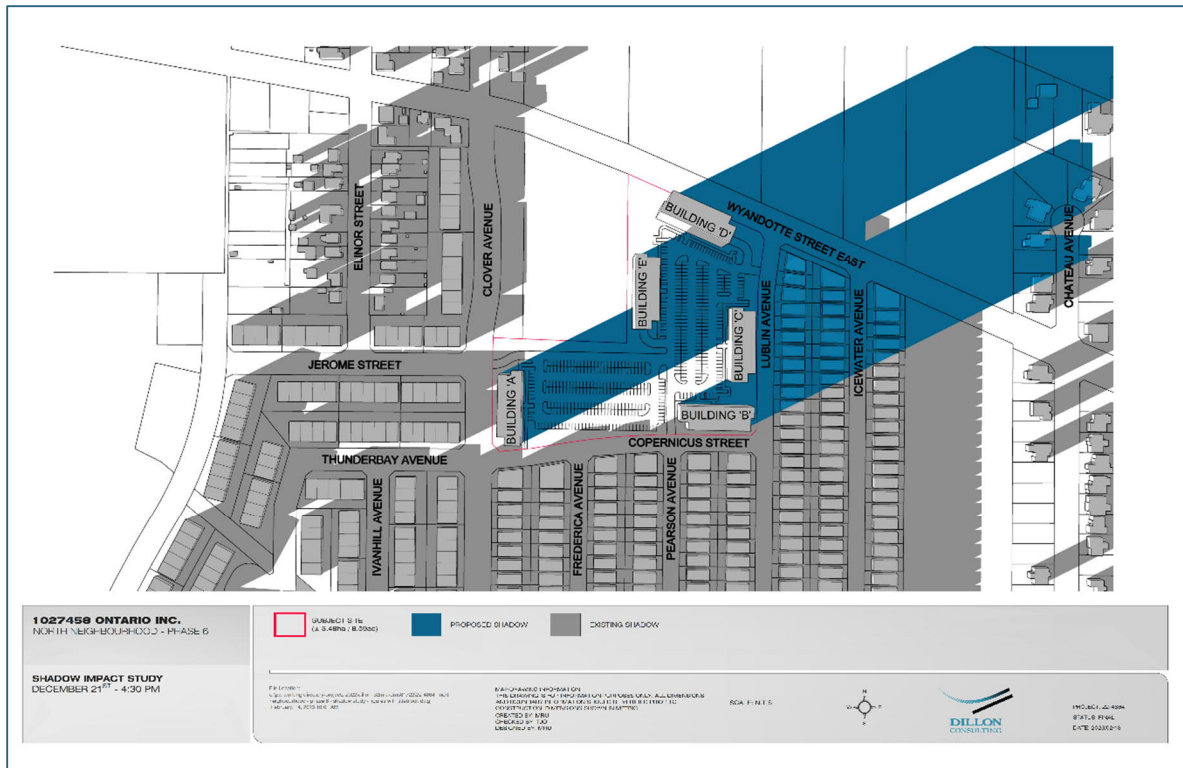
December 21 - 12:00 pm



December 21 – 2:00 pm



December 21 – 4:00 pm



December 21 – 4:30 pm