SUPPLEMENTARY SUBMISSION: OVERSHADOWING IMPACTS ASSESSMENT

PLANNING PROPOSAL AT 44-78 ROSEHILL ST, REDFERN

JUNE 2018

IMPACT ON PUBLIC OPEN SPACE

IMPACT ON RESIDENTIAL BUILDINGS

RD great places

IMPACT ON PUBLIC SPACE

GIBBONS STREET RESERVE

Observation:

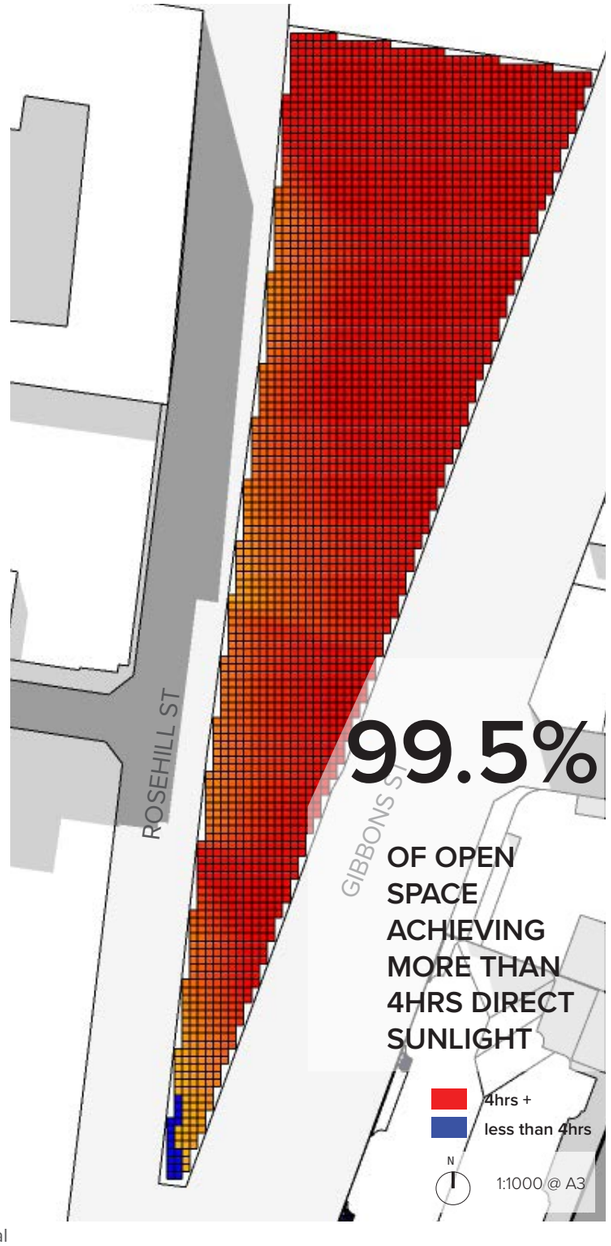
The proposal has a minor impact on the southern corner of Gibbons Place. Due to its geometry and proximity to a vehicle-dominated intersection, the southern corner has little benefit for use by the public.

Overall, Gibbons Place complies with the CoS solar amenity standard for the public places.

Gibbons Street Reserve Aerial View

Shadow Assessment Existing

Shadow Assessment Proposed



*Solar insulation analysis generated at 5 min intervals, in a scale at 1h interval

IMPACT ON PUBLIC SPACE

DANIEL DAWSON PLAYGROUND

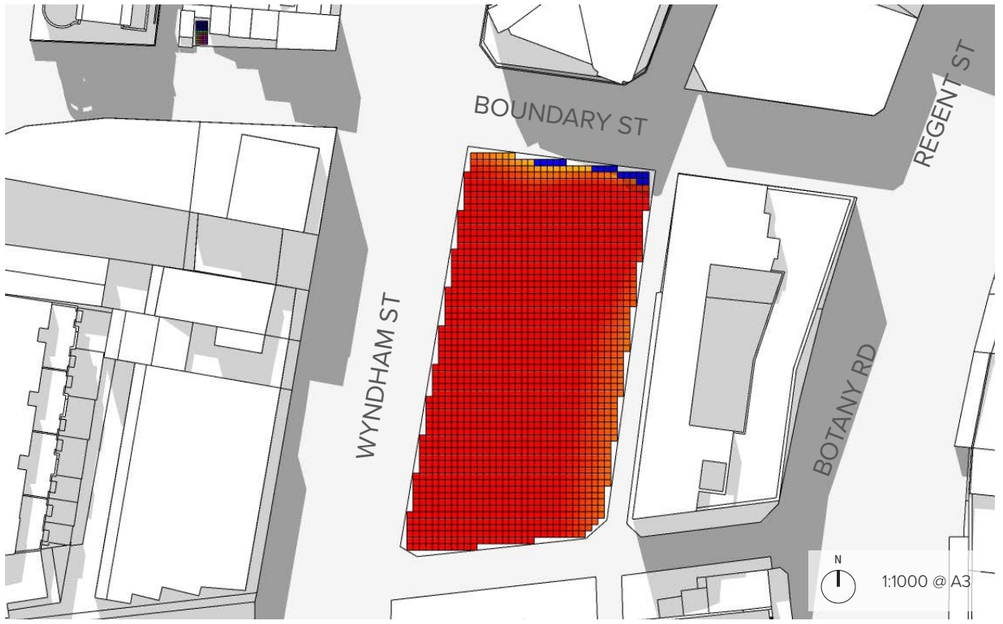
Observation:

The proposal does have an impact on the northern portion of Daniel Dawson Playground. However, the Playground still complies with the Cos solar amenity standard for public places with over 50% of the place receiving more than 4hrs of sunlight providing opportunities for users to benefit from a variety of daylight conditions.

Overall the space complies the Cos solar amenity standard.

Daniel Dawson Playground Aerial View

Shadow Assessment Existing



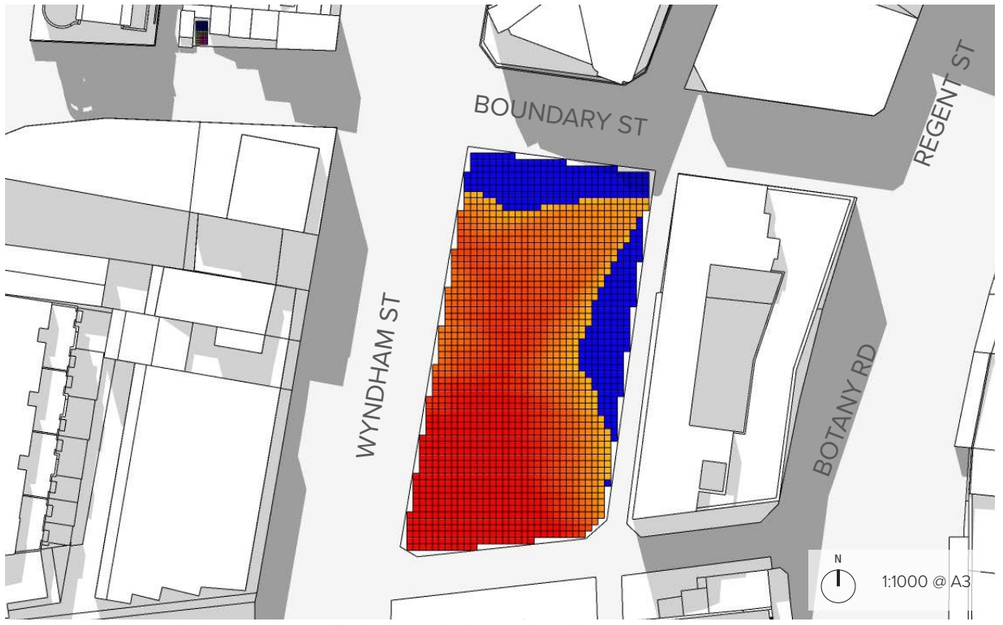
99%

OF OPEN SPACE ACHIEVING MORE THAN 4HRS DIRECT SUNLIGHT

4hrs +

less than 4hrs

Shadow Assessment Proposed



81%

OF OPEN SPACE ACHIEVING MORE THAN 4HRS DIRECT SUNLIGHT

4hrs +

less than 4hrs

*Solar insulation analysis generated at 5 min intervals, in a scale at 1h interval

IMPACT ON PUBLIC SPACE

OPEN SPACE IN CORNWALLIS ST & LOCOMOTIVE ST

Observation:

This open space is not a publicly dedicated park under the Cos, but has been considered as part of the requested solar impact analysis. As the diagrams illustrate, there is a minor decrease in the south-eastern corner for 1hr, however this corner is close to vehicle traffic and little logic exists for people using this part of the open space given it offers broader areas away from vehicles.

Overall the space complies the Cos solar amenity standard.

Open Space Aerial View

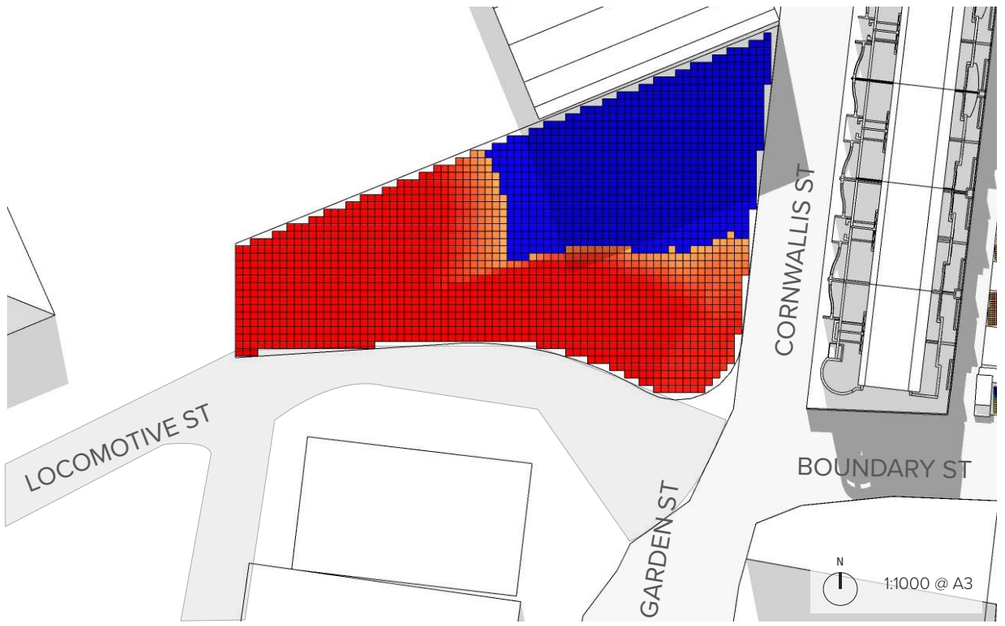
Shadow Assessment Existing

64%

OF OPEN SPACE ACHIEVING MORE THAN 4HRS DIRECT SUNLIGHT

- 4hrs +
- less than 4hrs

Shadow Assessment Proposed



62%

OF OPEN SPACE ACHIEVING MORE THAN 4HRS DIRECT SUNLIGHT

- 4hrs +
- less than 4hrs

*Solar insulation analysis generated at 5 min intervals, in a scale at 1h interval

IMPACT ON PUBLIC SPACE

OPEN SPACE IN CORNWALLIS ST & LOCOMOTIVE ST

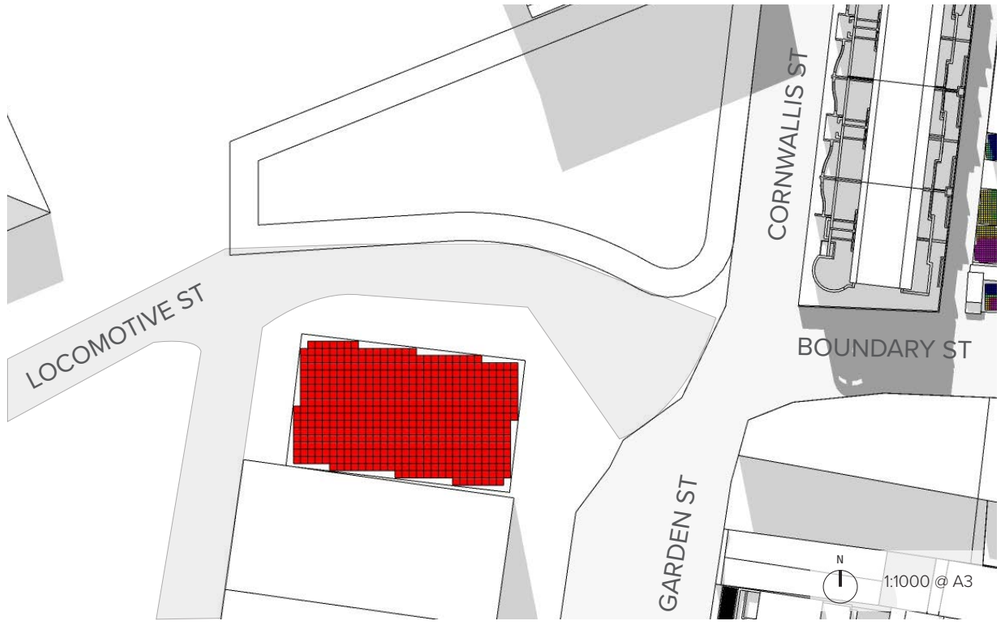
Observation:

This open space is not a publicly dedicated park to the Cos, but has been considered as part of the requested solar impact analysis. The proposal does not impact on the space.

The proposal does not have an impact on the space.

Open Space Aerial View

Shadow Assessment Existing



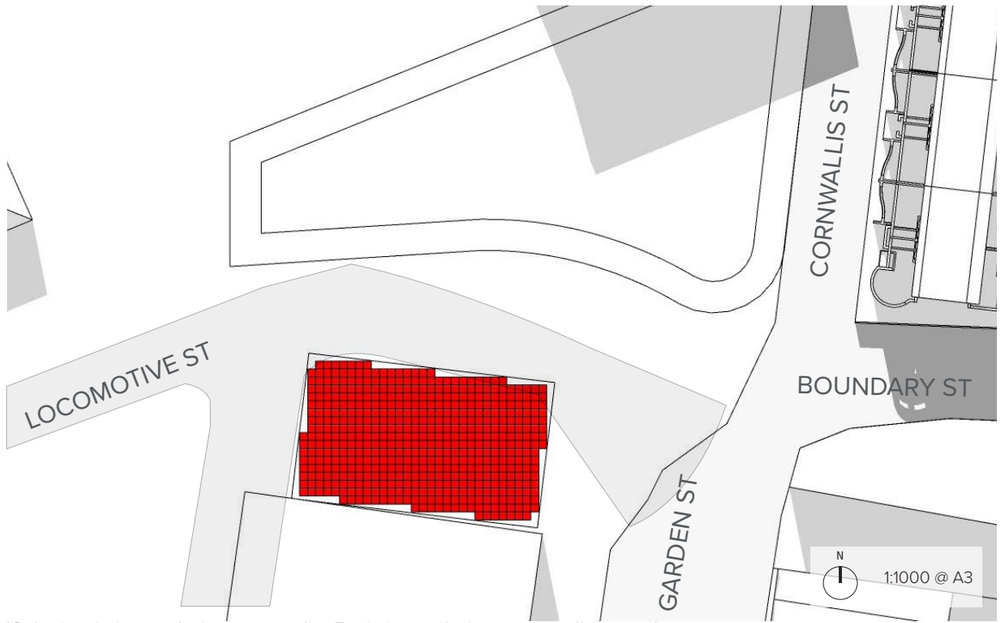
100%

OF OPEN SPACE ACHIEVING MORE THAN 4HRS DIRECT SUNLIGHT

4hrs +

less than 4hrs

Shadow Assessment Proposed



100%

OF OPEN SPACE ACHIEVING MORE THAN 4HRS DIRECT SUNLIGHT

4hrs +

less than 4hrs

*Solar insulation analysis generated at 5 min intervals, in a scale at 1h interval

IMPACT ON RESIDENTIAL BUILDING

80 ROSEHILL STREET

Observation:

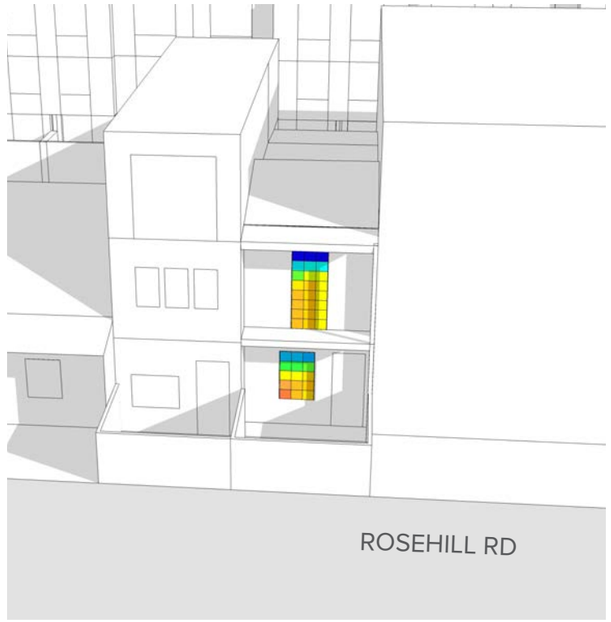
The proposal has a small impact on the solar amenity of the existing building. It is noted that in the existing condition, the windows on the east elevation received less than 1.5 hours of direct sunlight and the windows on the west elevation received no direct sunlight at all. The private open space to the rear of the building receives no direct sunlight between the hours of 9am to 3pm. As illustrated in the following sequence of diagrams, the proposal has impacted upon the east elevation resulting in no direct sunlight. However, the proposal has significantly increased the amount of sunlight upon the backyard to around 1.5 to 2 hours on the winter solstice.

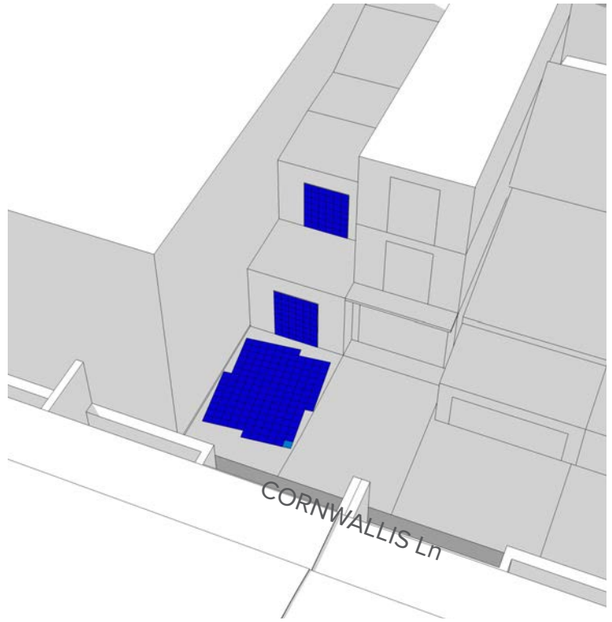
Building Aerial View

Hours of direct sunlight received on winter solstice.

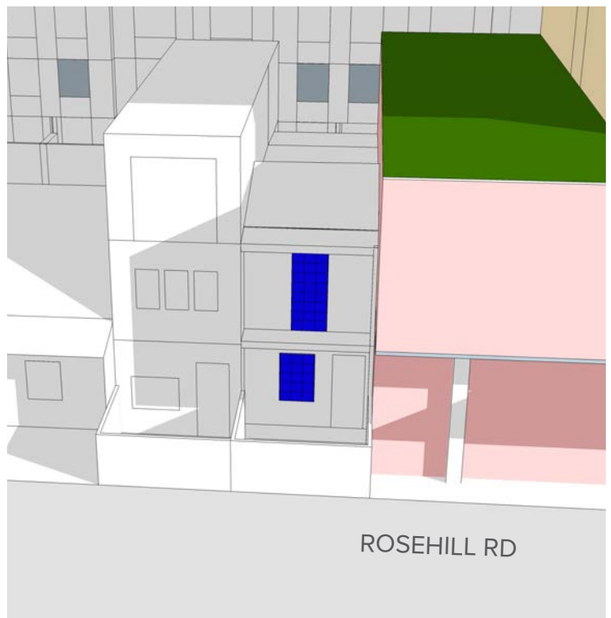
- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing





Shadow Assessment Proposed



IMPACT ON RESIDENTIAL BUILDING

82 ROSEHILL STREET

Observation:

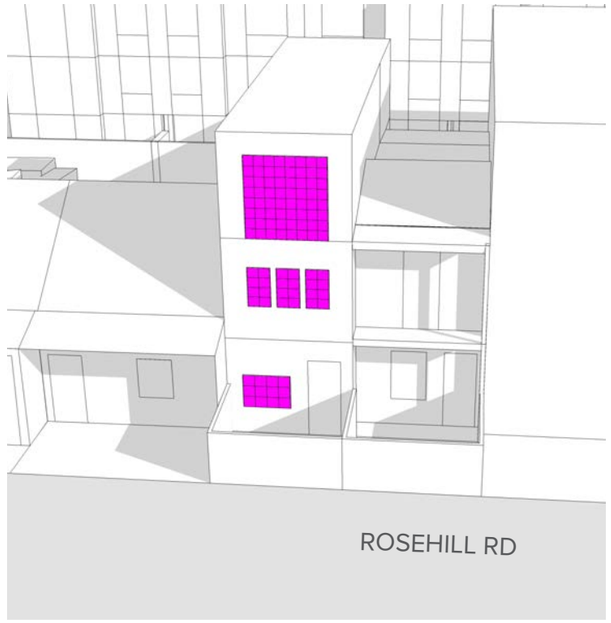
The proposal has a small impact on the solar amenity of the existing building. It is noted that in the existing condition, whilst the east façade receives at least 2 hours of direct sunlight, the majority of the backyard receives no direct sunlight between the hours of 9am to 3pm. As illustrated in the following sequence of diagrams, the proposal has impacted upon the east elevation mainly on the lower floor, decreasing the number of hours of direct sunlight. Overall, the proposal has increased the amount of sunlight on the west elevation and in the open space to the rear of the building, with around 1.5 to 2 hours of sunlight on the backyard.

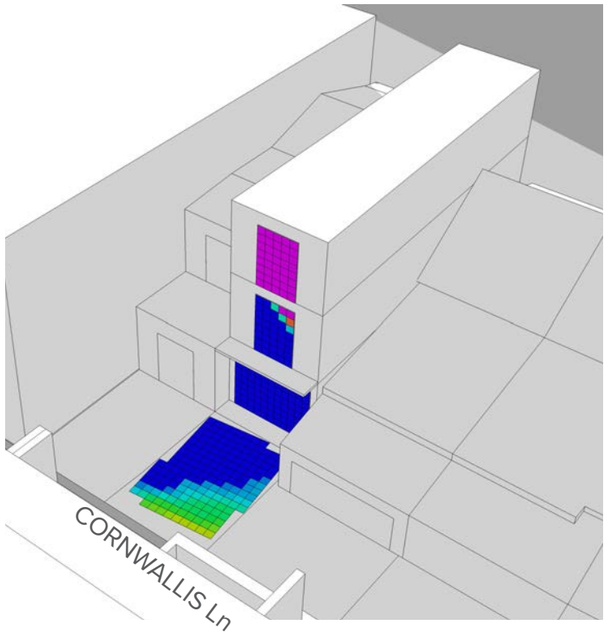
Building Aerial View

Hours of direct sunlight received on winter solstice.

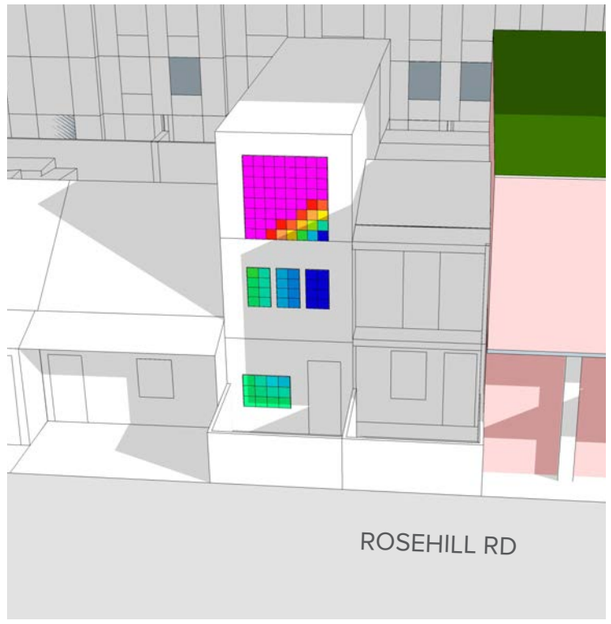
- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

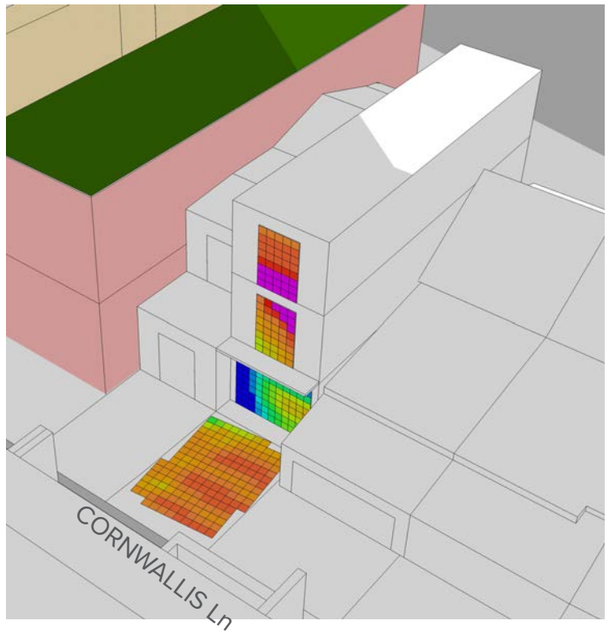
Shadow Assessment Existing





Shadow Assessment Proposed





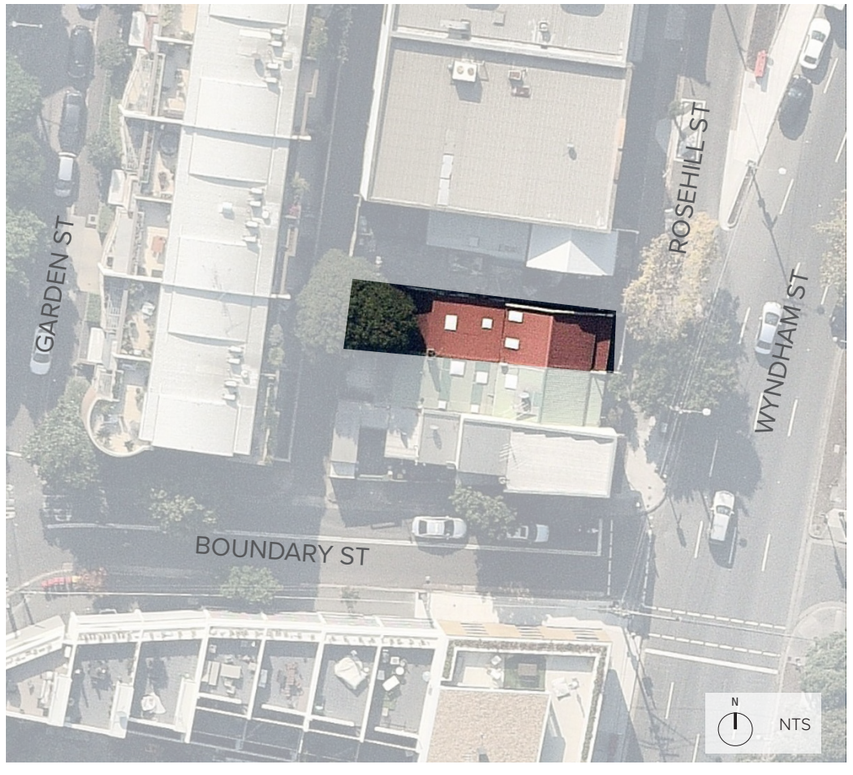
IMPACT ON RESIDENTIAL BUILDING

84 ROSEHILL STREET

Observation:

The proposal has a small impact on the solar amenity of the existing building. It is noted that in the existing condition, the windows on the east elevation and on the roof of the building receive minimal or no direct sunlight. As illustrated in the following sequence of diagrams, the proposal has not impacted the east elevation or the windows on the roof. However, the amount of direct sunlight received by the west elevation and the rear backyard has increased to around 1.5 to 2 hours on the winter solstice.

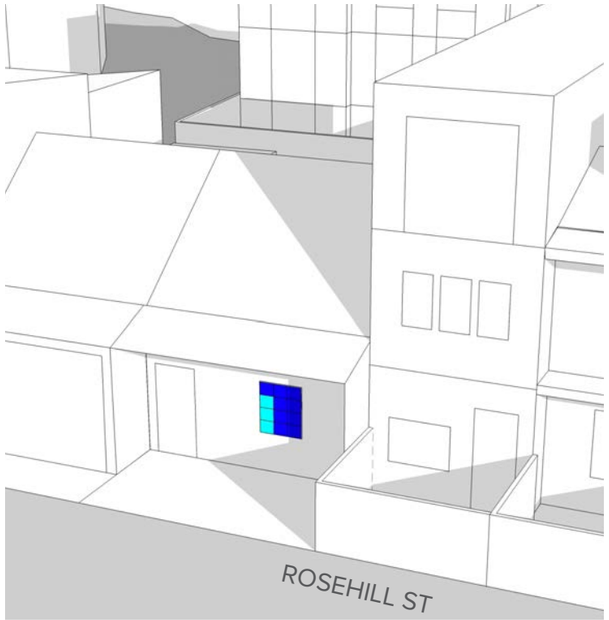
Building Aerial View

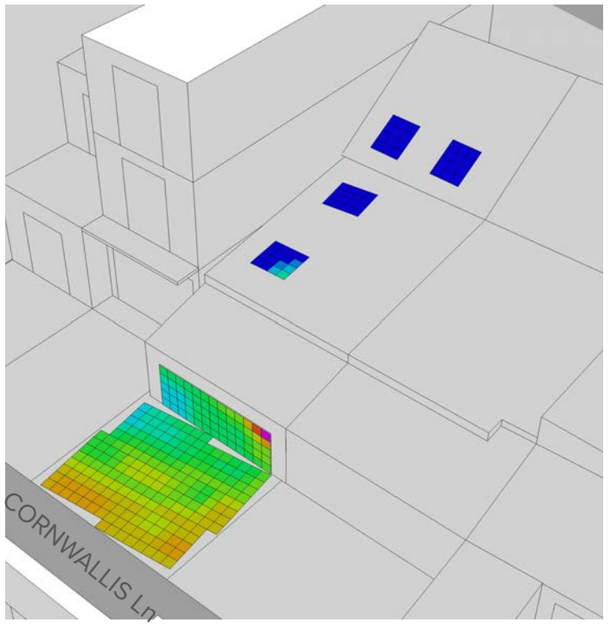


Hours of direct sunlight received on winter solstice.

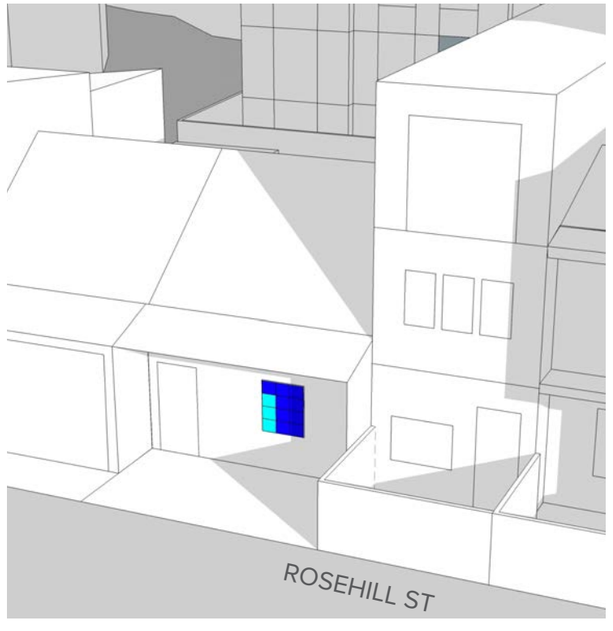
- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

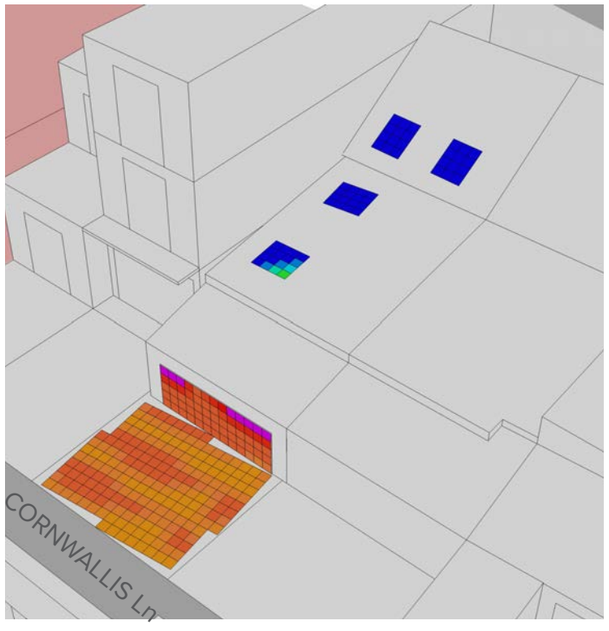
Shadow Assessment Existing





Shadow Assessment Proposed





IMPACT ON RESIDENTIAL BUILDING

88 ROSEHILL STREET

Observation:

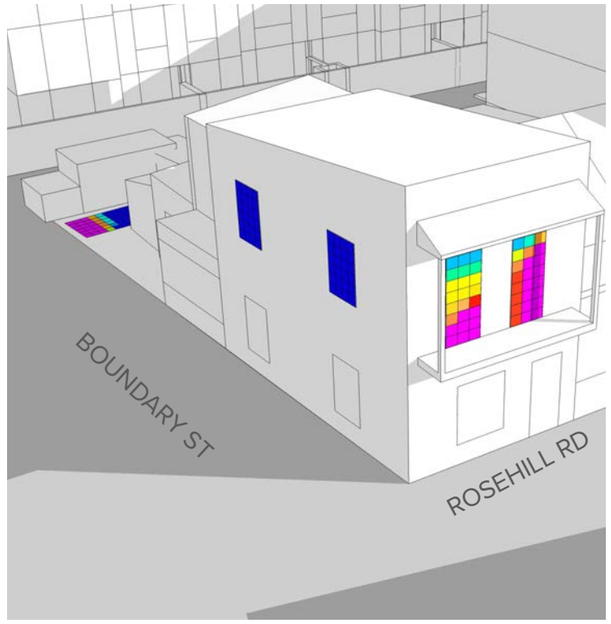
The proposal has a small impact on the solar amenity of the usable outdoor spaces for 1 sqm. The existing building it is not compliant with the minimum solar access.
The ground floor is non residential use.

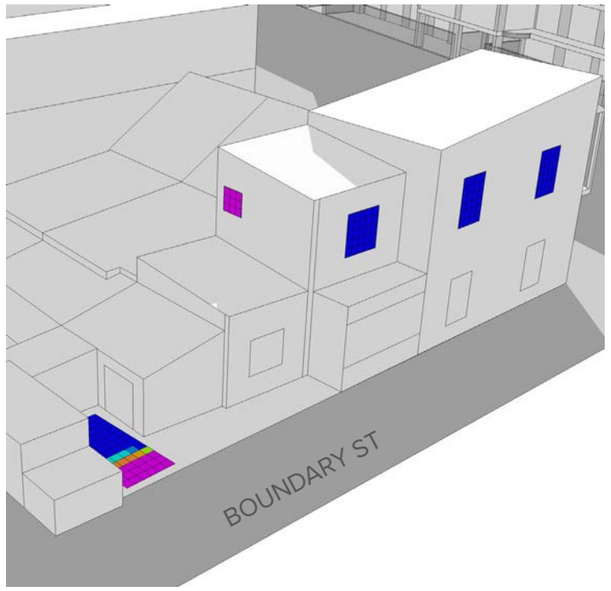
Building Aerial View

Hours of direct sunlight received on winter solstice.

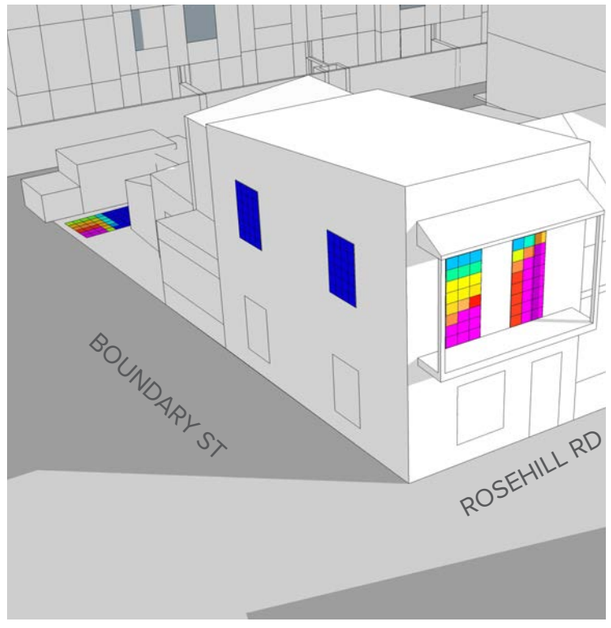
- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

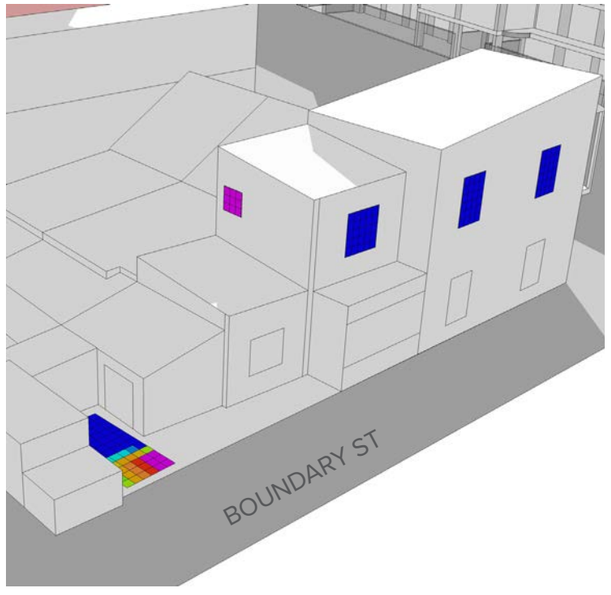
Shadow Assessment Existing





Shadow Assessment Proposed





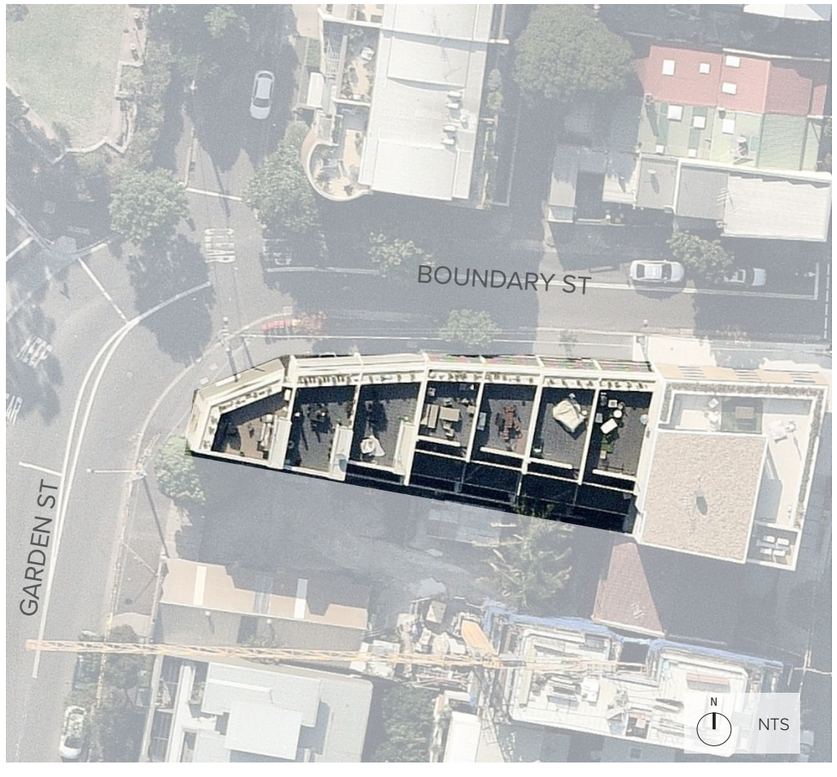
IMPACT ON RESIDENTIAL BUILDING

2 GARDEN STREET

Observation:

The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion.

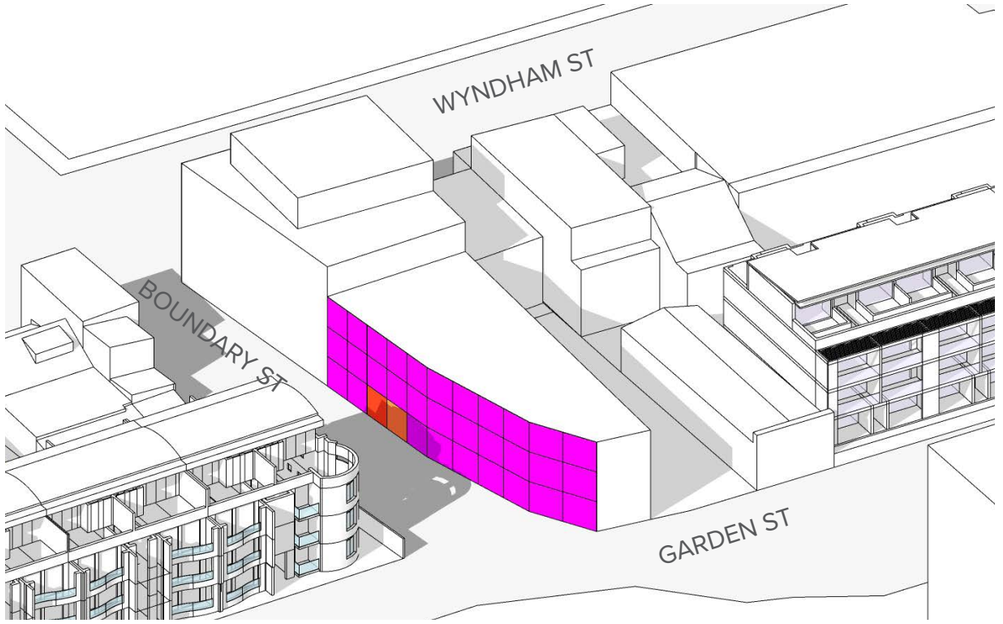
Building Aerial View



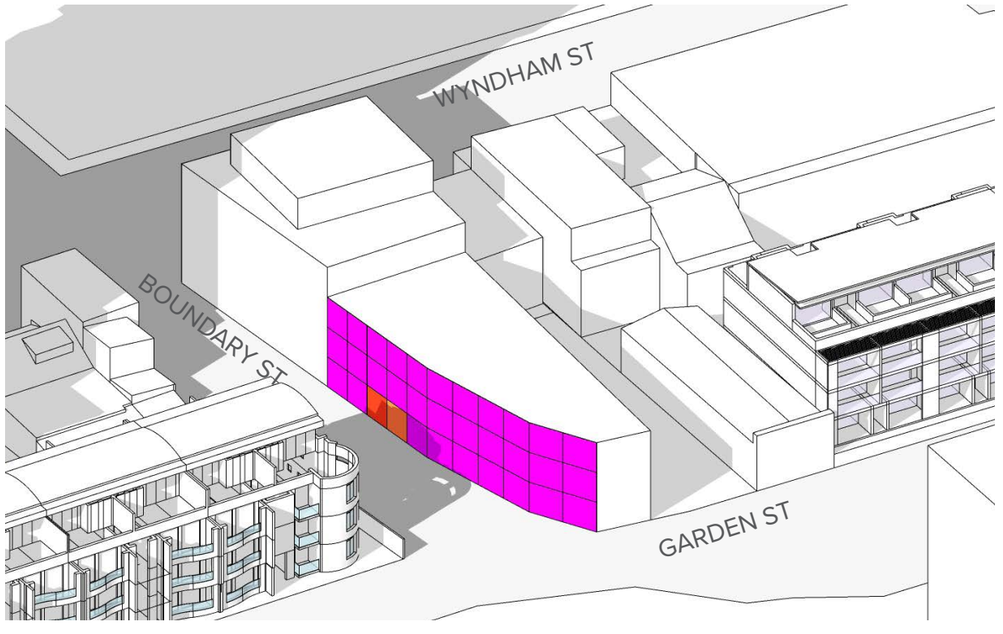
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed



IMPACT ON RESIDENTIAL BUILDING

3 WYNDHAM STREET

Observation:

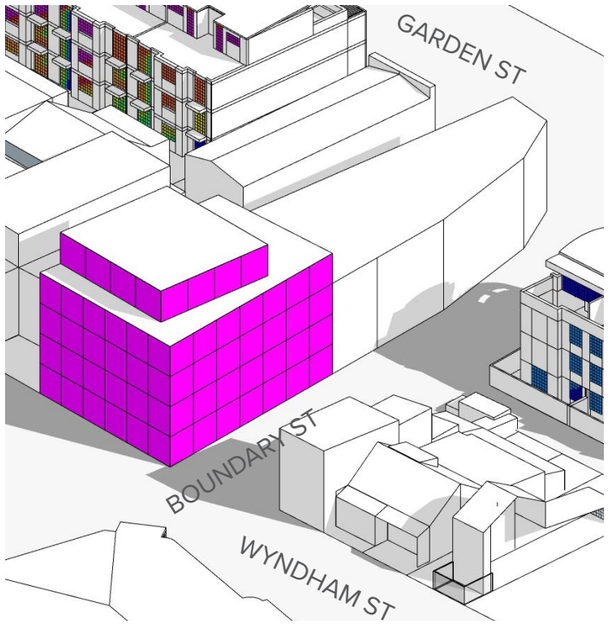
The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion. The ground floor is non residential use.

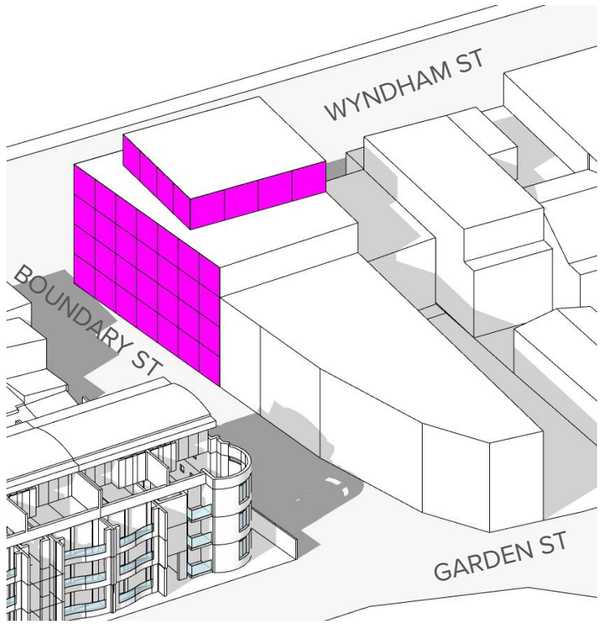
Building Aerial View

Hours of direct sunlight received on winter solstice.

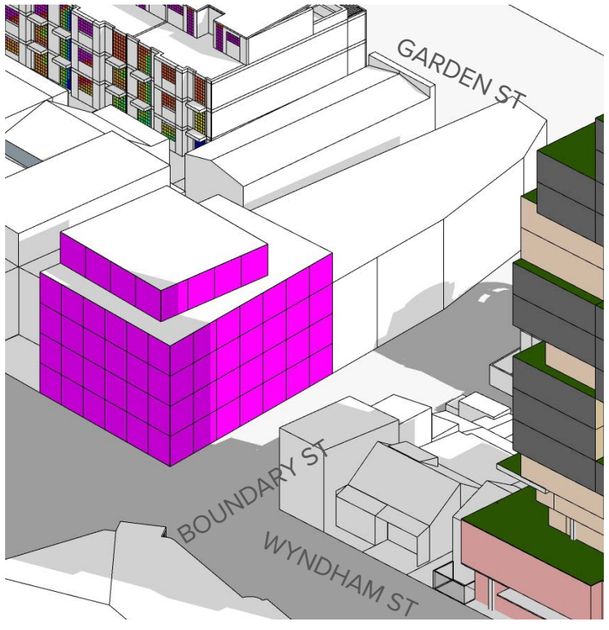
- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

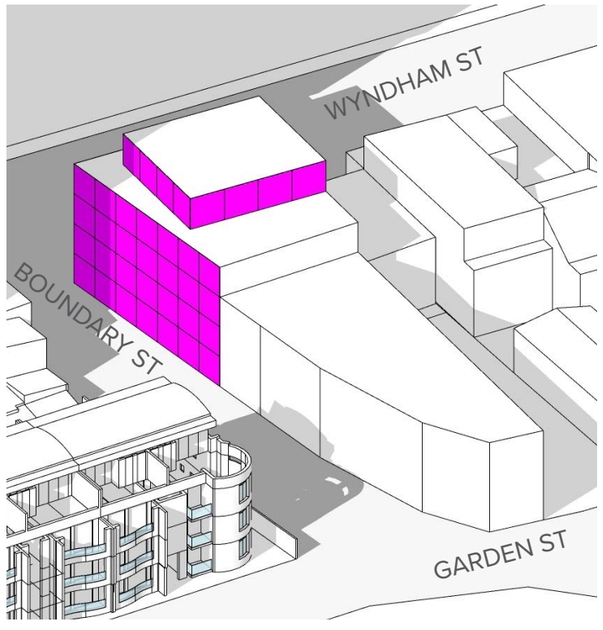
Shadow Assessment Existing





Shadow Assessment Proposed





IMPACT ON RESIDENTIAL BUILDING

5 WYNDHAM STREET

Observation:

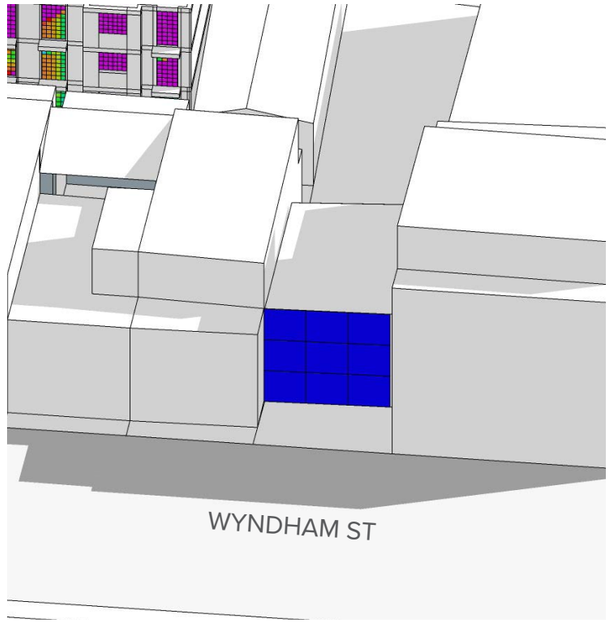
The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion.

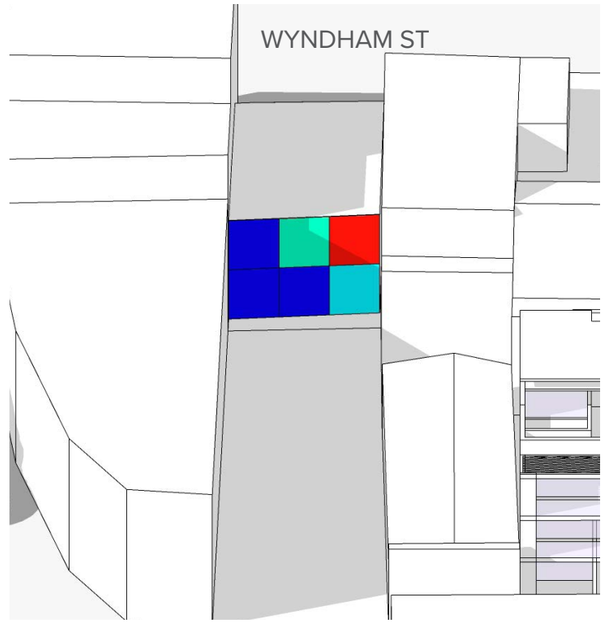
Building Aerial View

Hours of direct sunlight received on winter solstice.

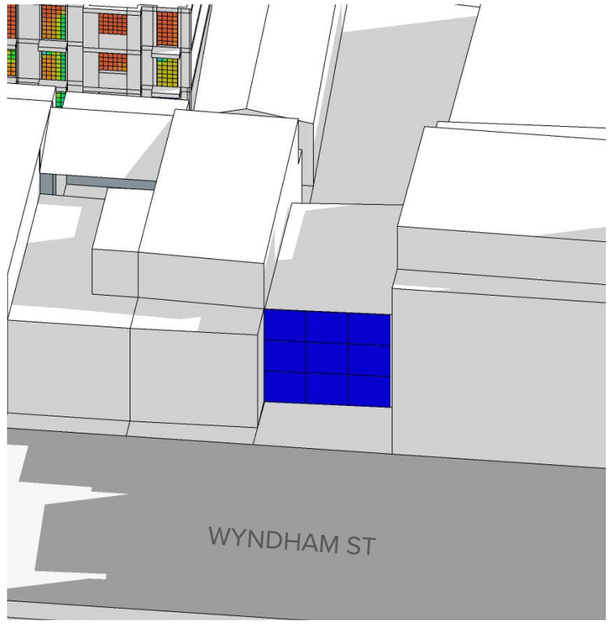
- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

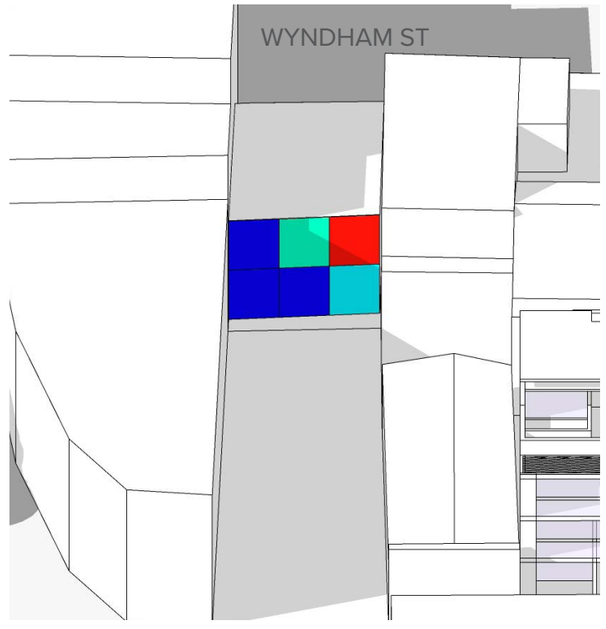
Shadow Assessment Existing





Shadow Assessment Proposed





IMPACT ON RESIDENTIAL BUILDING

7 WYNDHAM STREET

Observation:

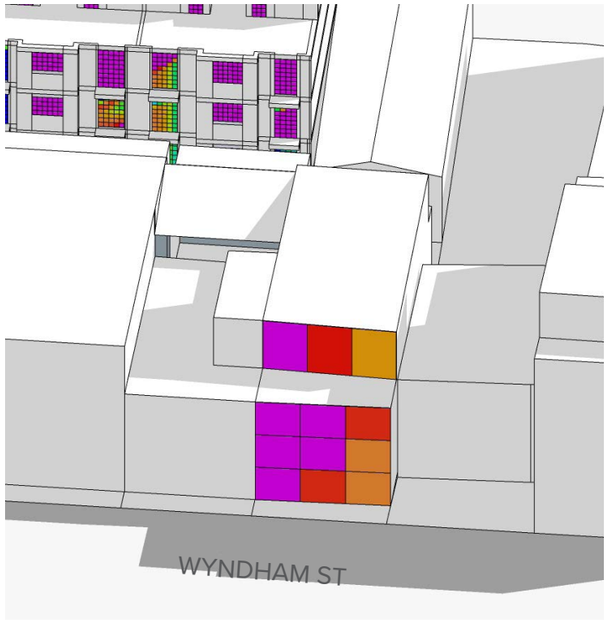
The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion.

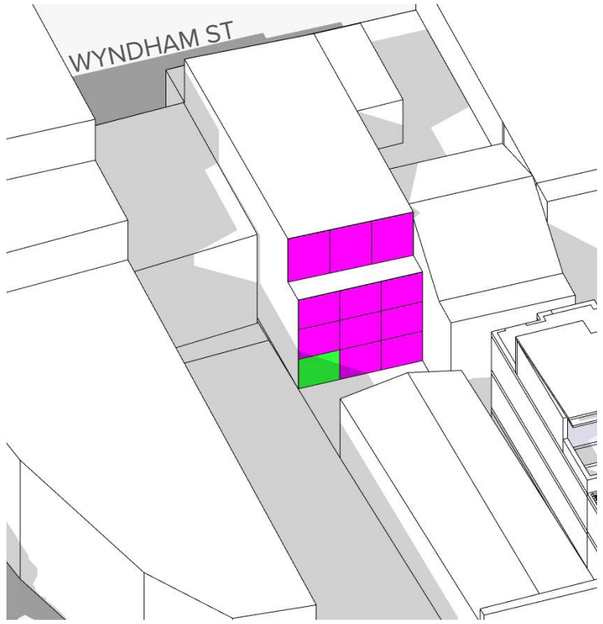
Building Aerial View

Hours of direct sunlight received on winter solstice.

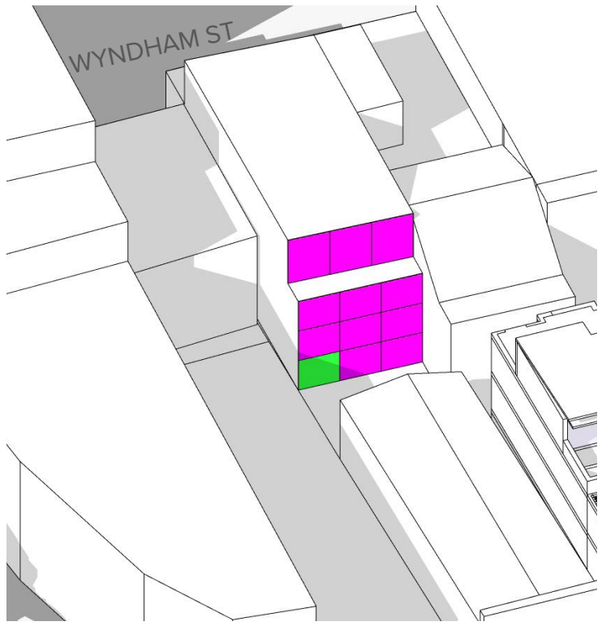
- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing





Shadow Assessment Proposed



IMPACT ON RESIDENTIAL BUILDING

9 WYNDHAM STREET

Observation:

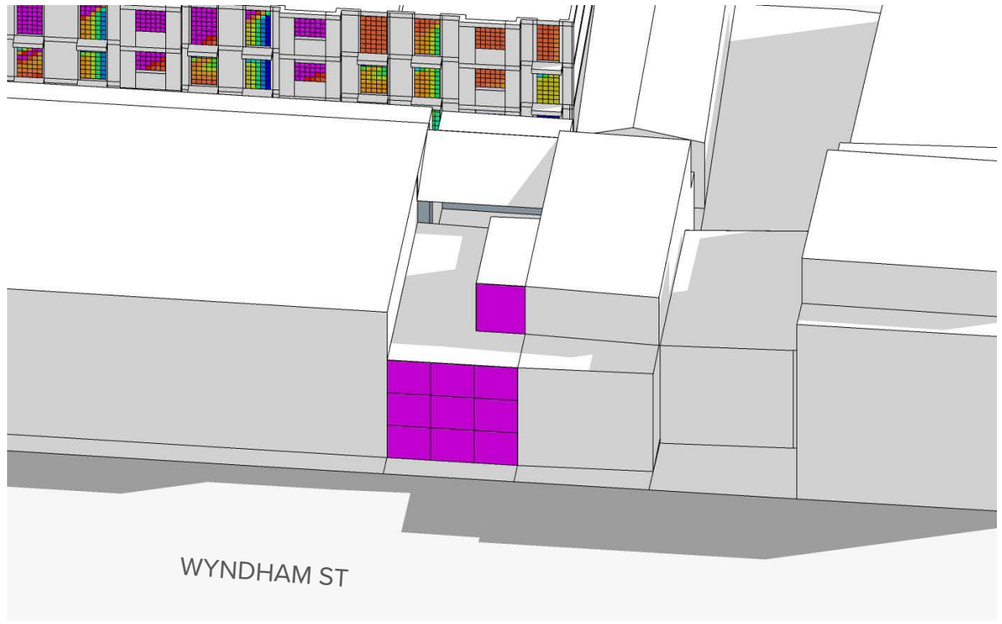
The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion.

Building Aerial View

Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed

IMPACT ON RESIDENTIAL BUILDING

11 WYNDHAM STREET

Observation:

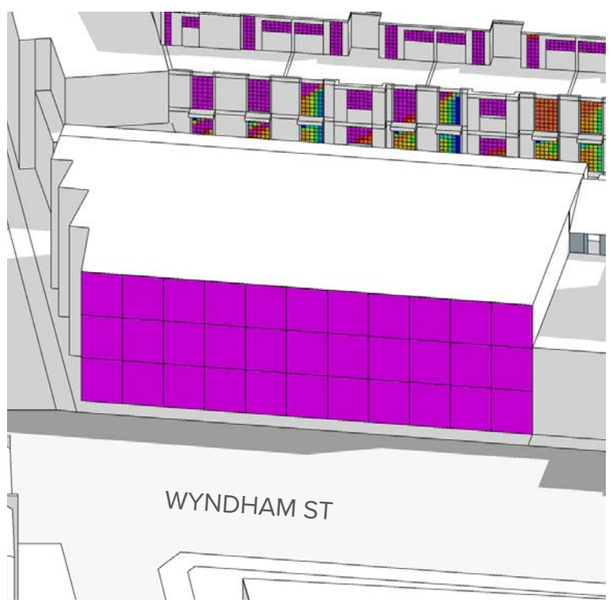
The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion.

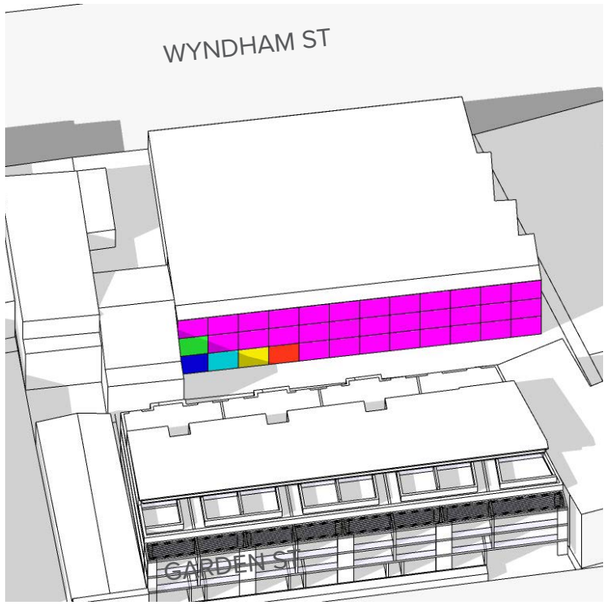
Building Aerial View

Hours of direct sunlight received on winter solstice.

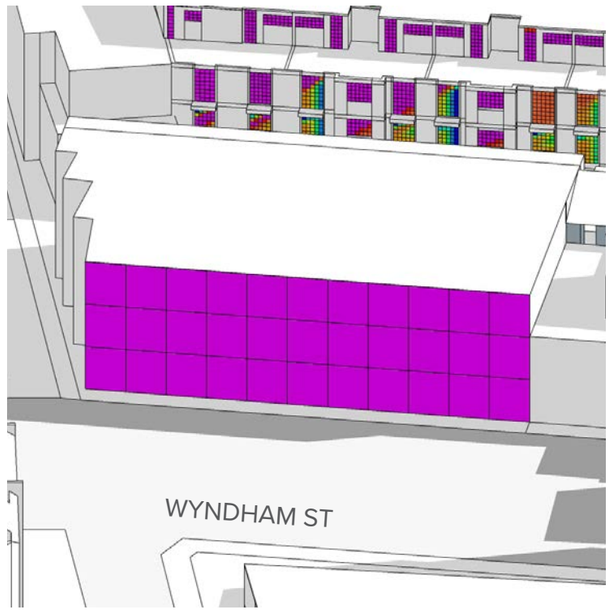
- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

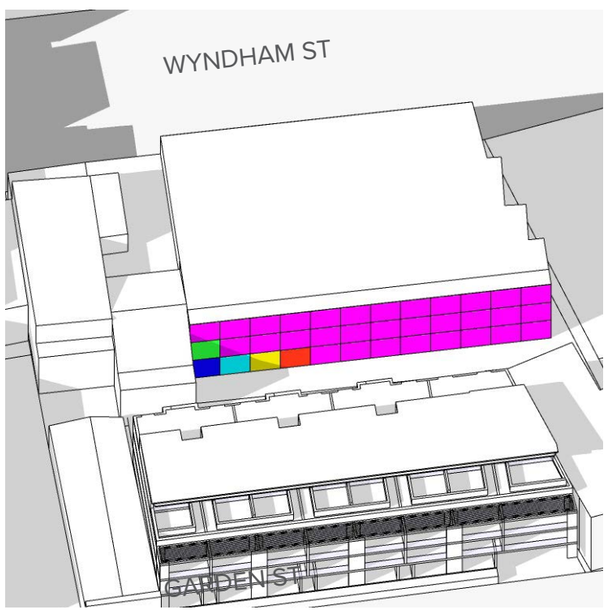
Shadow Assessment Existing





Shadow Assessment Proposed





IMPACT ON RESIDENTIAL BUILDING

199 REGENT STREET

Observation:

The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion. The ground floor is non residential use.

Building Aerial View

Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing

Shadow Assessment Proposed

IMPACT ON RESIDENTIAL BUILDING

1-3 BOTANY STREET

Observation:

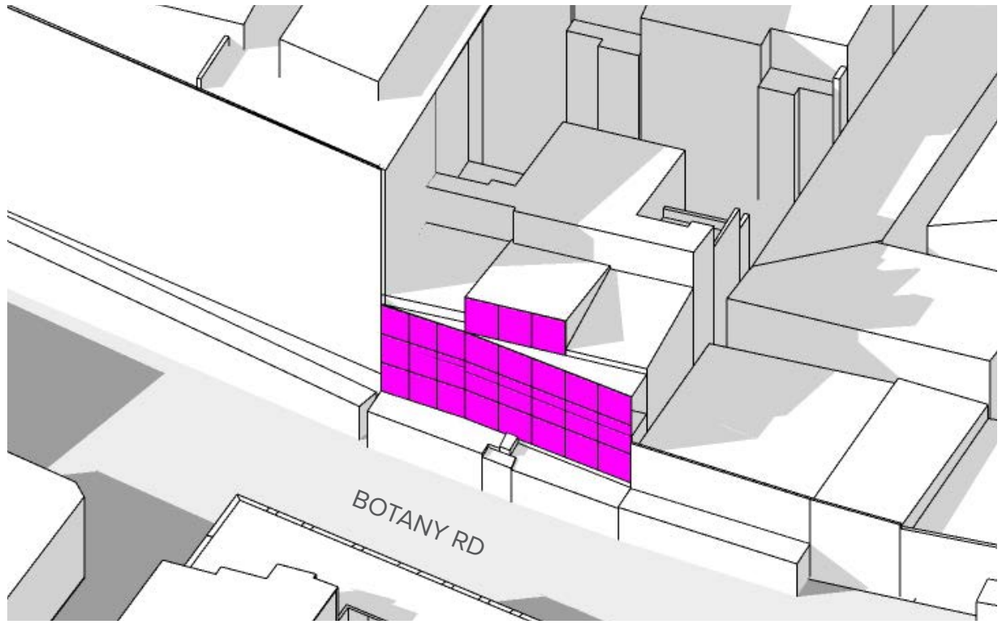
The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion. The ground floor is non residential use.

Building Aerial View

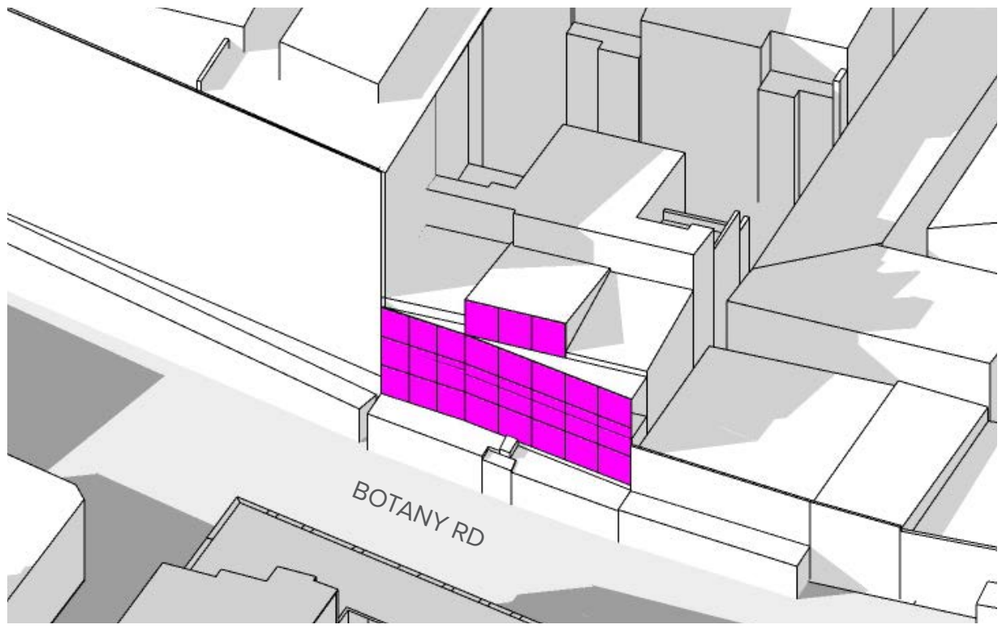
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed



IMPACT ON RESIDENTIAL BUILDING

76-78 COPE STREET

Observation:

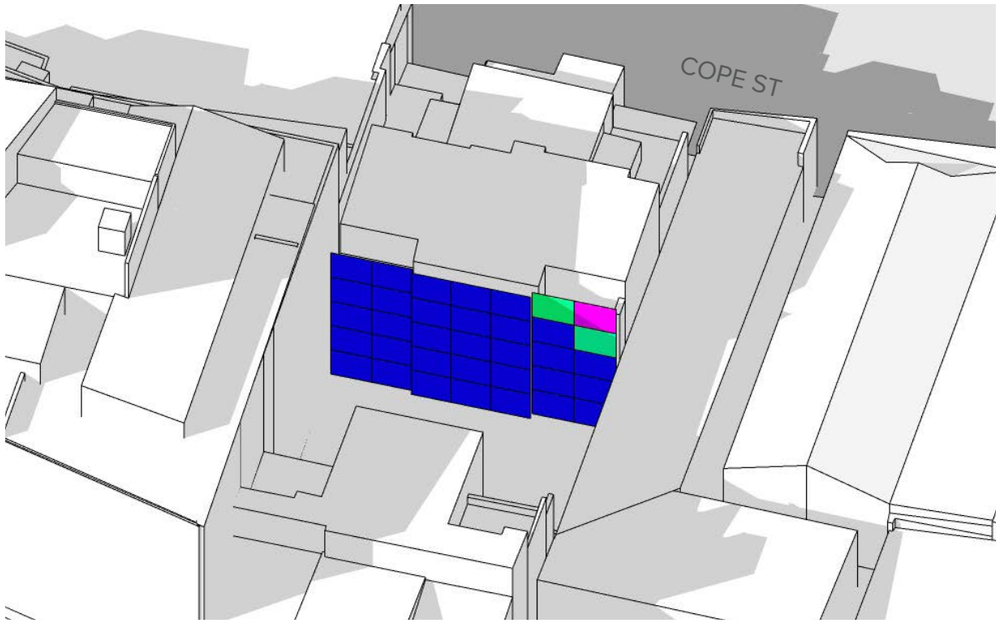
The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The west facade can't have direct sunlight because it's cover from the building on 199 Regent St.
The following sequence of diagrams justifies this conclusion.

Building Aerial View

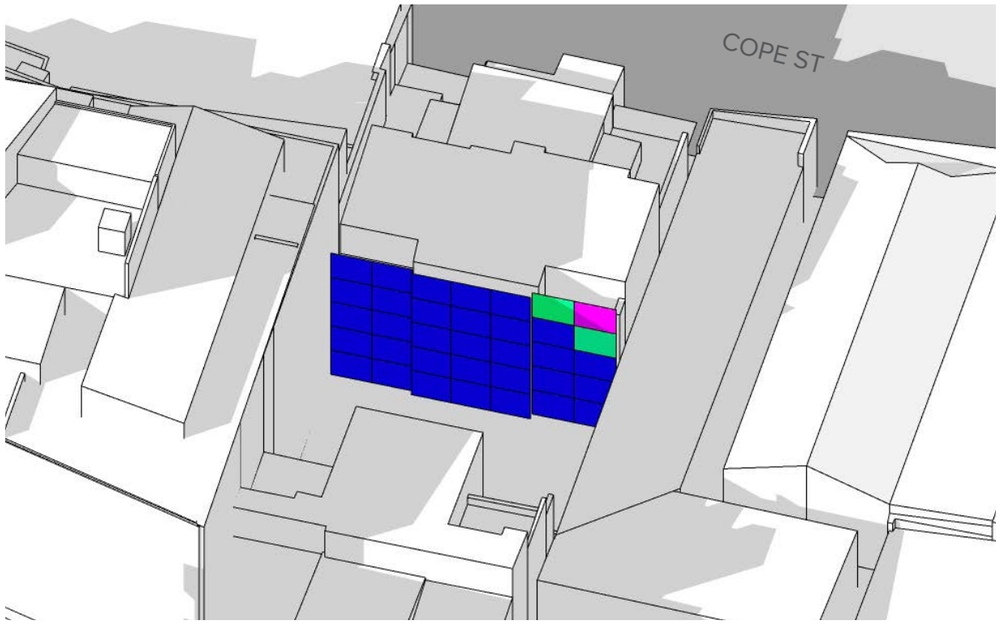
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed



IMPACT ON RESIDENTIAL BUILDING

11 BOTANY ROAD

Observation:

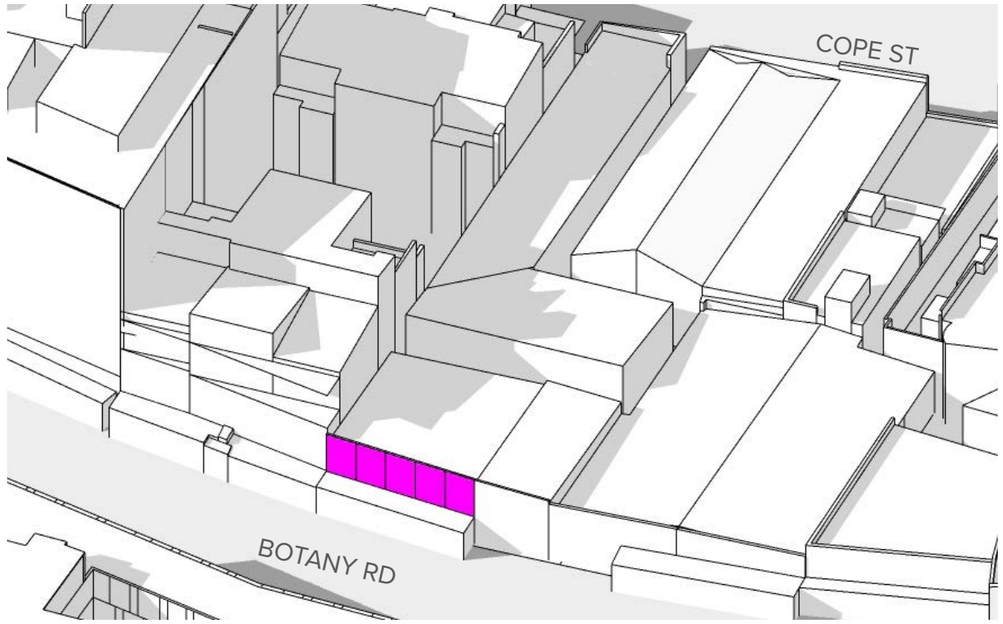
The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion. The ground floor is non residential use.

Building Aerial View

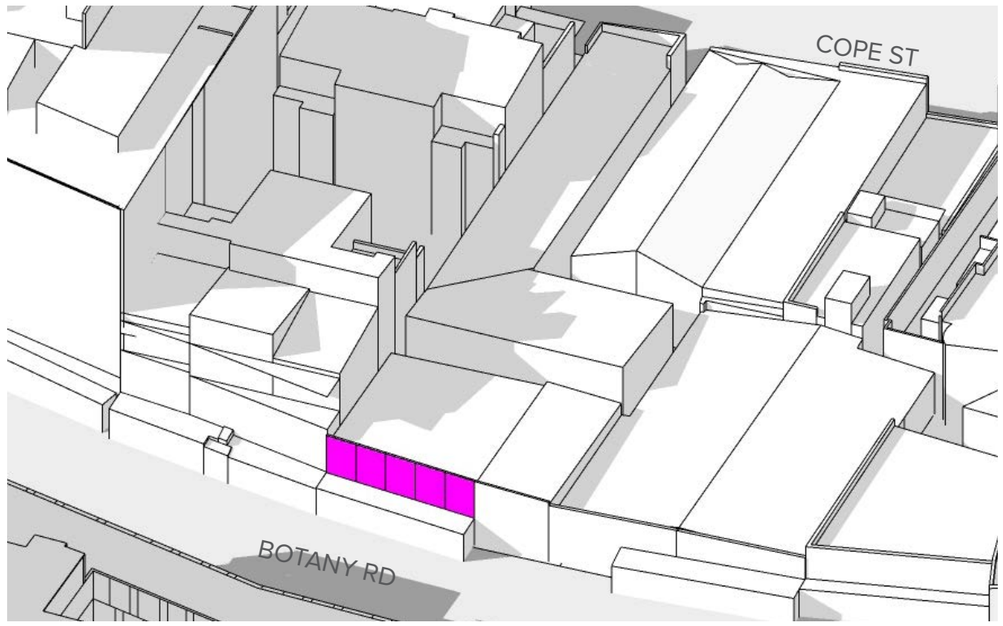
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed



IMPACT ON RESIDENTIAL BUILDING

9 BOTANY ROAD

Observation:

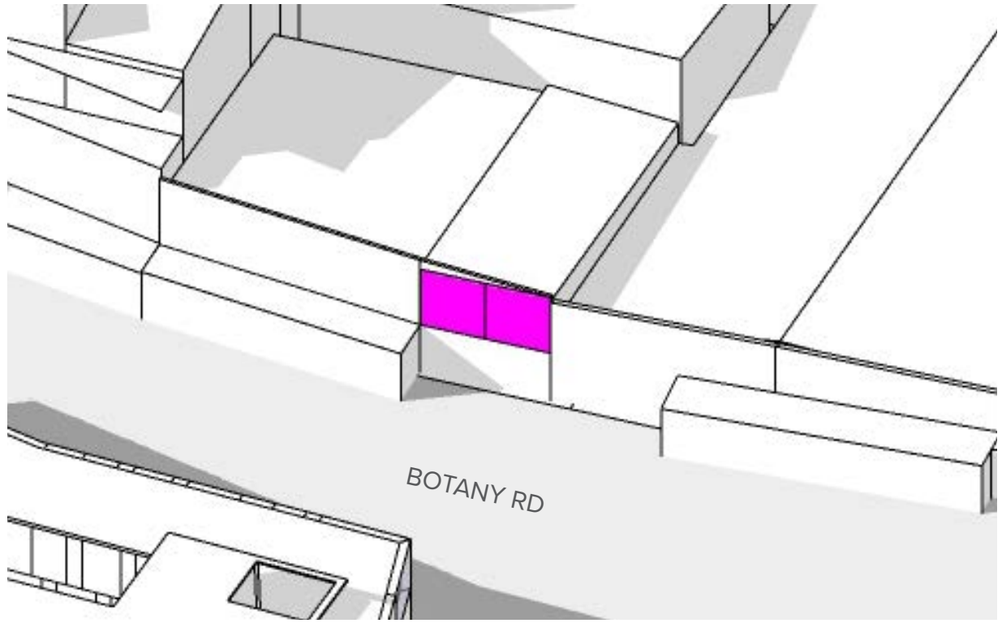
The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion. The ground floor is non residential use.

Building Aerial View

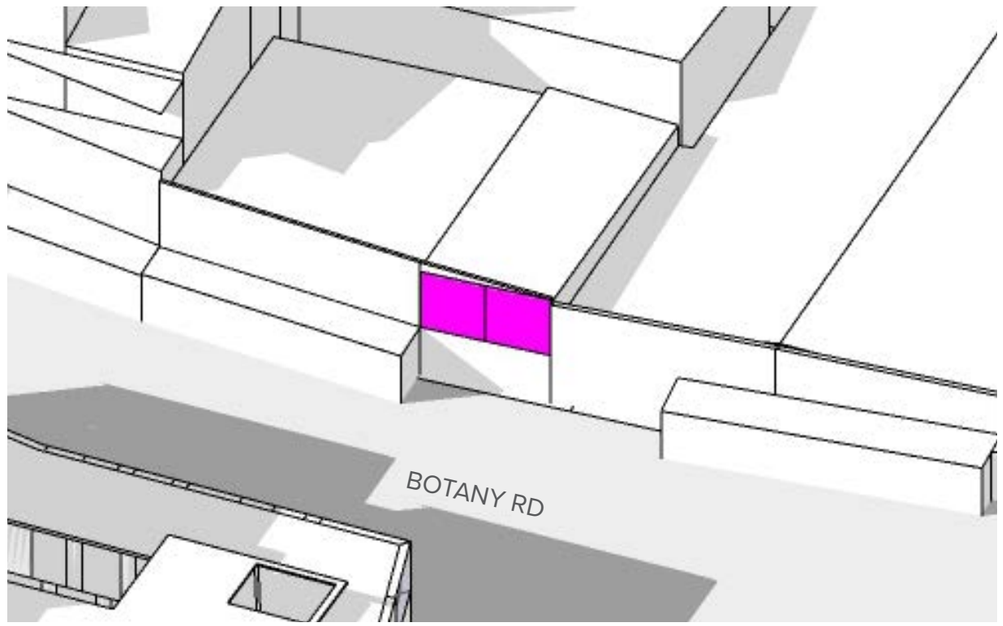
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed



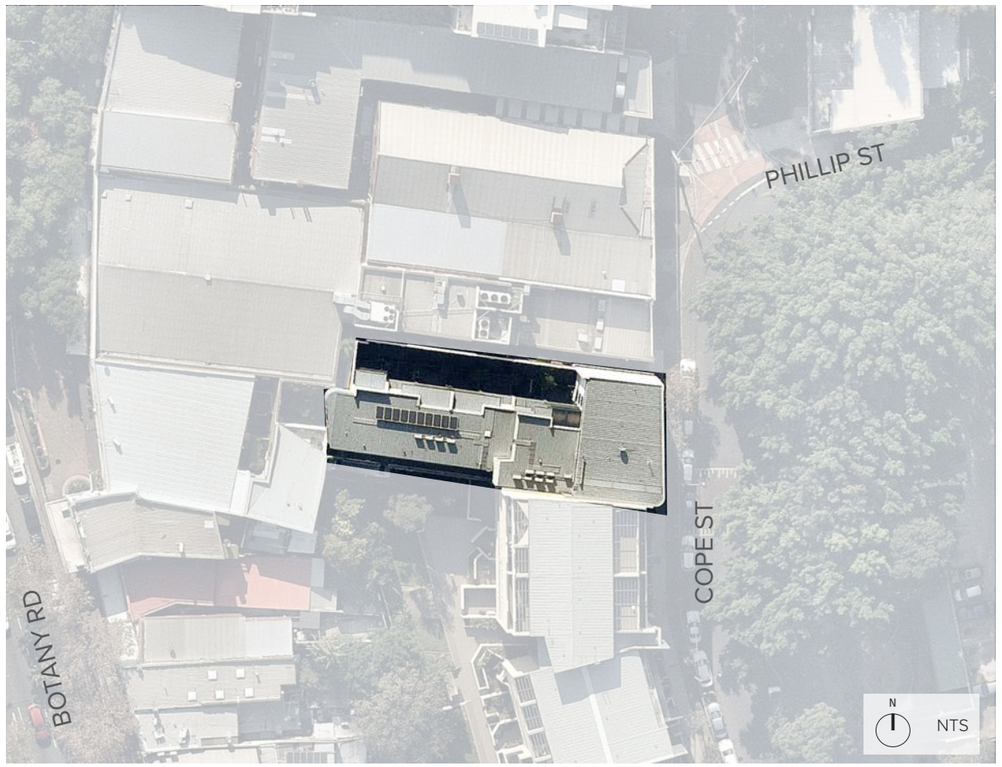
IMPACT ON RESIDENTIAL BUILDING

86 COPE ST

Observation:

The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion.

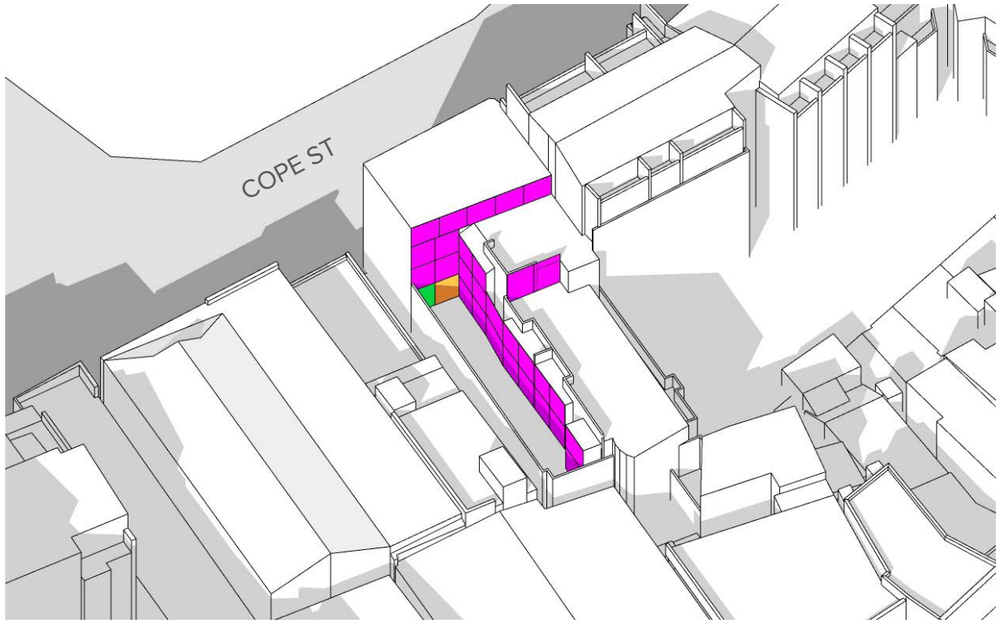
Building Aerial View



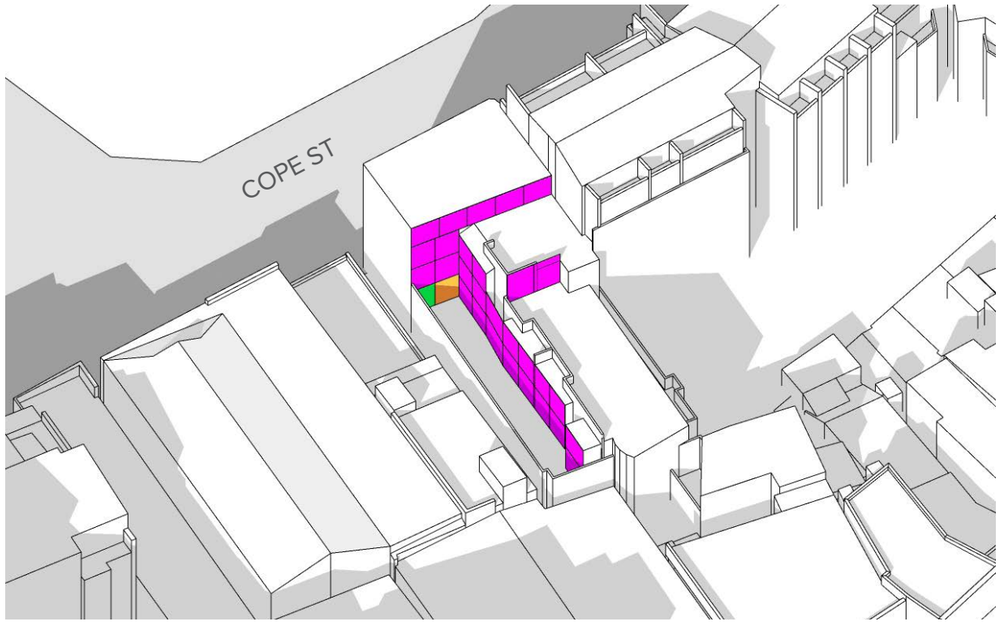
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed



IMPACT ON RESIDENTIAL BUILDING

37-61 GIBBONS STREET

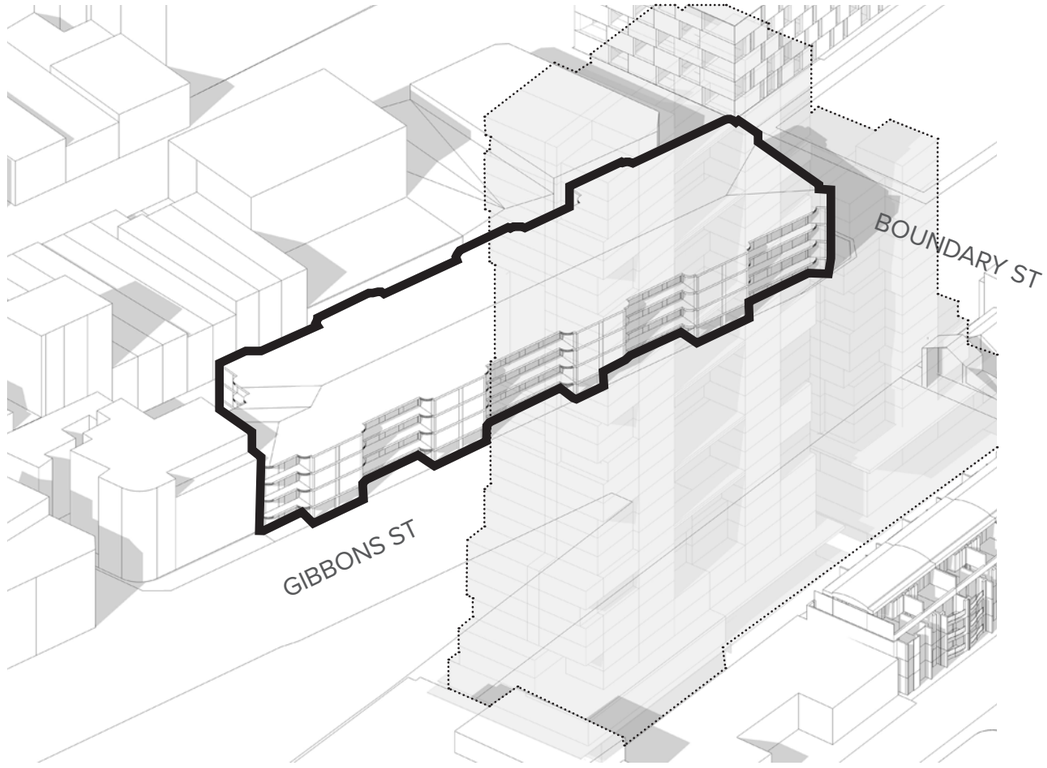
Observation:

The proposal has a minor impact on the solar amenity of the existing building, being a total of 6 apartments. It is noted 50% (3) of these impacted apartments are located on the ground floor where there is little evidence of usable floor space benefiting from solar amenity given the traffic dominance of Gibbons Street. It addition, it is noted the apartment age means it is a likely redevelopment site over the medium term.

The proposal is considered appropriate in terms of its solar impact on this building. It has a minor impact on 3 apartments which is considered acceptable due to site influences, building age and likelihood of redevelopment within an urban renewal precinct.

Building Aerial View

Axonometric View



IMPACT ON RESIDENTIAL BUILDING

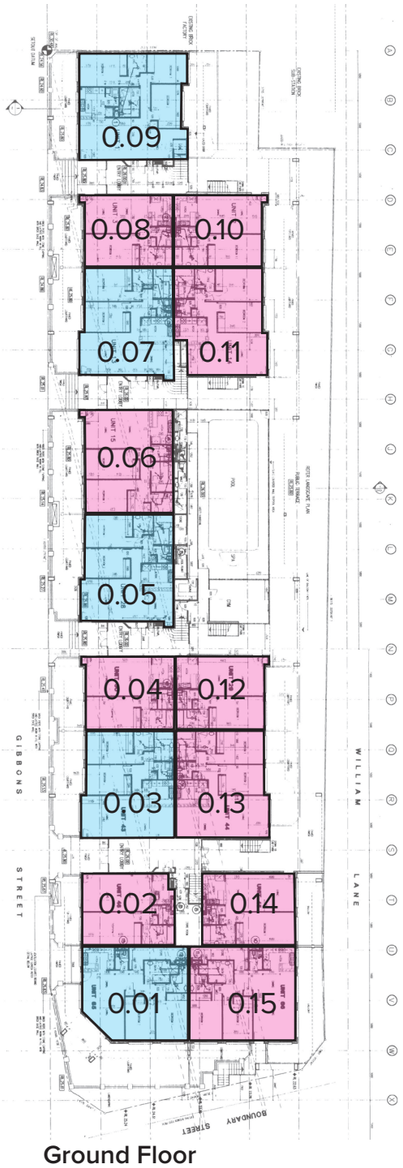
37-61 GIBBONS STREET

EXISTING 40/66 Compliant

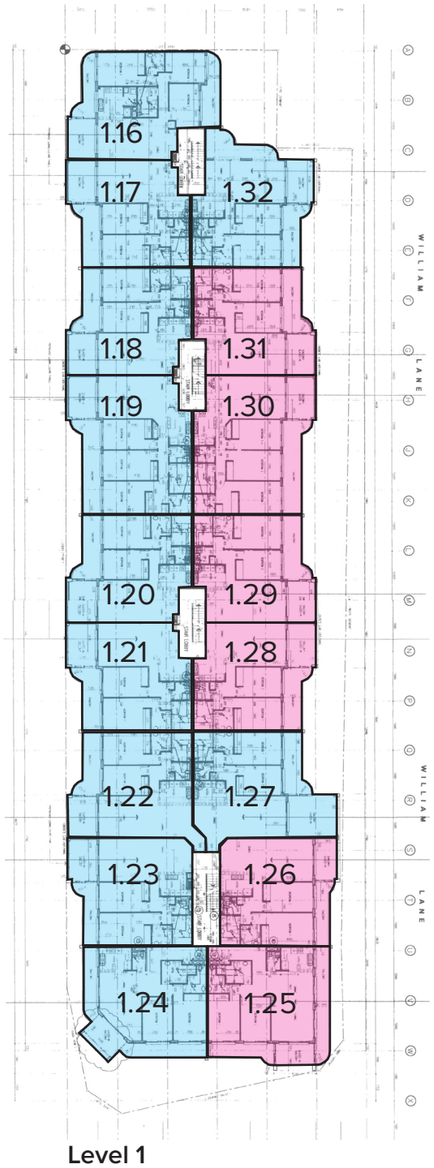
Building Floor Plans

Compliant Situation

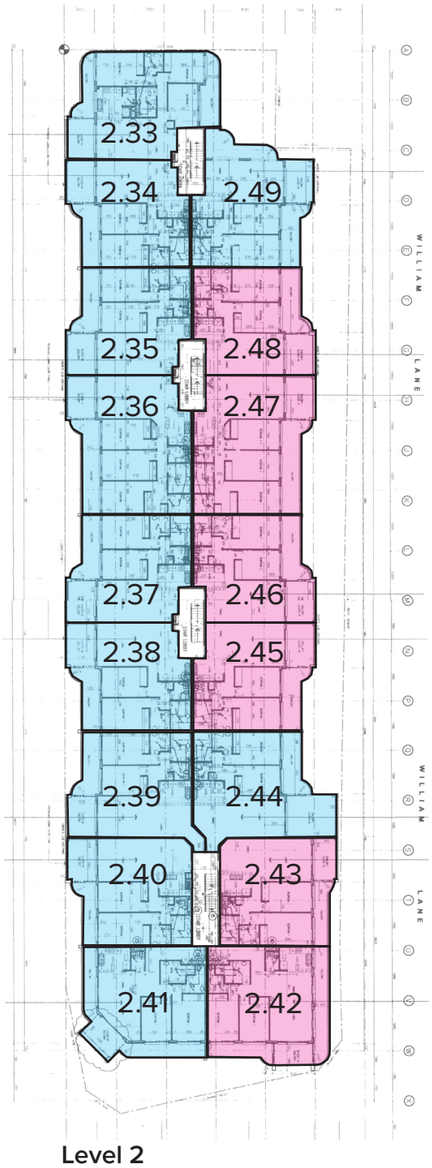
Non-compliant Situation



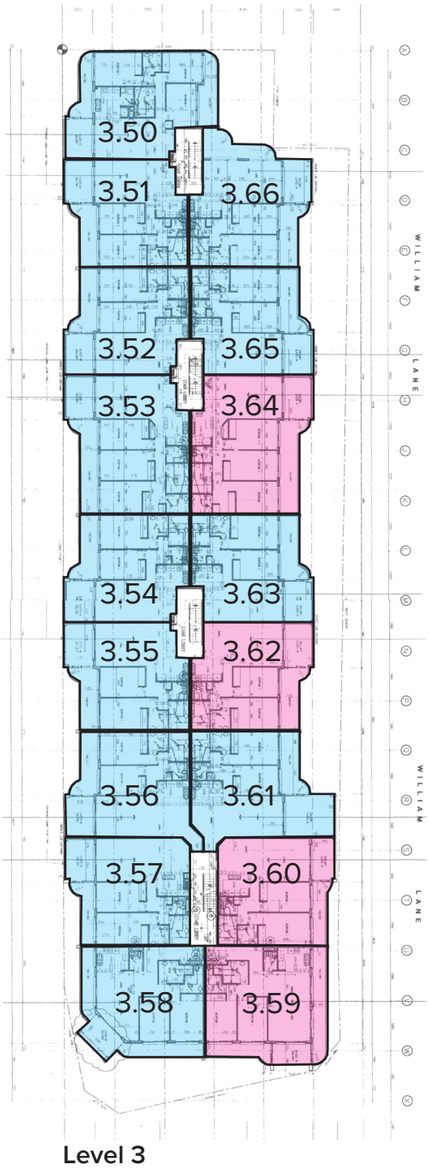
Ground Floor



Level 1



Level 2



Level 3

IMPACT ON RESIDENTIAL BUILDING

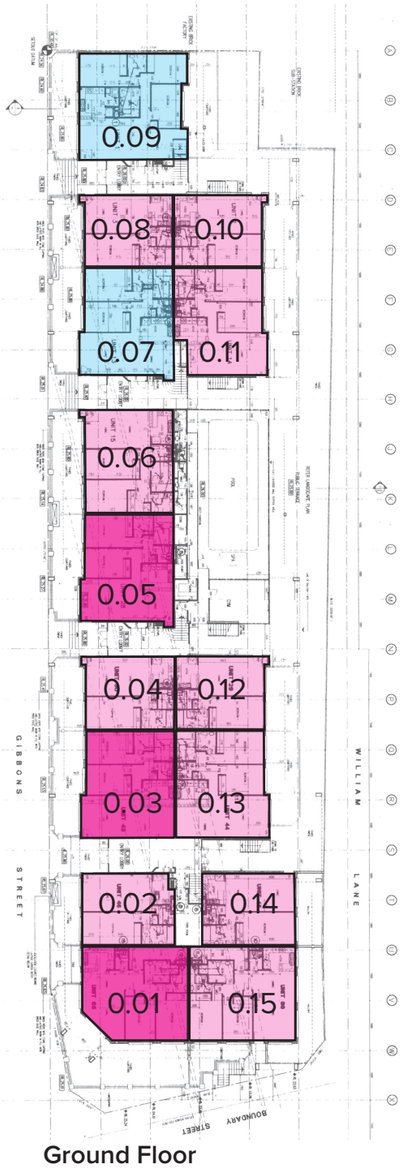
37-61 GIBBONS STREET

PROPOSED 34/66 Compliant

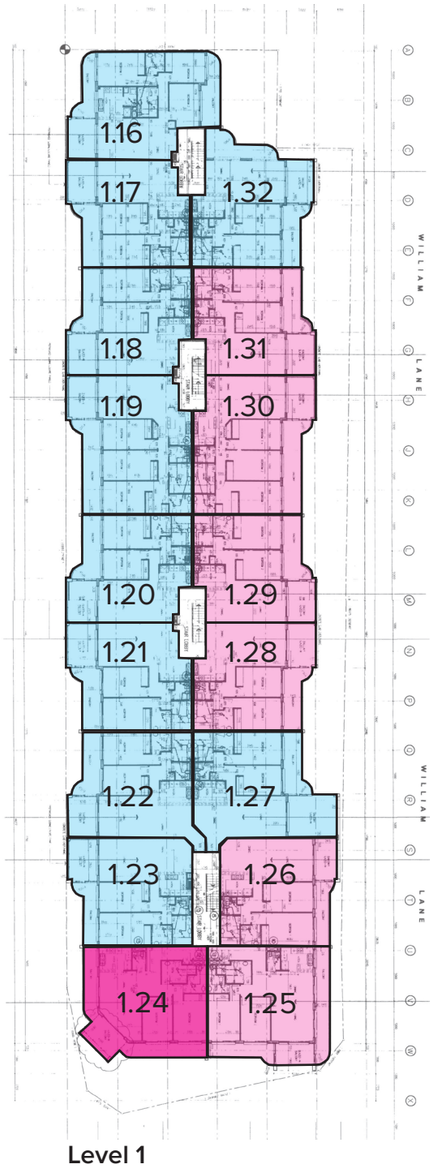
Building Floor Plans

Compliant Situation

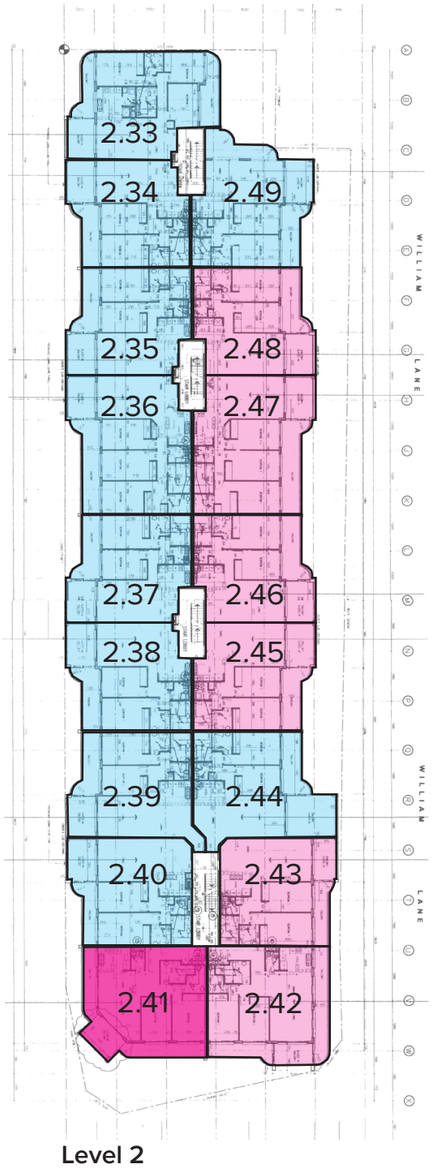
Non-compliant Situation



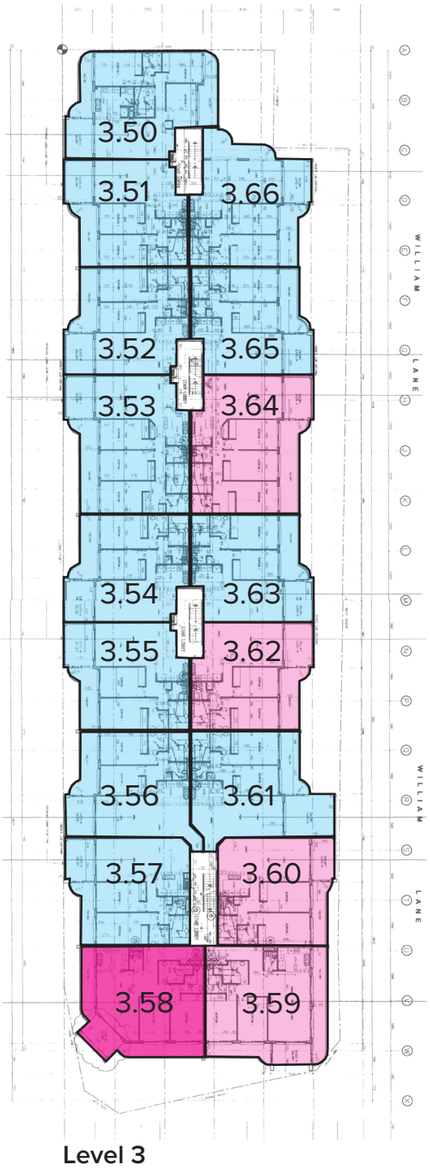
Ground Floor



Level 1



Level 2

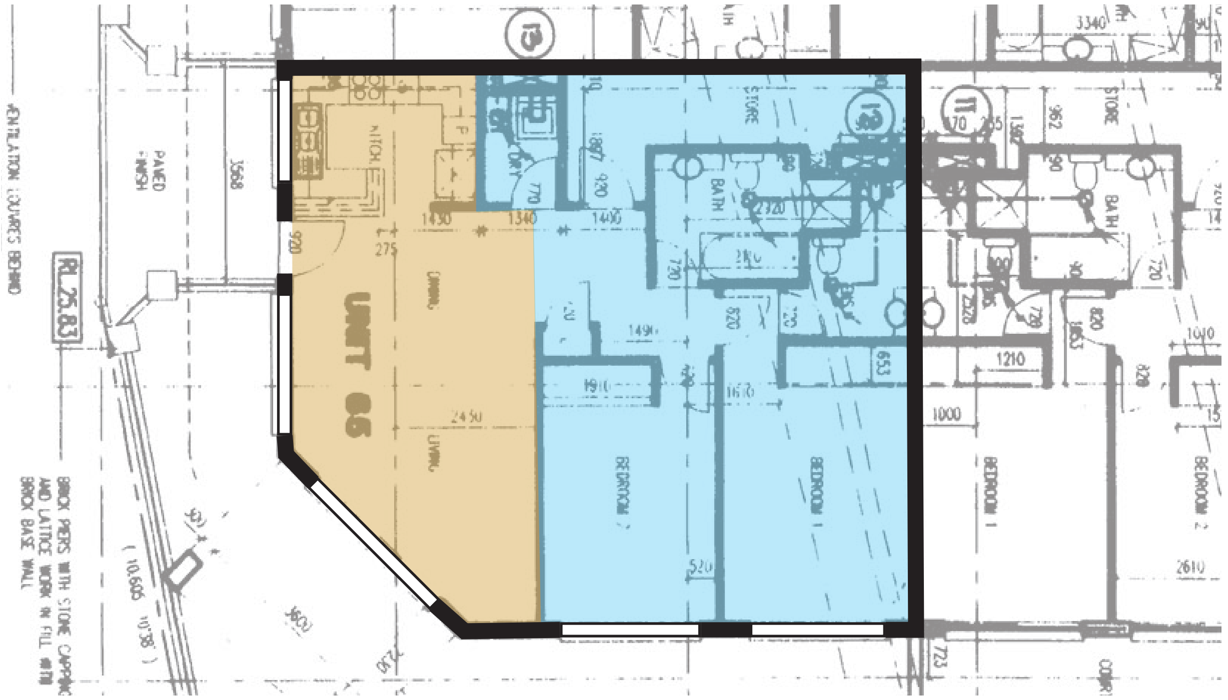


Level 3

IMPACT ON RESIDENTIAL BUILDING

37-61 GIBBONS STREET

Apartment 0.01



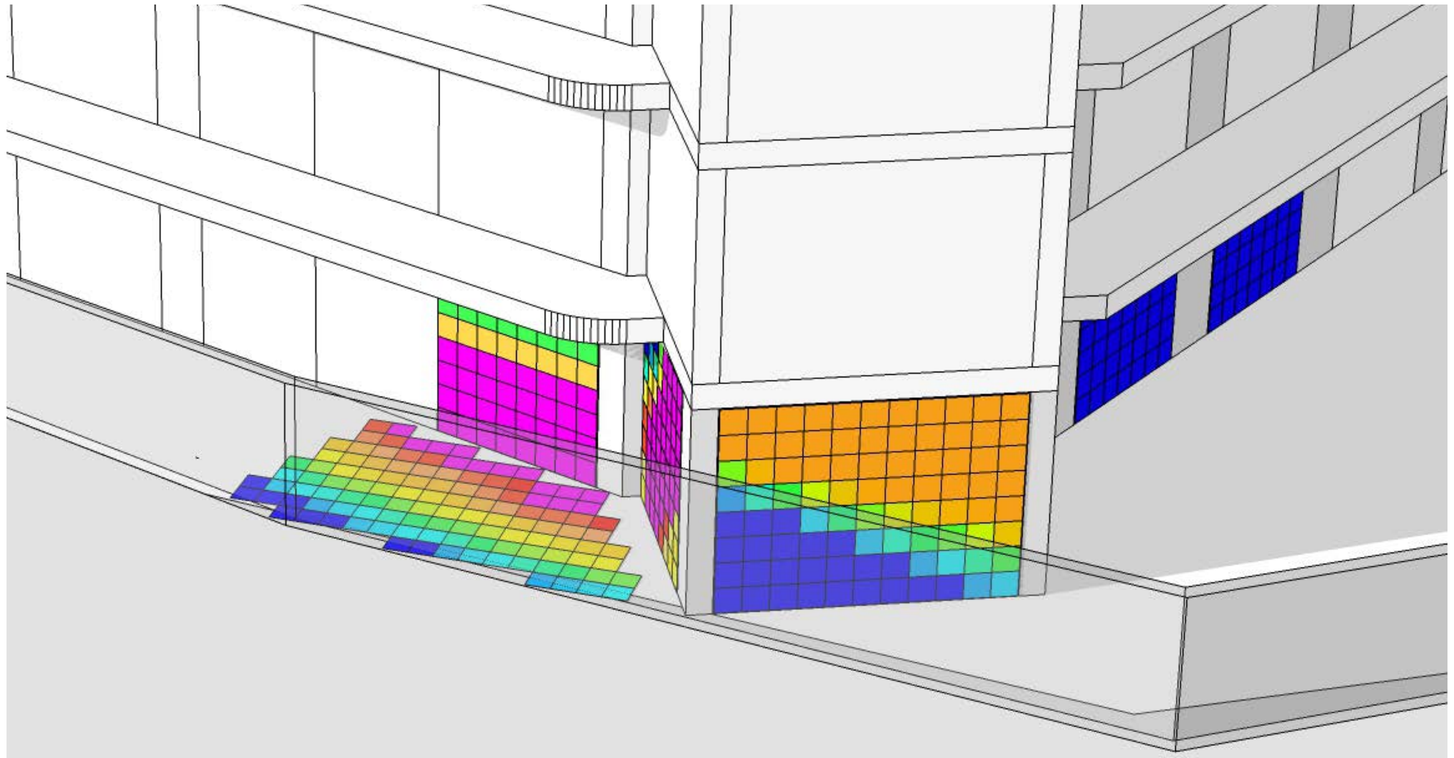
Living room

Bedroom

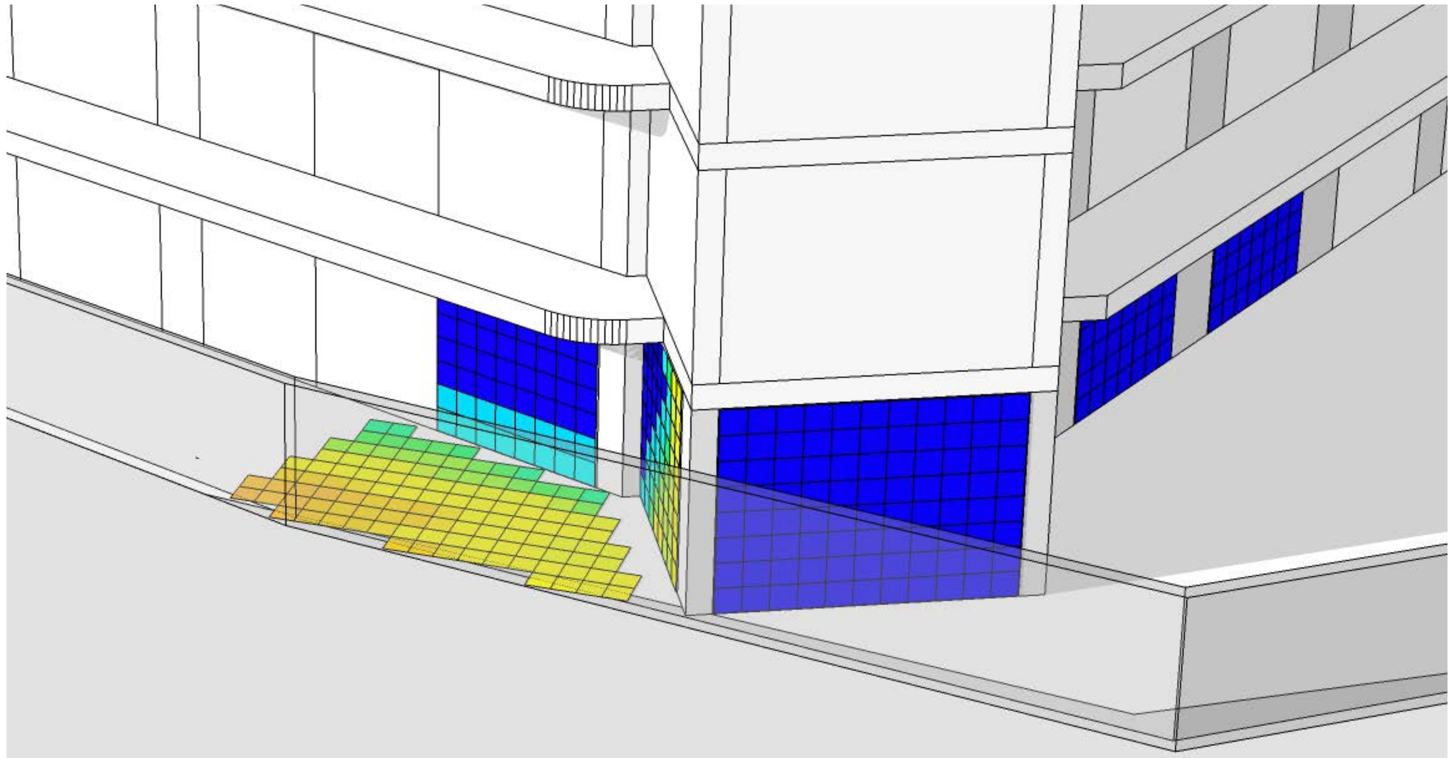
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed

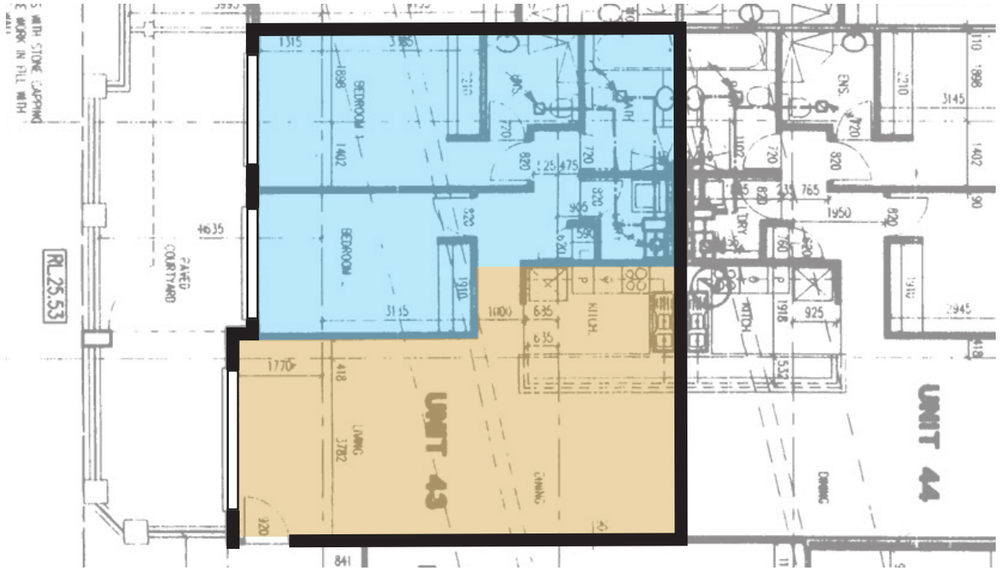


*Solar insulation analysis on habitable room windows generated at 15 min intervals.

IMPACT ON RESIDENTIAL BUILDING

37-61 GIBBONS STREET

Apartment 0.03



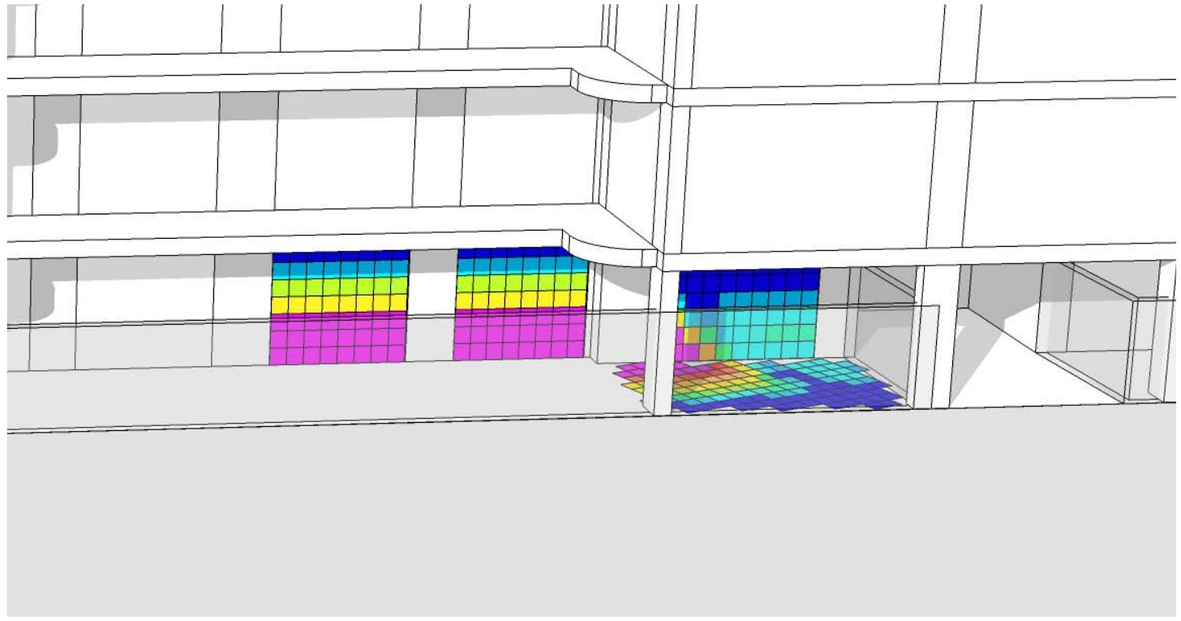
Living room

Bedroom

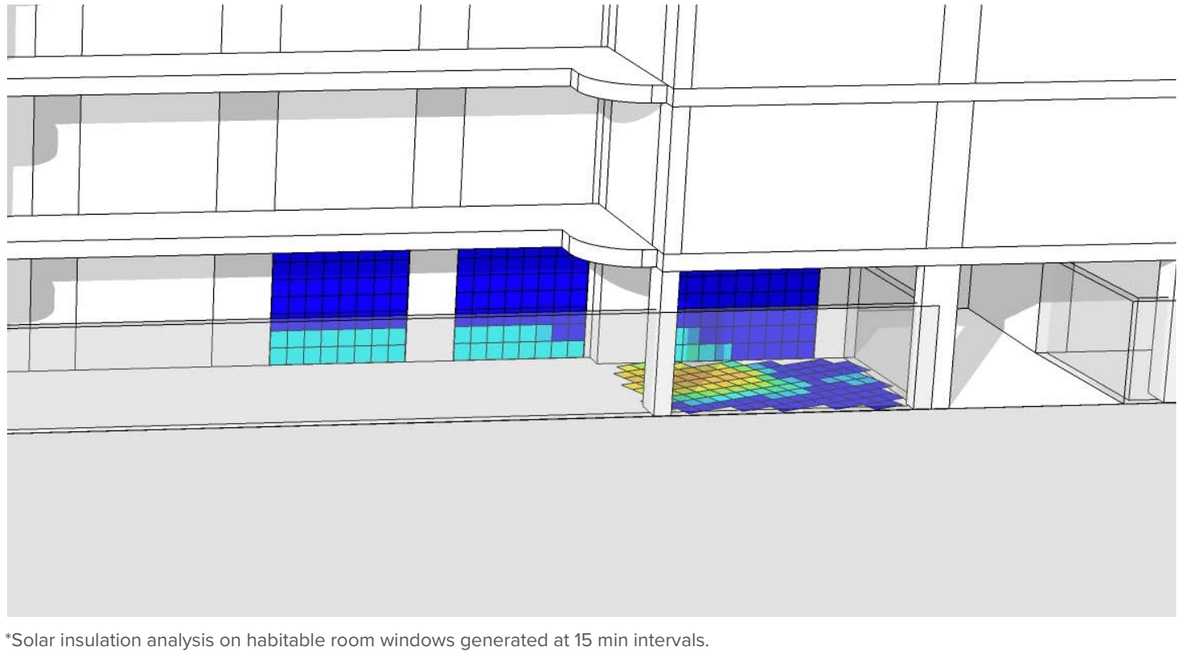
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed

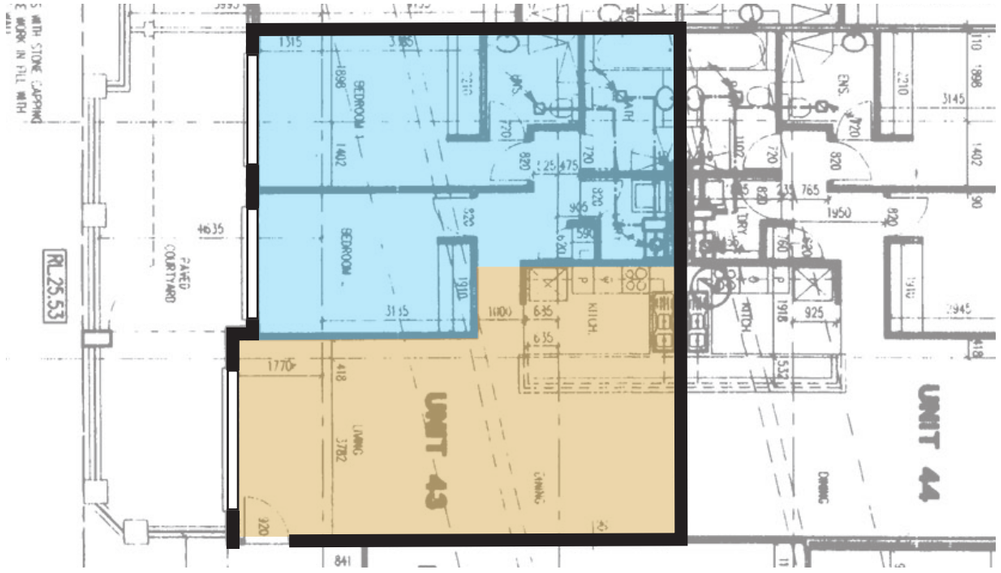


*Solar insulation analysis on habitable room windows generated at 15 min intervals.

IMPACT ON RESIDENTIAL BUILDING

37-61 GIBBONS STREET

Apartment 0.05

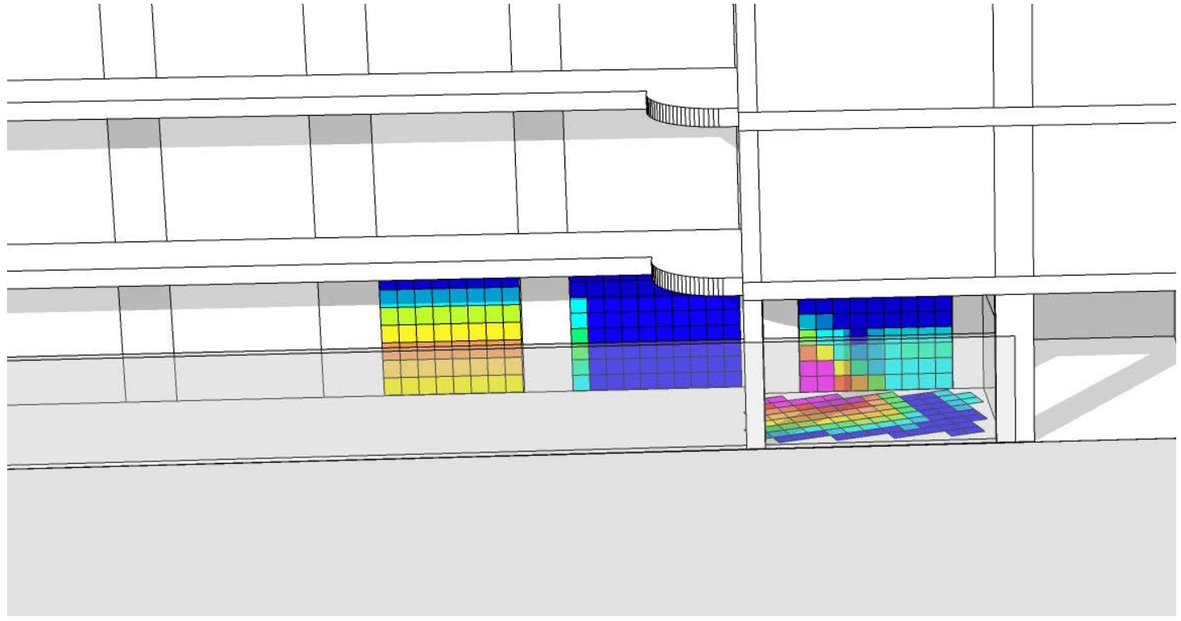


Living room Bedroom

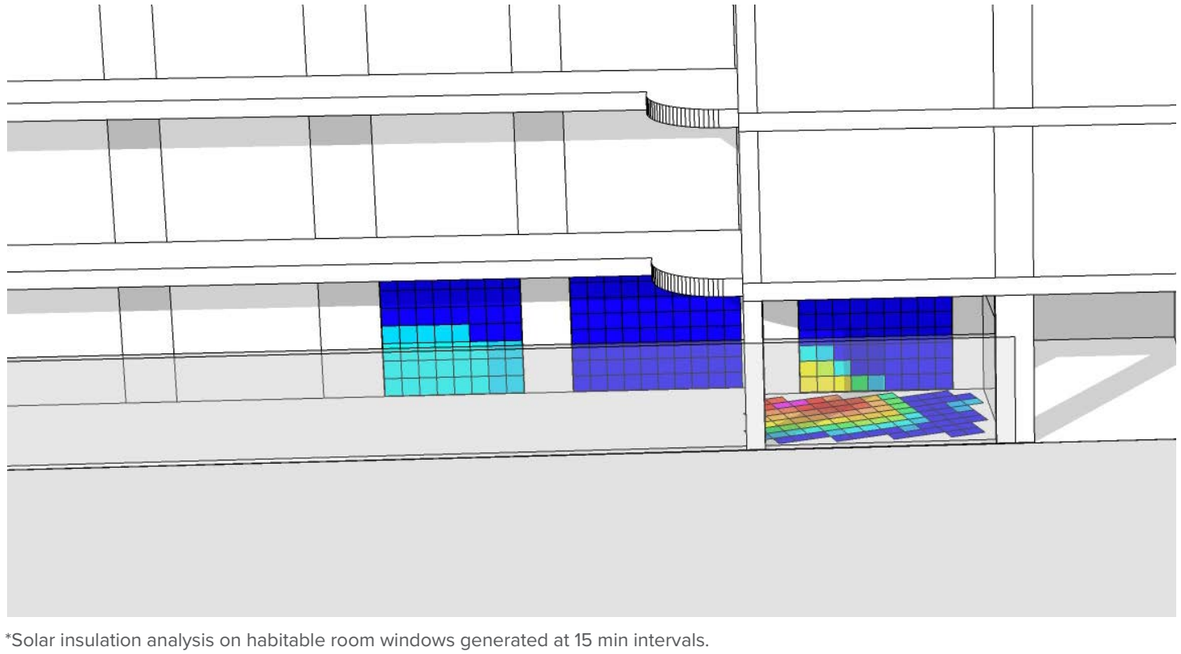
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed

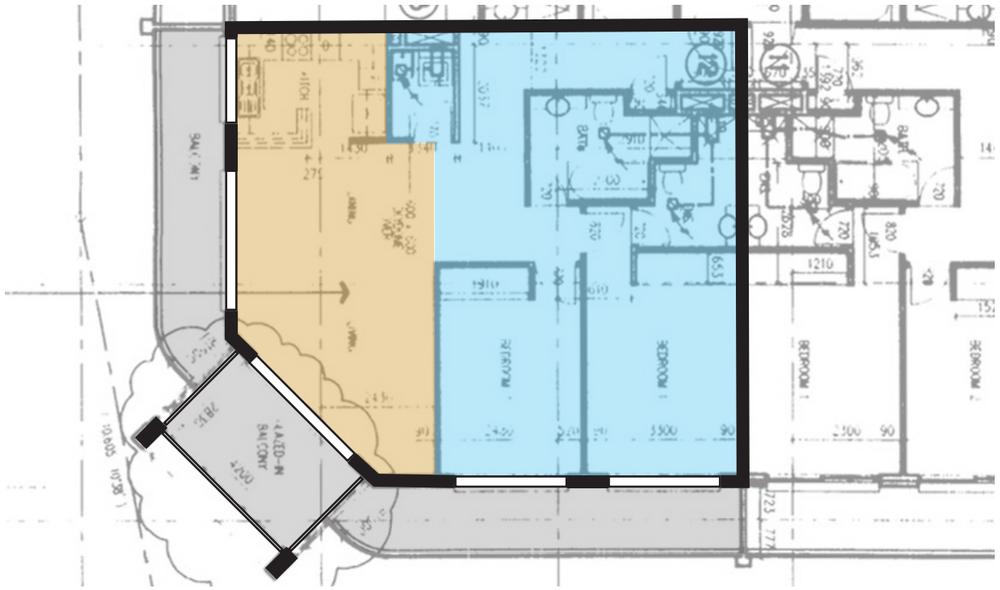


*Solar insulation analysis on habitable room windows generated at 15 min intervals.

IMPACT ON RESIDENTIAL BUILDING

37-61 GIBBONS STREET

Apartment 1.24



Living room

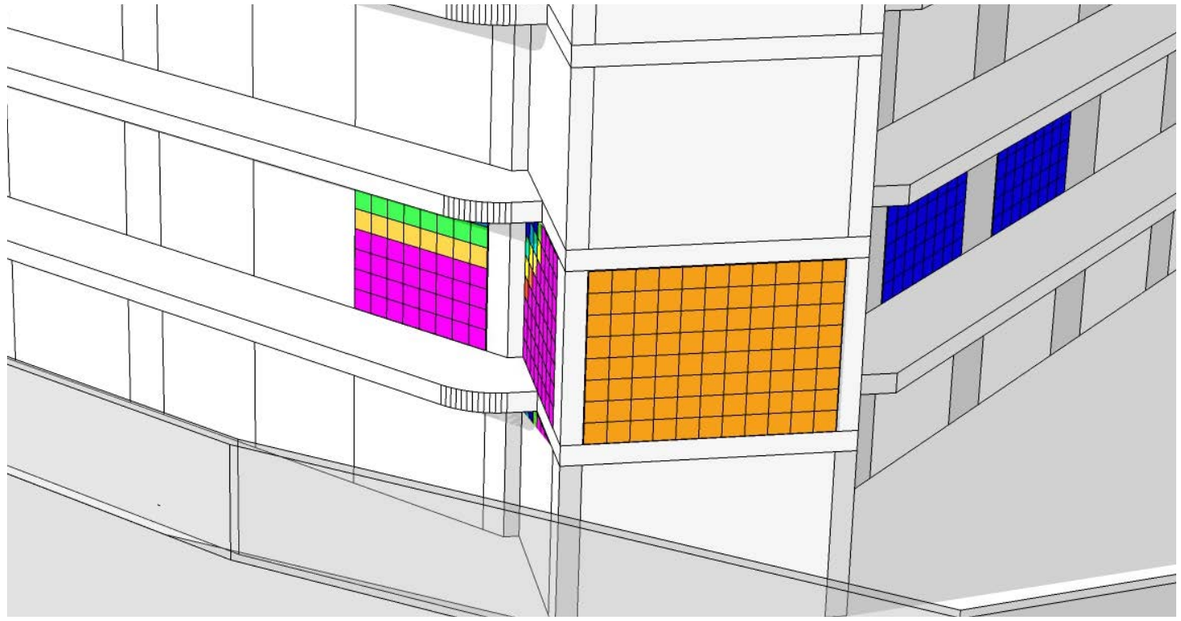
Bedroom

Private Open Space

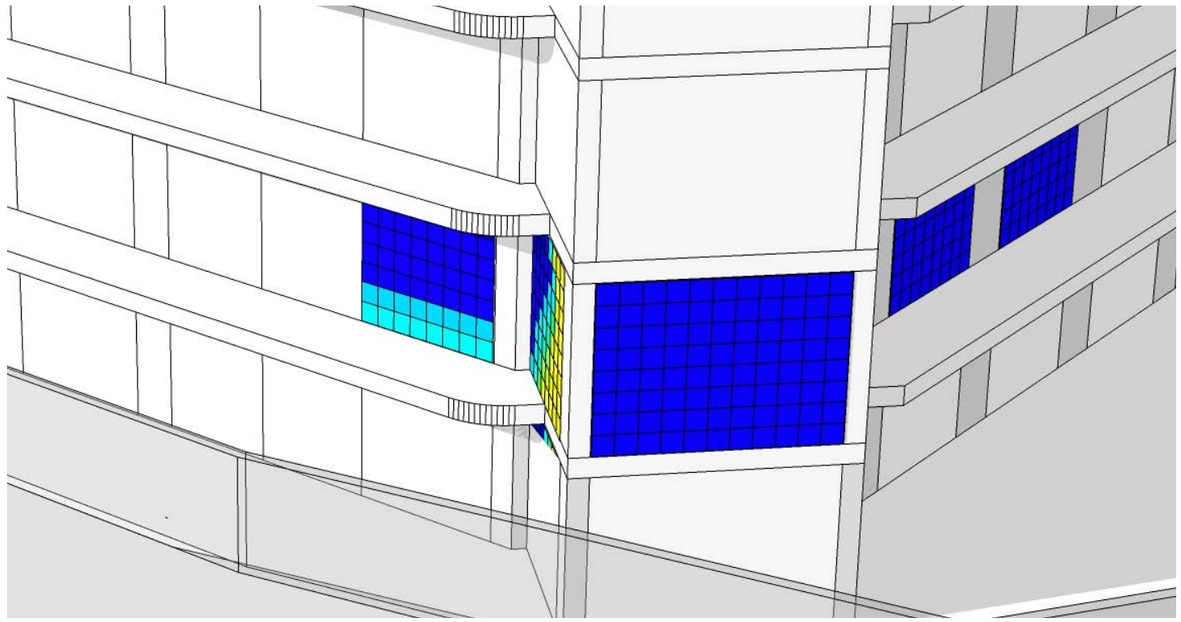
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed

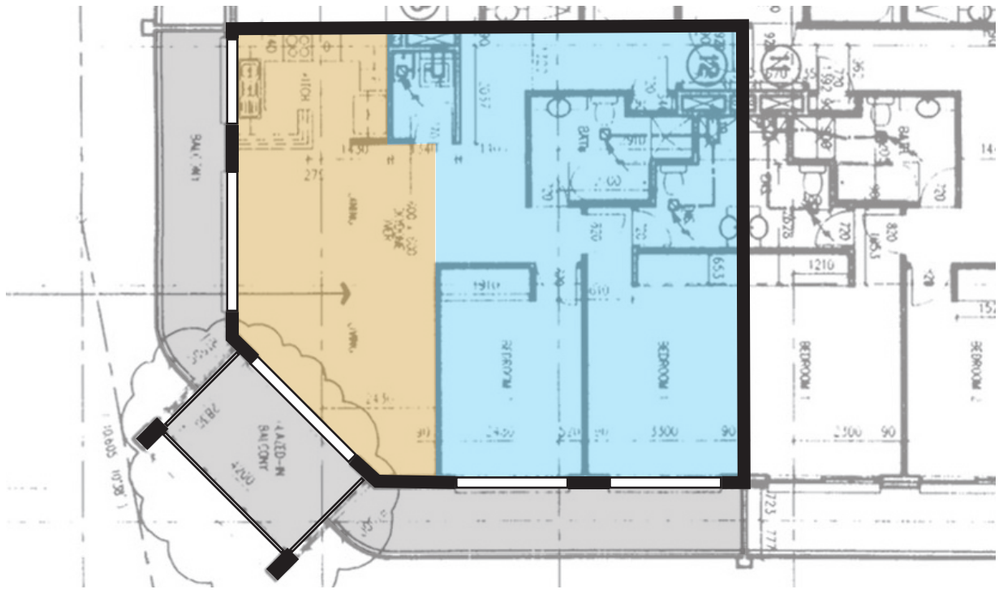


*Solar insulation analysis on habitable room windows generated at 15 min intervals.

IMPACT ON RESIDENTIAL BUILDING

37-61 GIBBONS STREET

Apartment 2.41



Living room

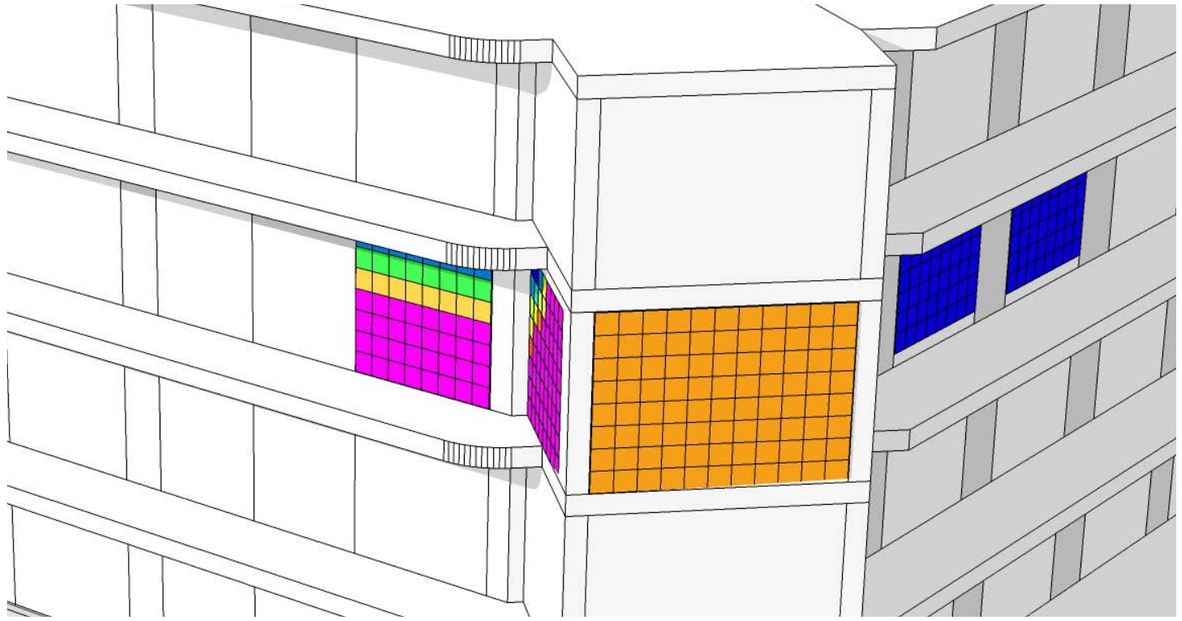
Bedroom

Private Open Space

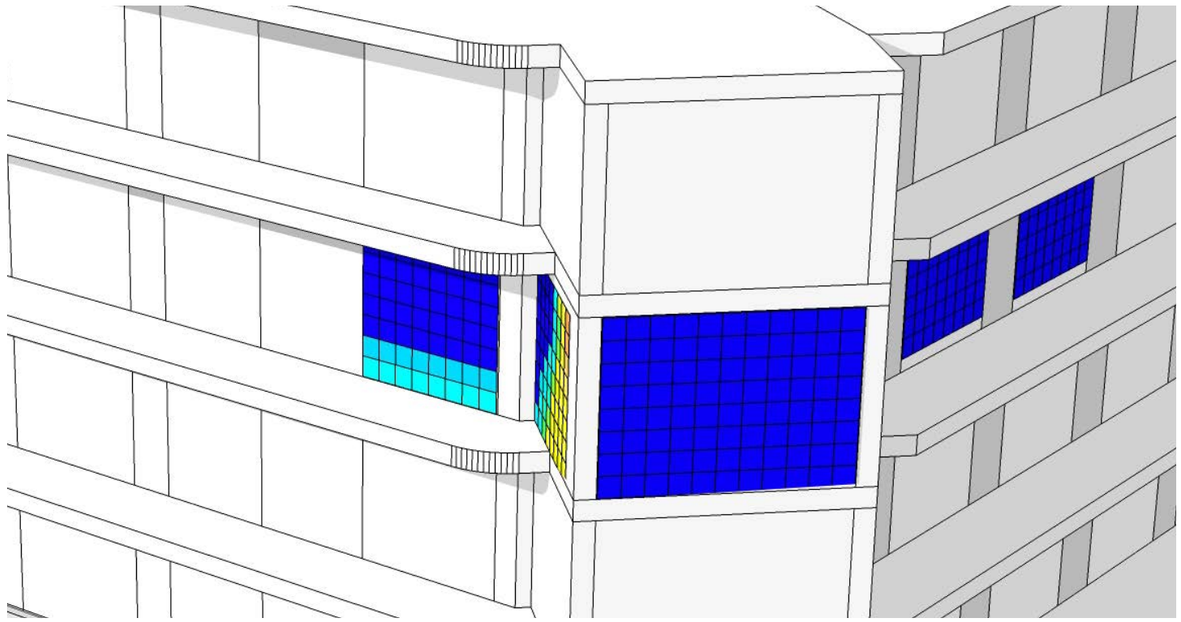
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed

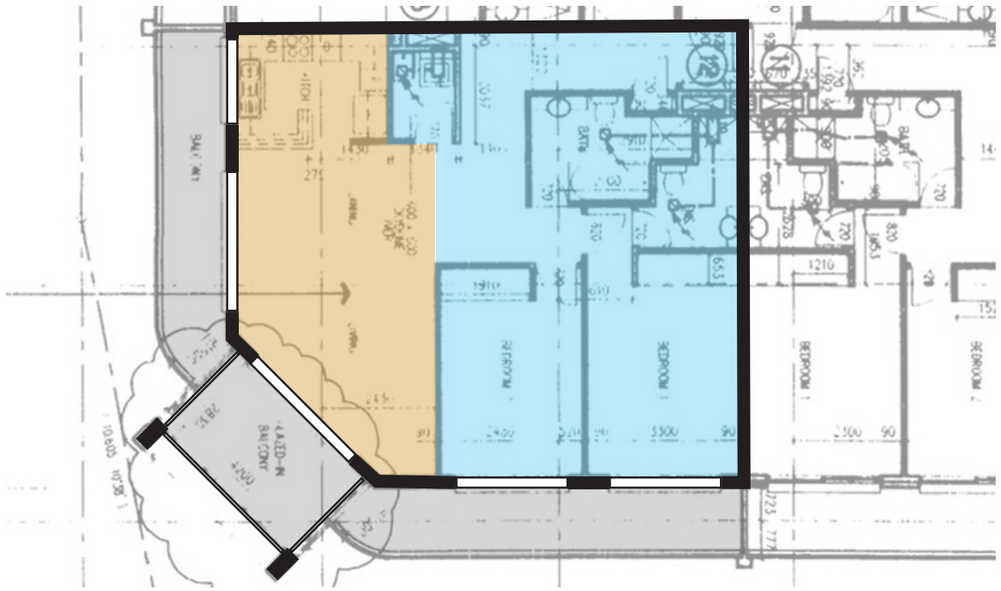


*Solar insulation analysis on habitable room windows generated at 15 min intervals.

IMPACT ON RESIDENTIAL BUILDING

37-61 GIBBONS STREET

Apartment 3.58



Living room

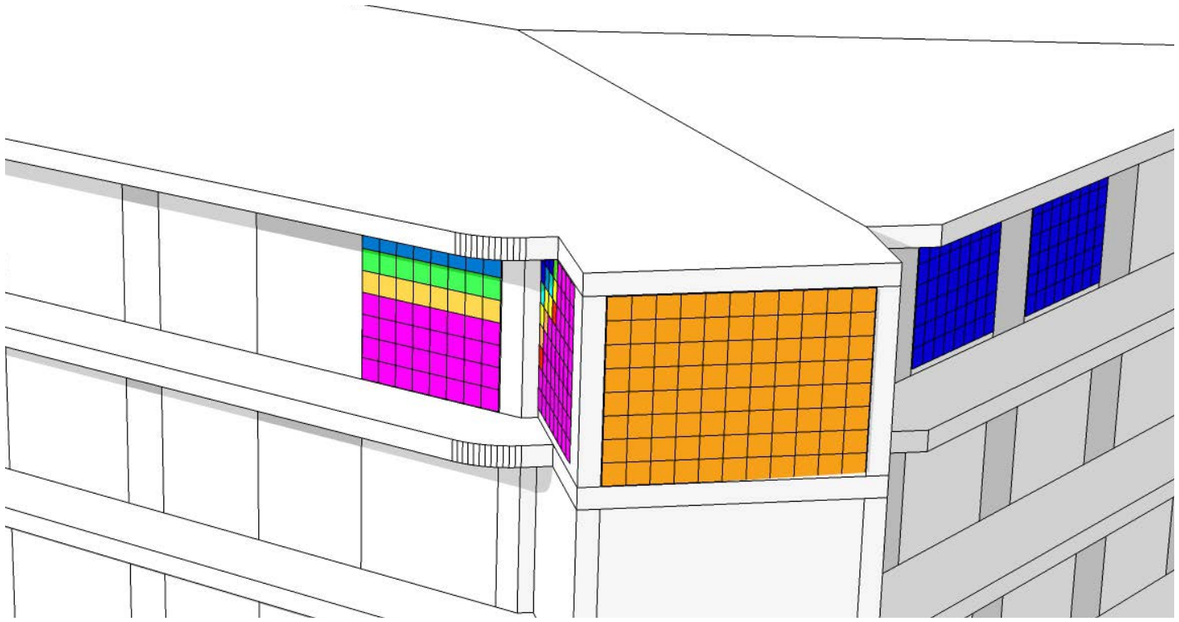
Bedroom

Private Open Space

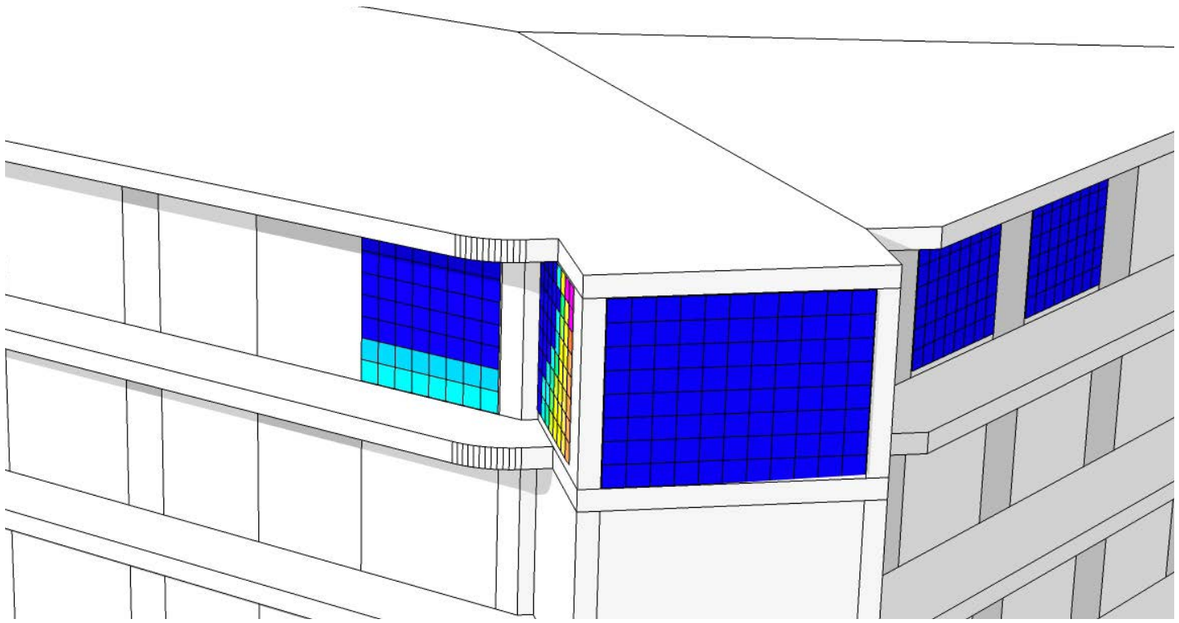
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed



*Solar insulation analysis on habitable room windows generated at 15 min intervals.

IMPACT ON RESIDENTIAL BUILDING

10-20 GARDENS STREET

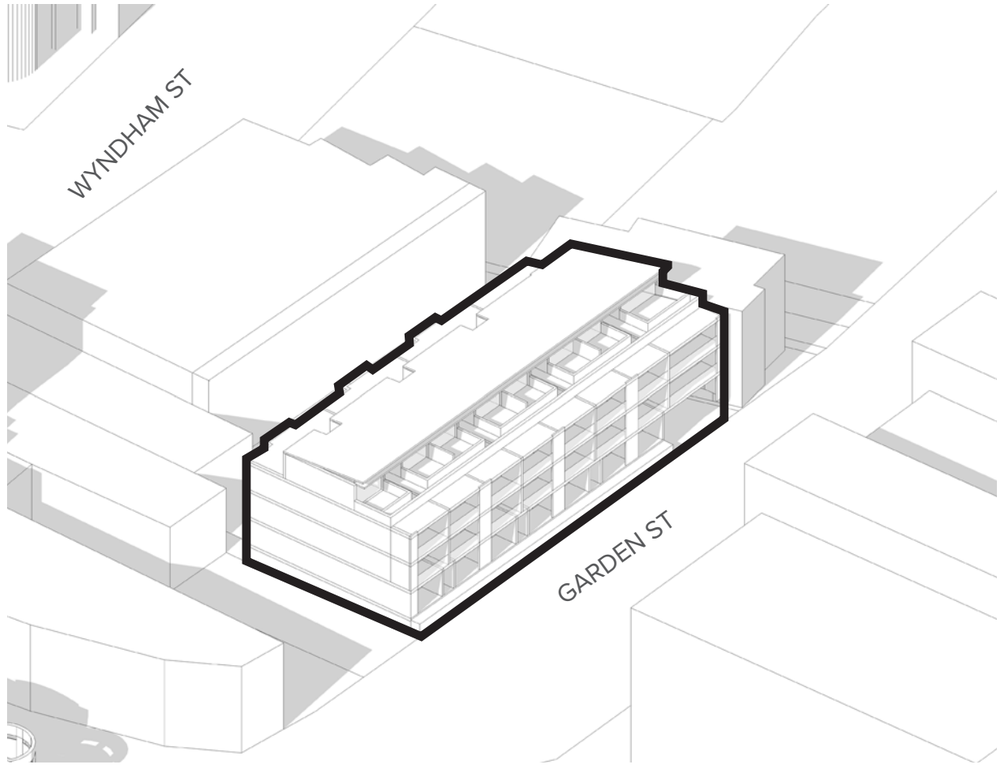
Observation:

The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion. However, there is a minor impact of approximately 1 hour for the bedrooms facing the rear property boundary. It is noted these bedrooms currently use sun blinds etc. to improve sleeping conditions. It addition, it is noted the apartment age means it is a likely redevelopment site over the medium term.

The proposal is considered appropriate in terms of its solar impact on this building. There is no impact on outdoor space and living space, and only a minor impact of bedrooms that is considered acceptable.

Building Aerial View

Axonometric View



IMPACT ON RESIDENTIAL BUILDING

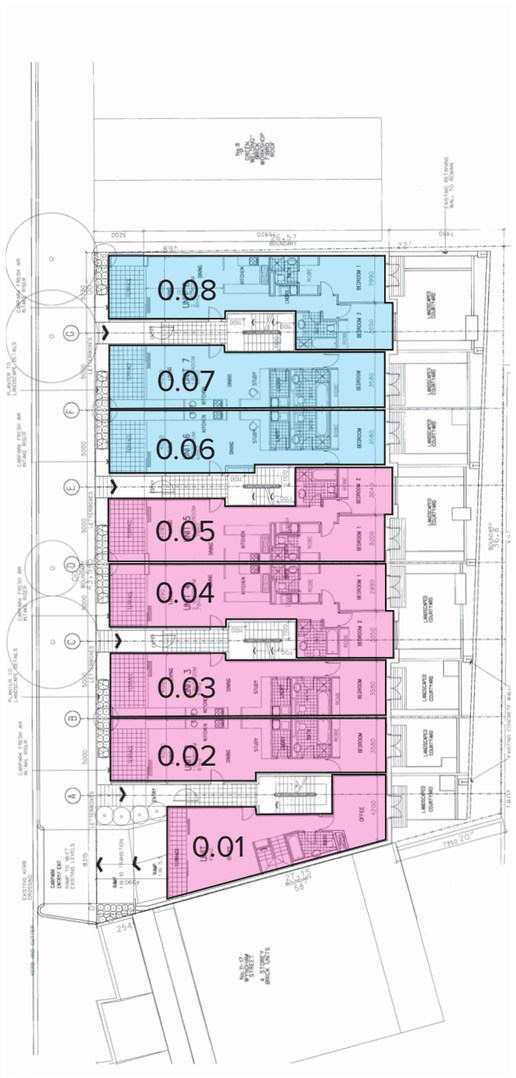
10-20 GARDENS STREET

EXISTING 11/23 Compliant

Building Floor Plans

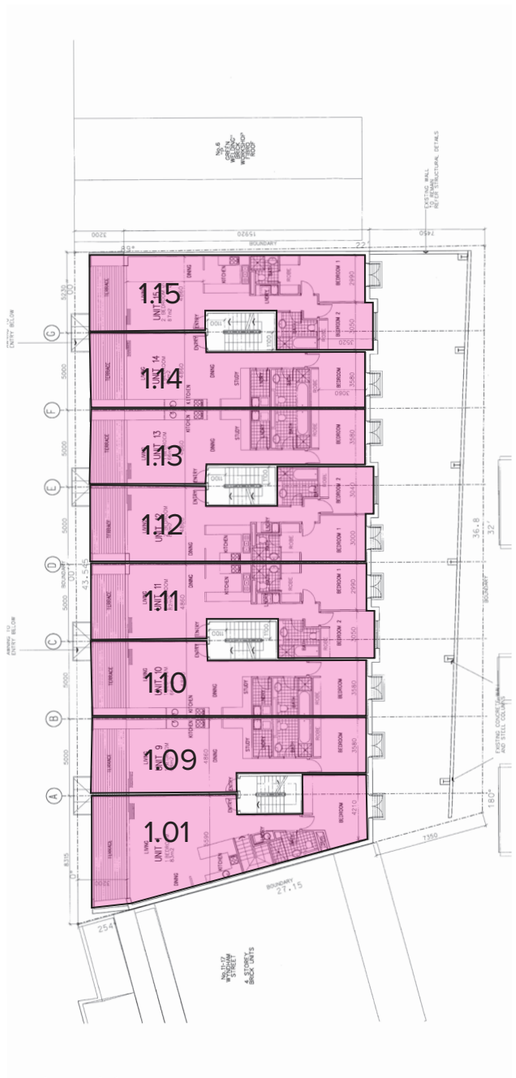
Compliant Situation

Non-compliant Situation



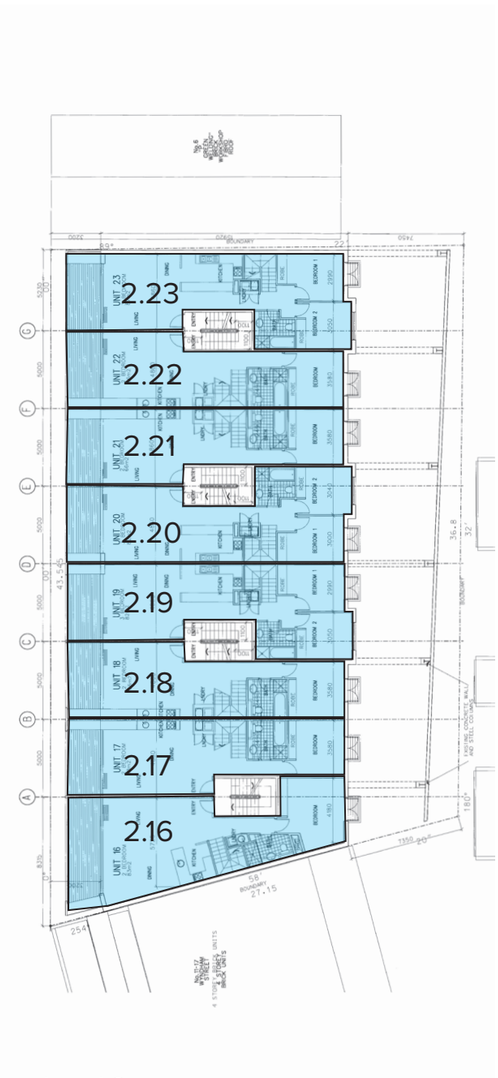
Ground Floor

N NTS



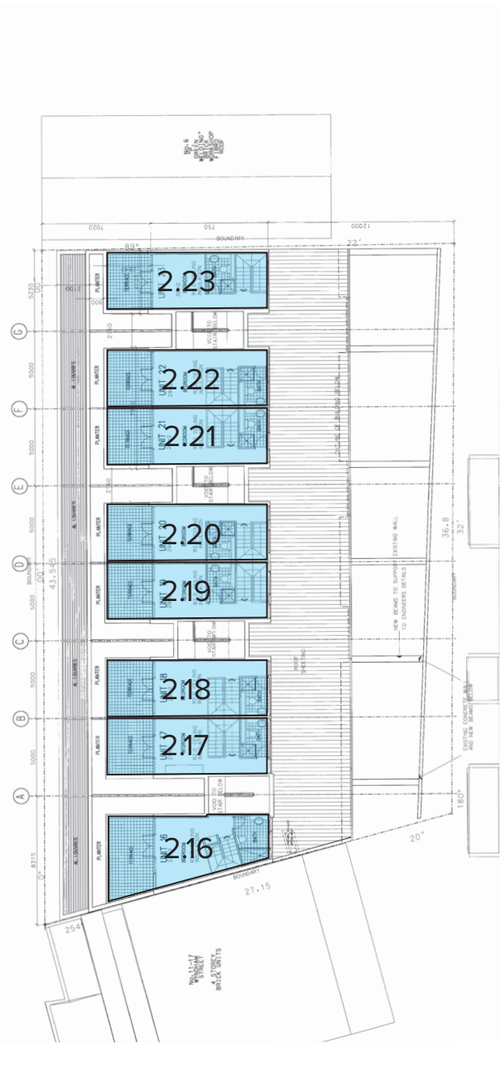
Level 1

N NTS



Level 2

N NTS



Level 3

N NTS

IMPACT ON RESIDENTIAL BUILDING

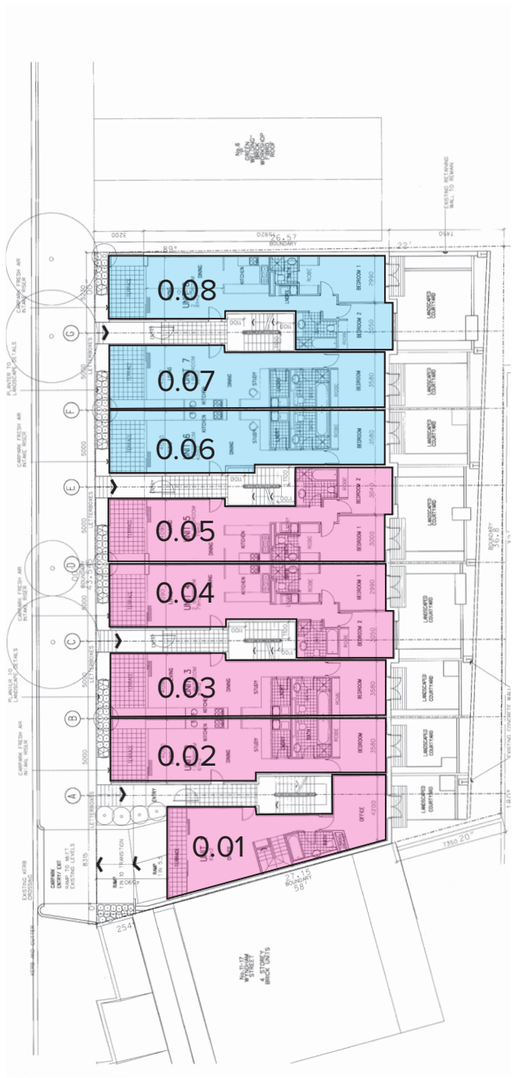
10-20 GARDENS STREET

PROPOSED 11/23 Compliant

Building Floor Plans

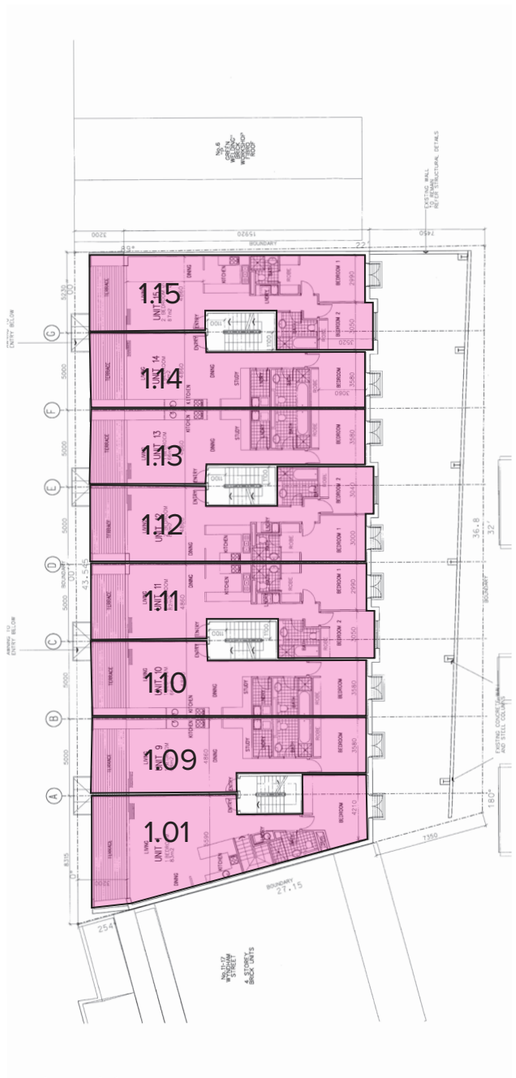
Compliant Situation

Non-compliant Situation



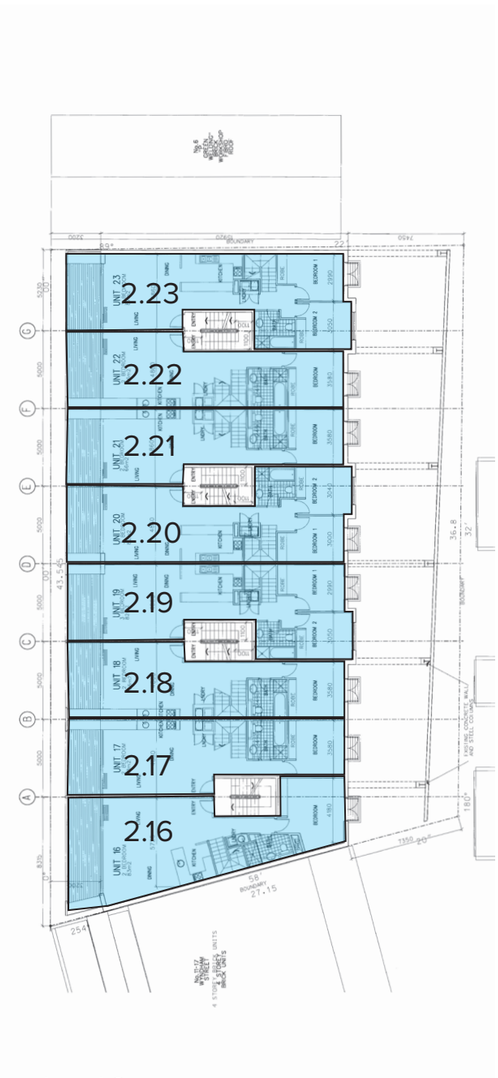
Ground Floor

N NTS



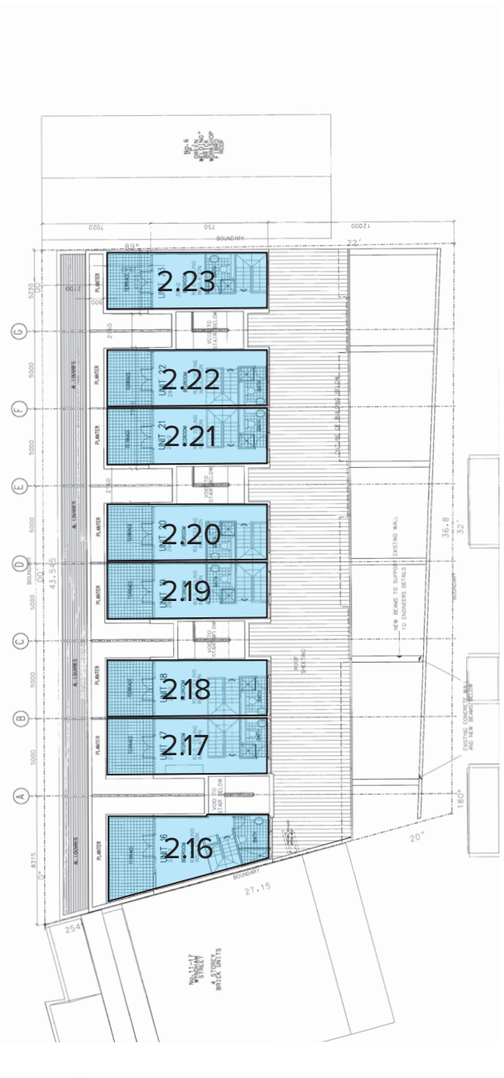
Level 1

N NTS



Level 2

N NTS

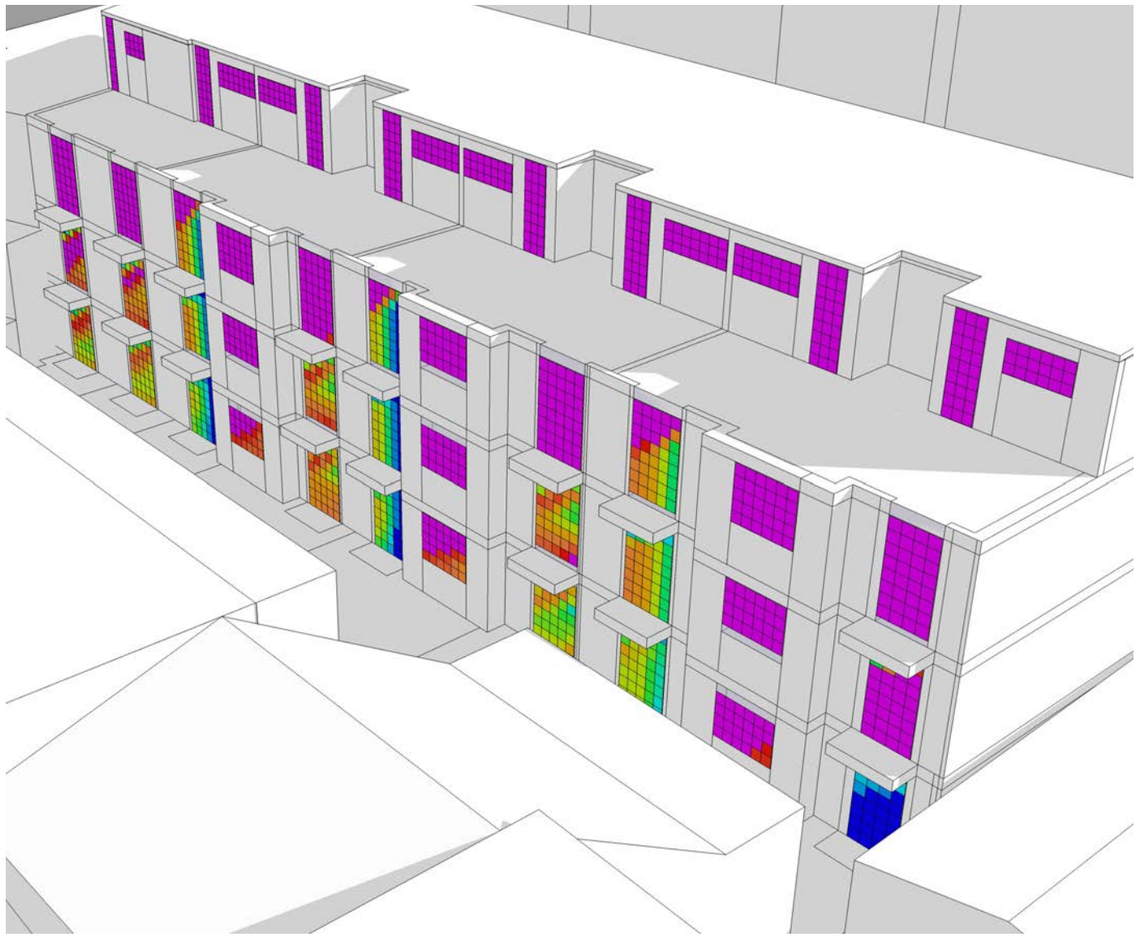


Level 3

N NTS

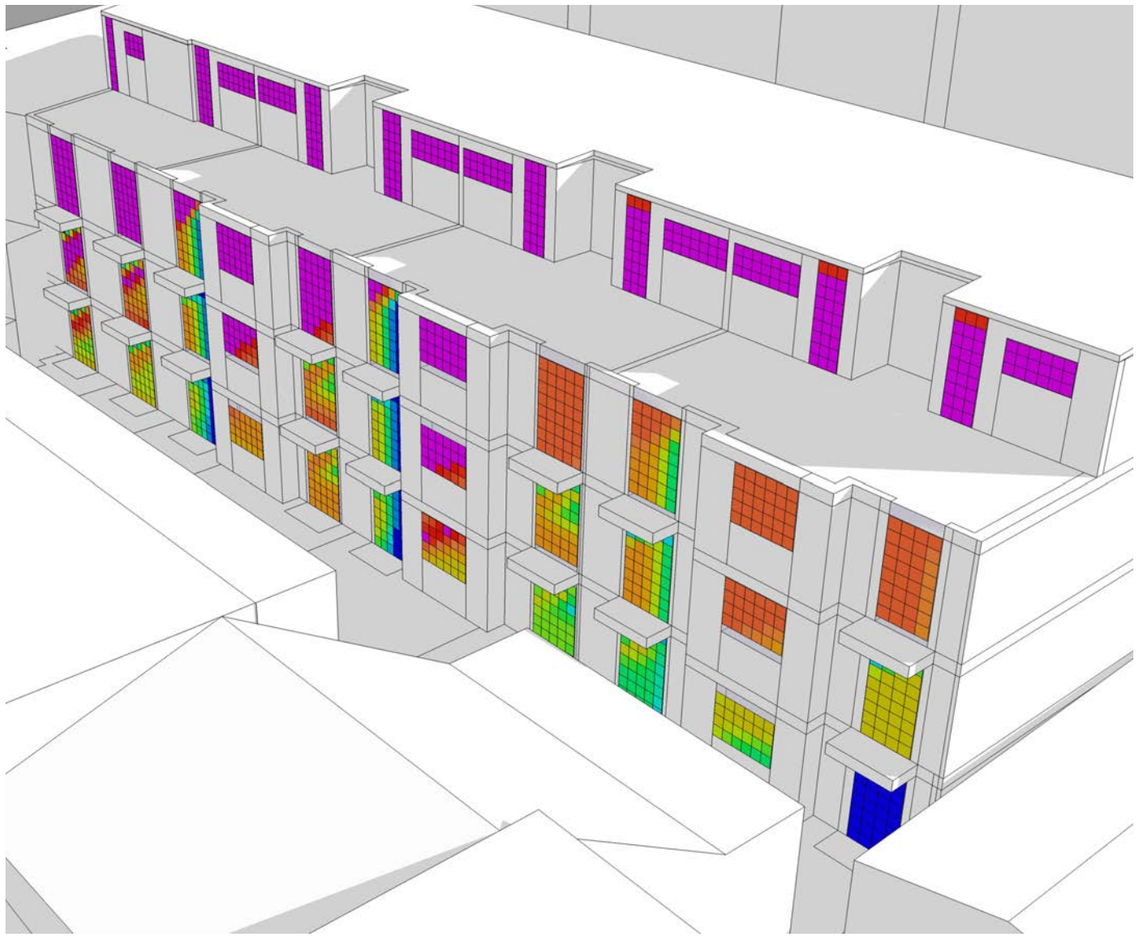
IMPACT ON RESIDENTIAL BUILDING

10-20 GARDENS STREET



Shadow Assessment Existing

*Solar insulation analysis on habitable room windows generated at 15 min intervals.



Shadow Assessment Proposed

*Solar insulation analysis on habitable room windows generated at 15 min intervals.

Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

IMPACT ON RESIDENTIAL BUILDING

2 BOTANY ROAD

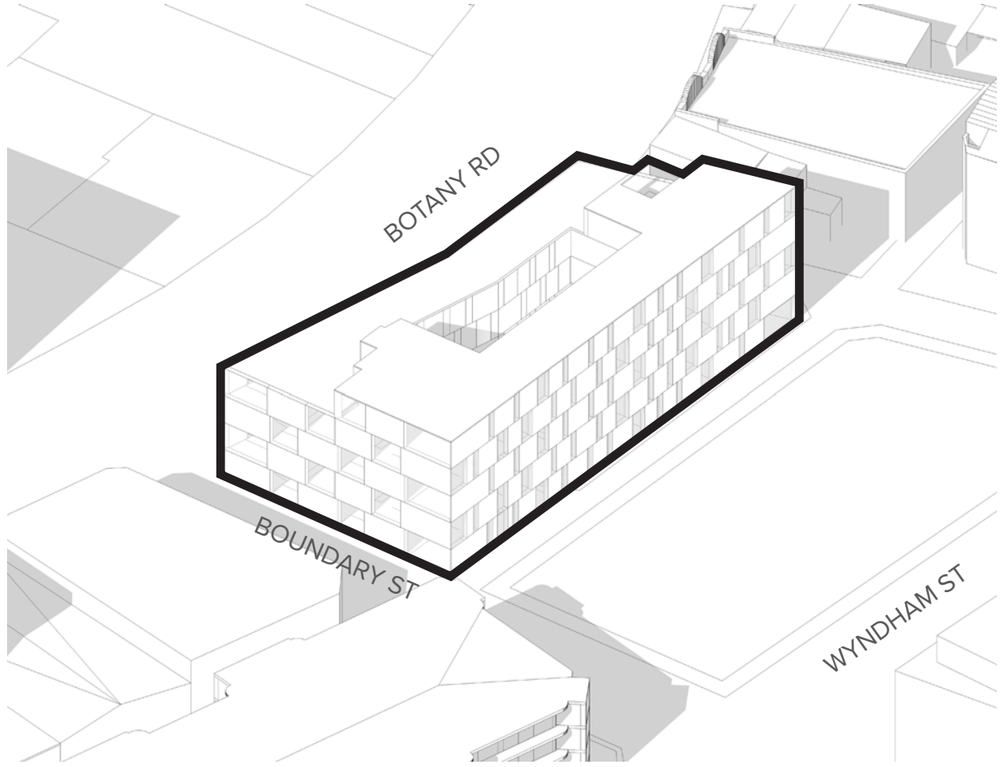
Observation:

The proposal has a minor impact on the solar amenity of the existing building, being a total of 3 apartments. With all 3 impacted apartments being orientated north-west, the impact is the result of an internal design with private open space and elevation treatment that could have been improved and this impact would not exist. Nonetheless, all 3 apartments still receive approximately 1.5hrs sunlight that is considered acceptable within an urban renewal context.

The proposal is considered appropriate in terms of its solar impact on this building.

Building Aerial View

Axonometric View



IMPACT ON RESIDENTIAL BUILDING

2 BOTANY ROAD

EXISTING 30/44 Compliant

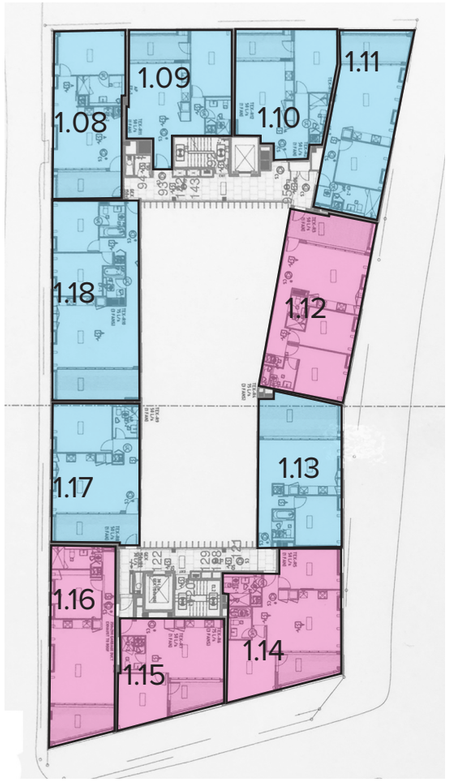
Building Floor Plans

Compliant Situation

Non-compliant Situation

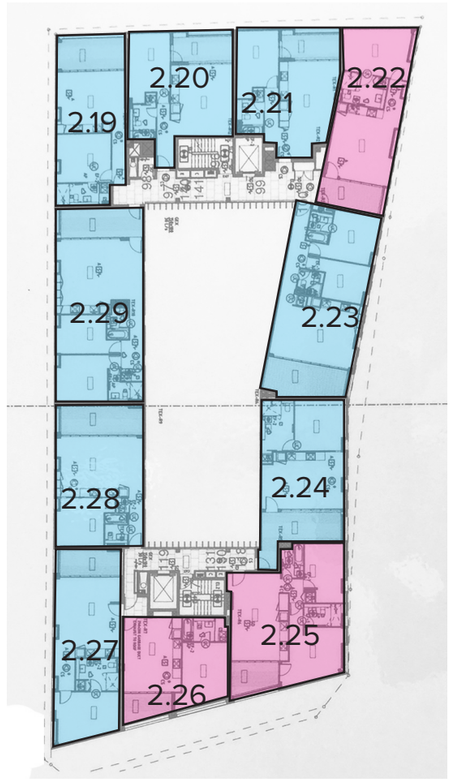
Ground Floor

N NTS



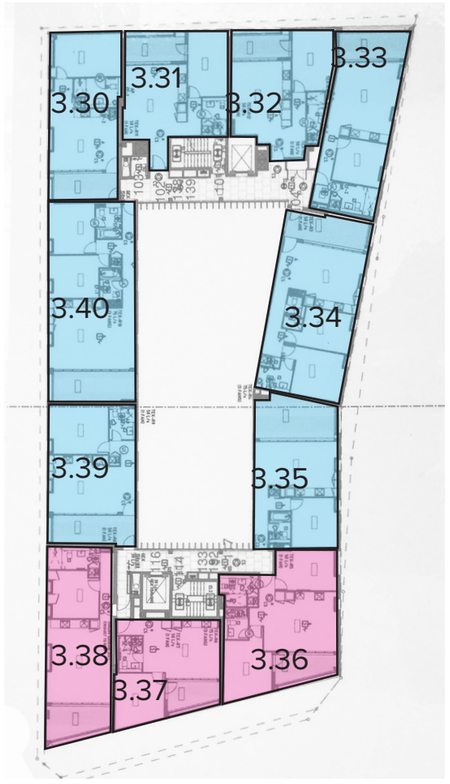
Level 1

N NTS



Level 2

N NTS



Level 3

N NTS

Level 4

N NTS

IMPACT ON RESIDENTIAL BUILDING

2 BOTANY ROAD

PROPOSED 27/44 Compliant

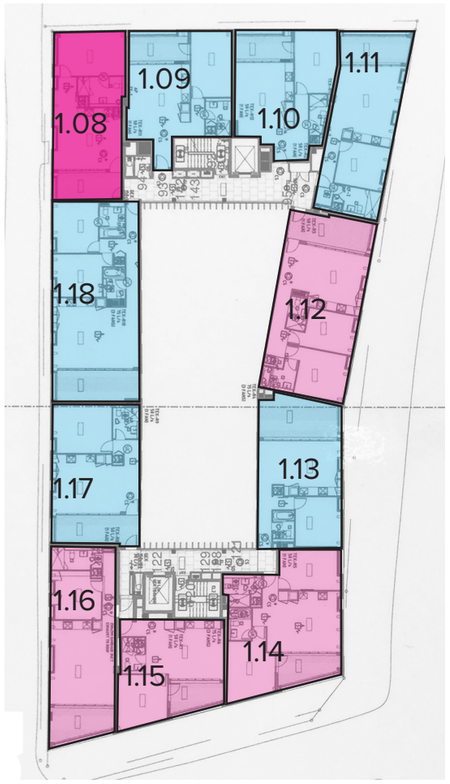
Building Floor Plans

Compliant Situation

Non-compliant Situation

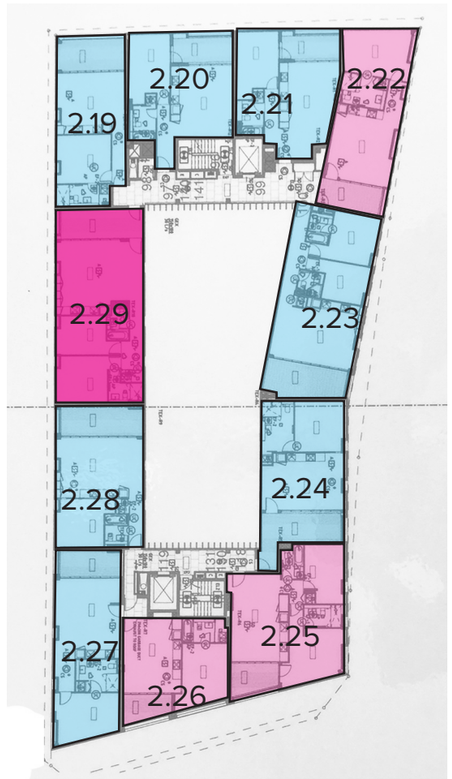
Ground Floor

N NTS



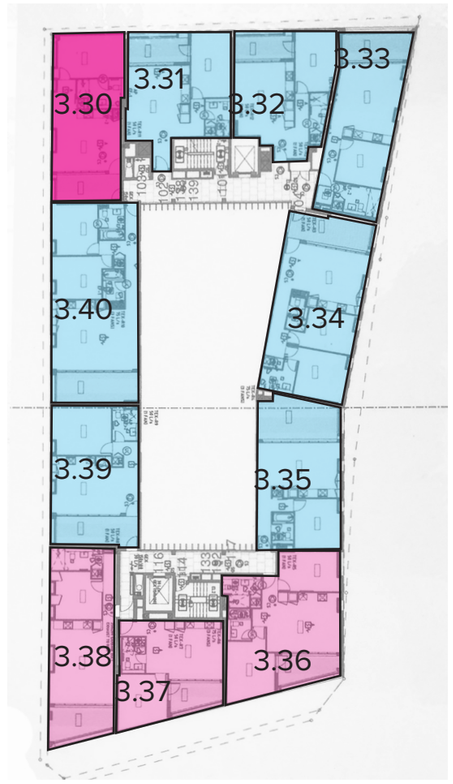
Level 1

N NTS



Level 2

N NTS



Level 3

N NTS

Level 4

N NTS

IMPACT ON RESIDENTIAL BUILDING

2 BOTANY ROAD

Apartment 1.08

Living room

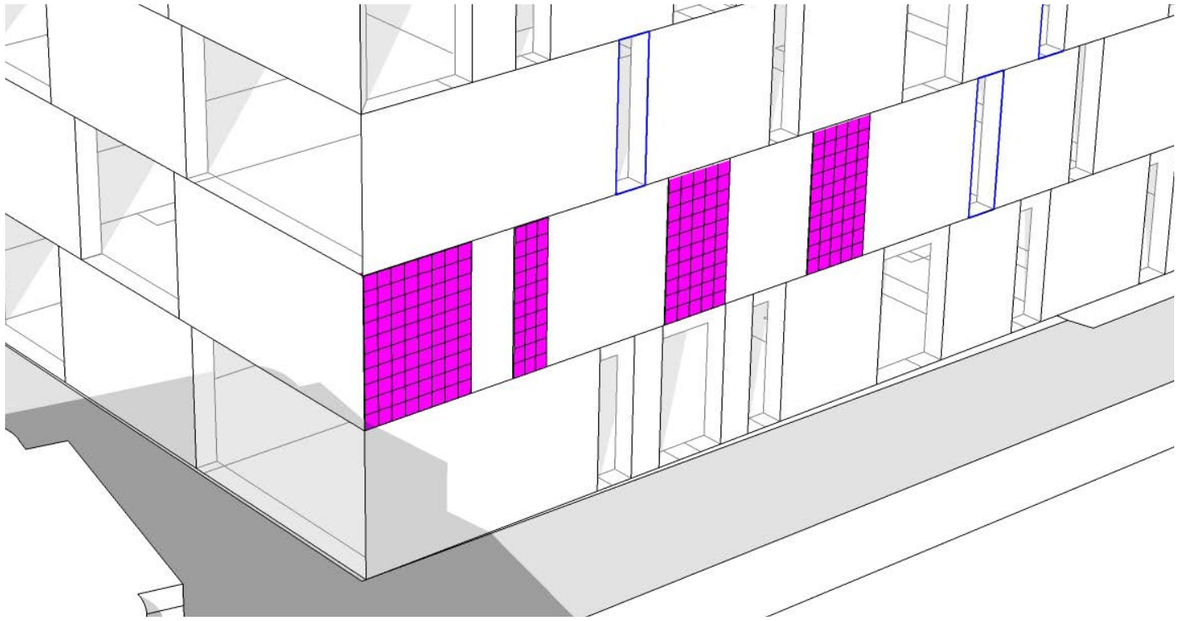
Bedroom

Private Open Space

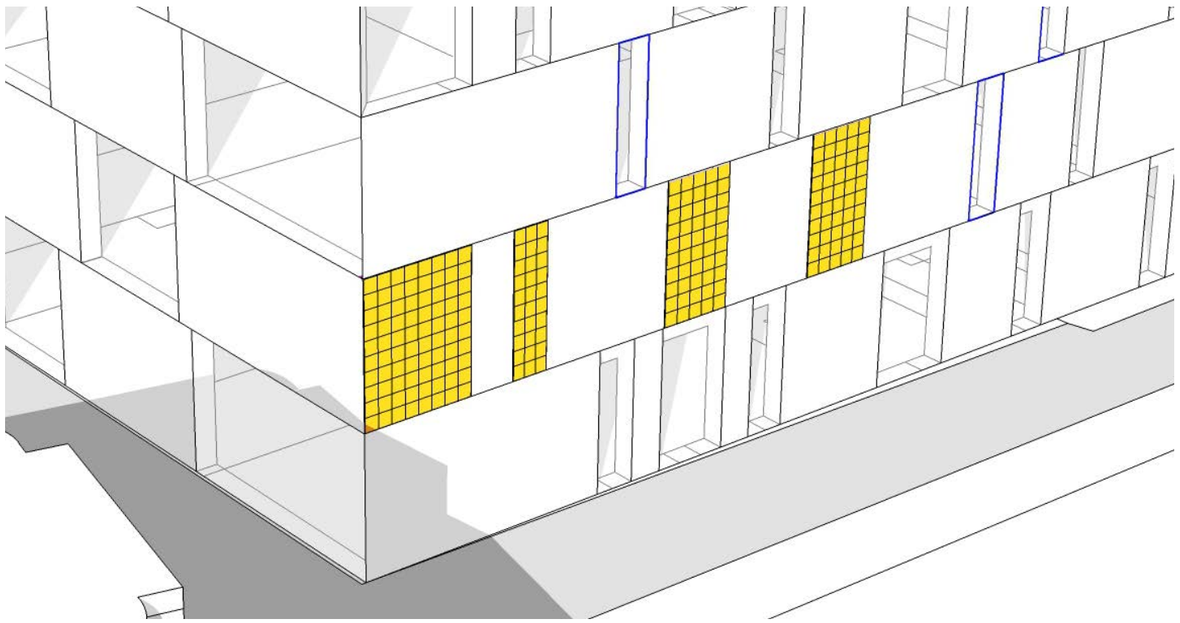
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed



*Solar insulation analysis on habitable room windows generated at 15 min intervals.

IMPACT ON RESIDENTIAL BUILDING

2 BOTANY ROAD

Apartment 2.29

Living room

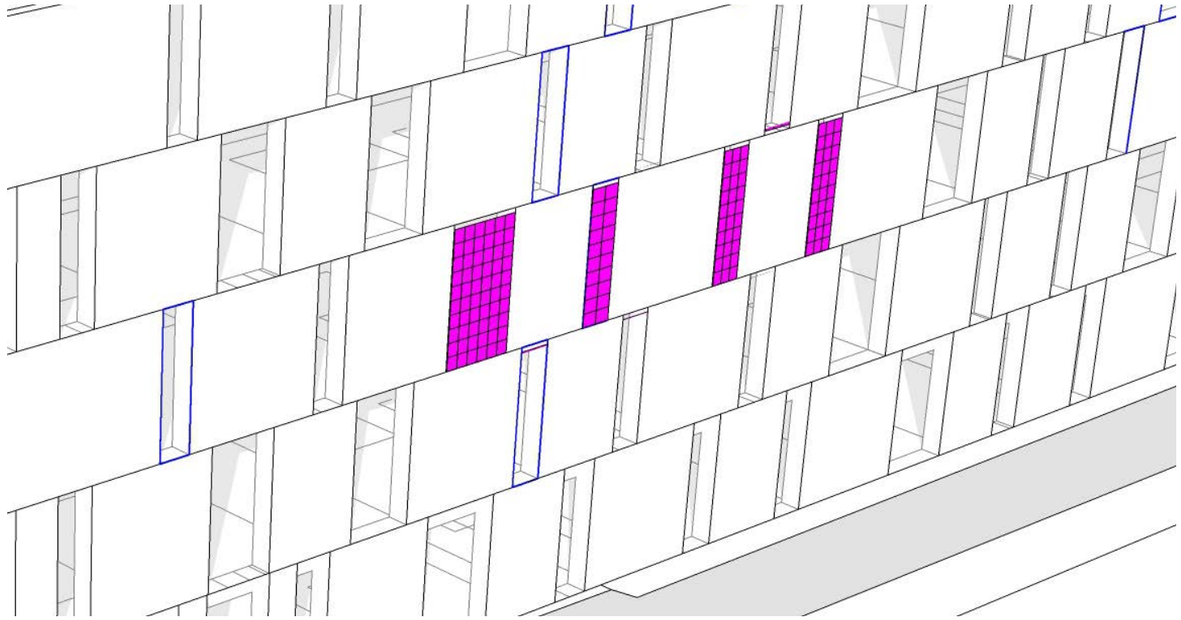
Bedroom

Private Open Space

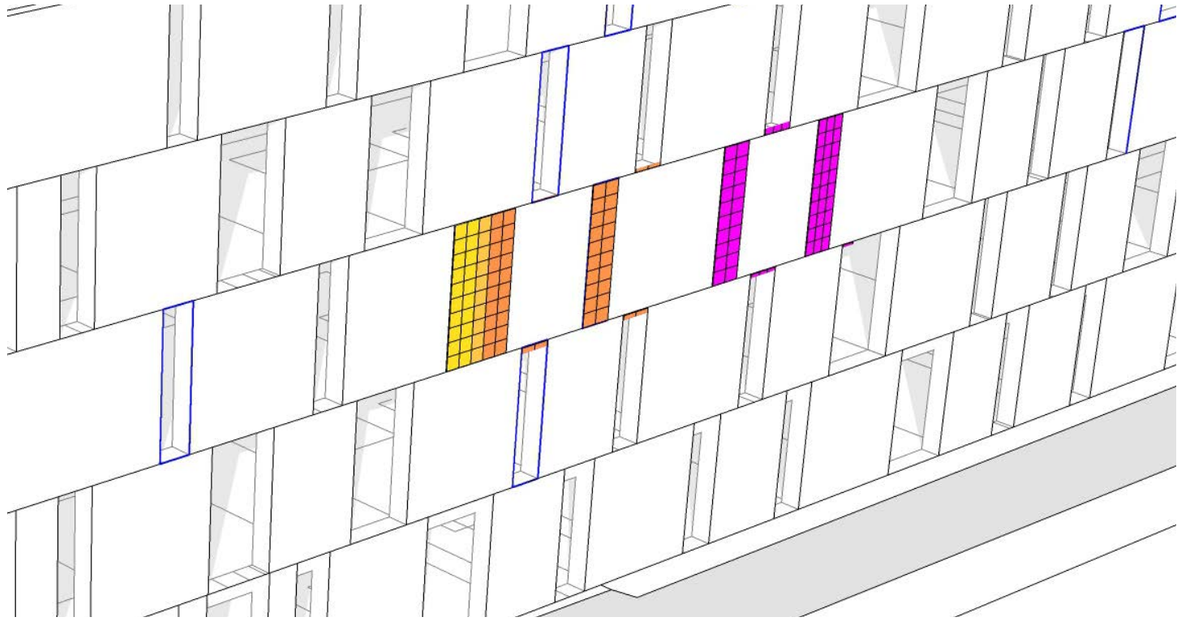
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed



IMPACT ON RESIDENTIAL BUILDING

2 BOTANY ROAD

Apartment 3.30

Living room

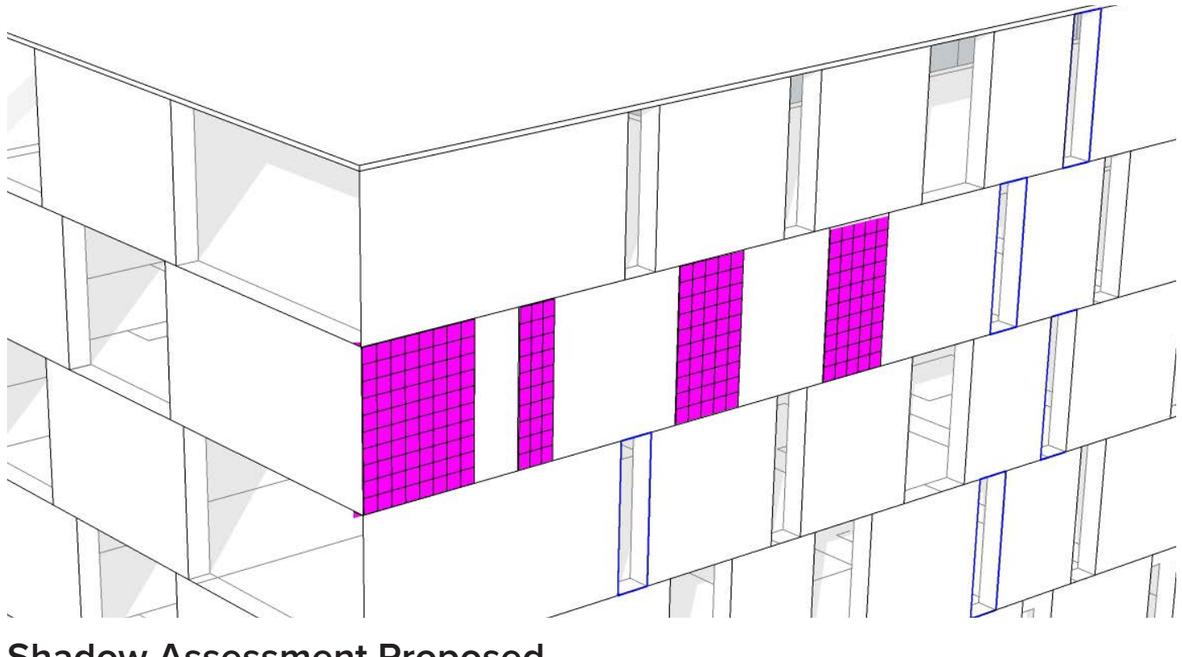
Bedroom

Private Open Space

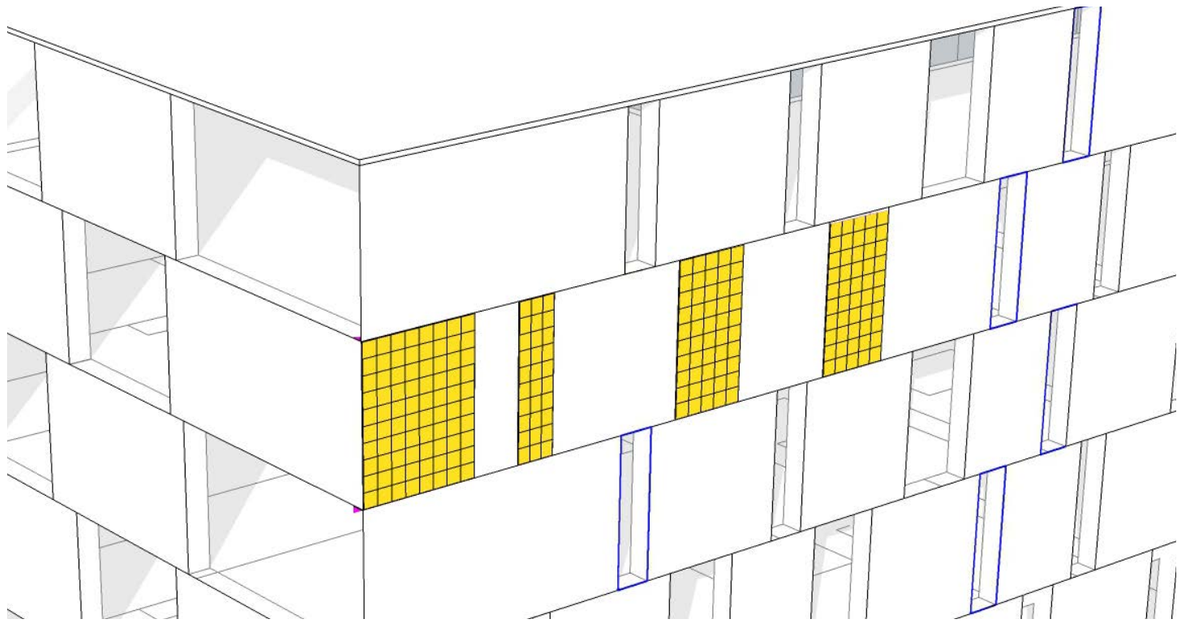
Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min

Shadow Assessment Existing



Shadow Assessment Proposed



*Solar insulation analysis on habitable room windows generated at 15 min intervals.

IMPACT ON RESIDENTIAL BUILDING

31 CORNWALLIS STREET

Observation:

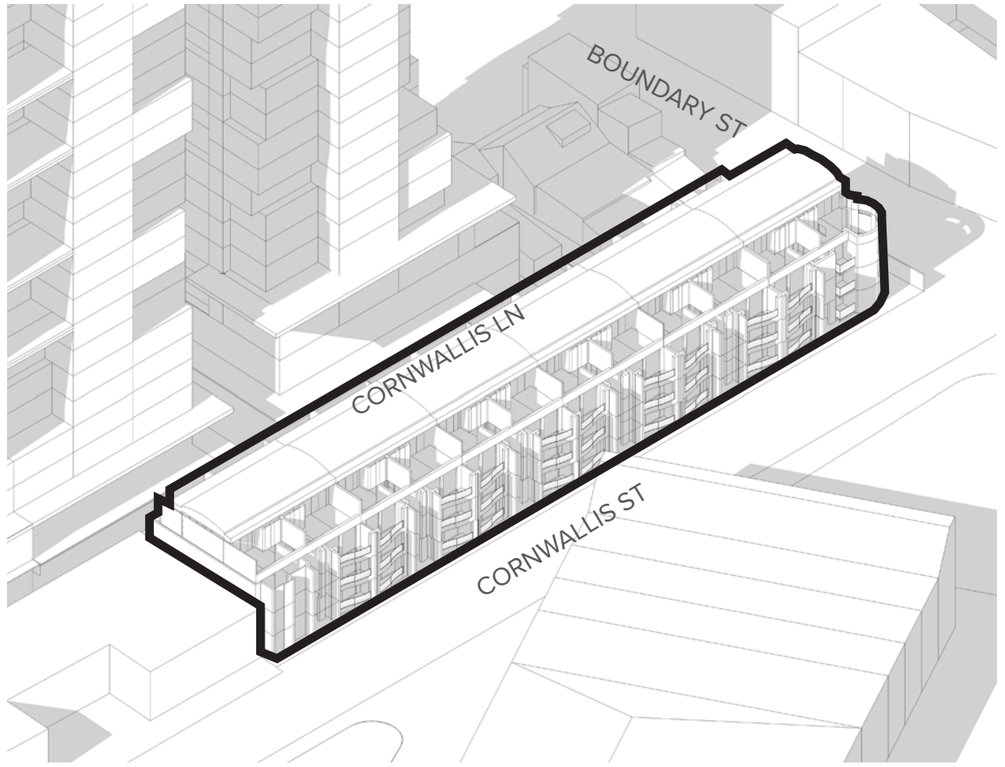
.

The proposal does not impact on the solar amenity of the usable outdoor spaces or living spaces of the existing building. The following sequence of diagrams justifies this conclusion. However, there is an impact of approximately 1 to 2 hours for the bedrooms facing the rear property boundary. It is noted these bedrooms currently use sun blinds etc. to improve sleeping conditions. It addition, it is noted the apartment age means it is a likely redevelopment site over the medium term.

The proposal is considered appropriate in terms of its solar impact on this building. There is no impact on outdoor space and living space, and only a minor impact of bedrooms that is considered acceptable.

Building Aerial View

Axonometric View



IMPACT ON RESIDENTIAL BUILDING

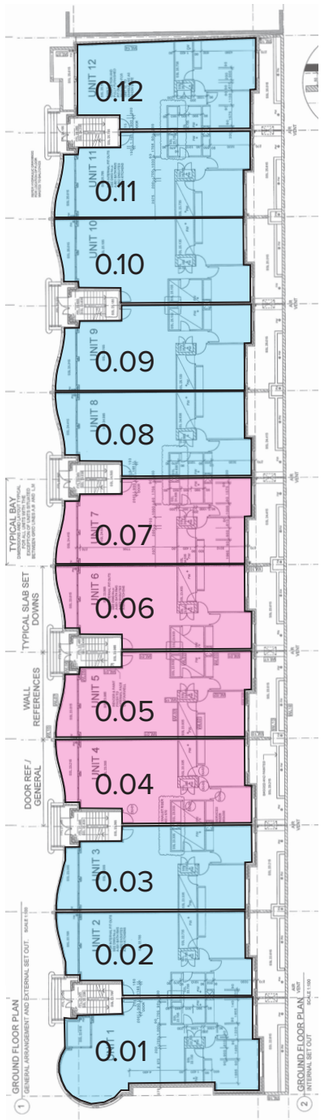
31 CORNWALLIS STREET

EXISTING 30/36 Compliant

Building Floor Plans

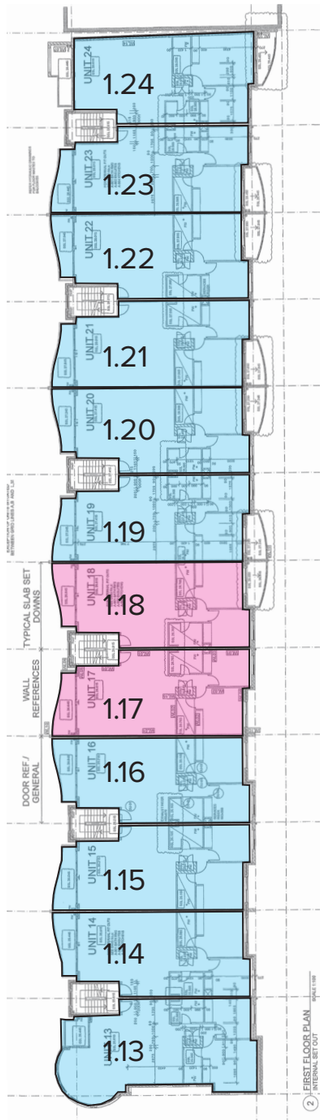
Compliant Situation

Non-compliant Situation



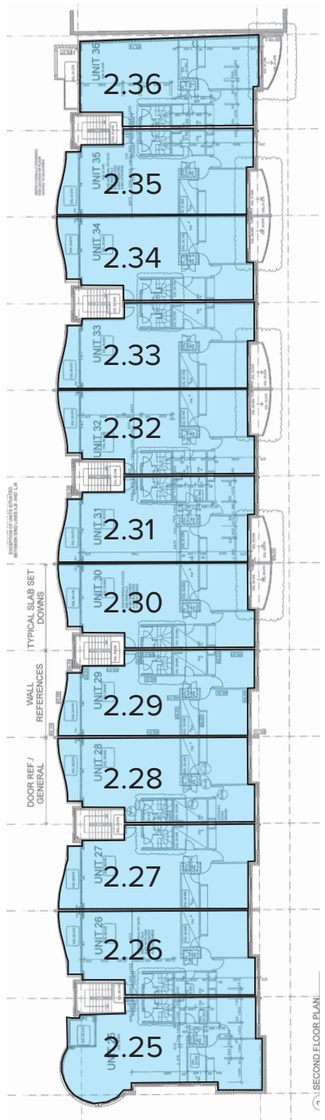
N NTS

Ground Floor



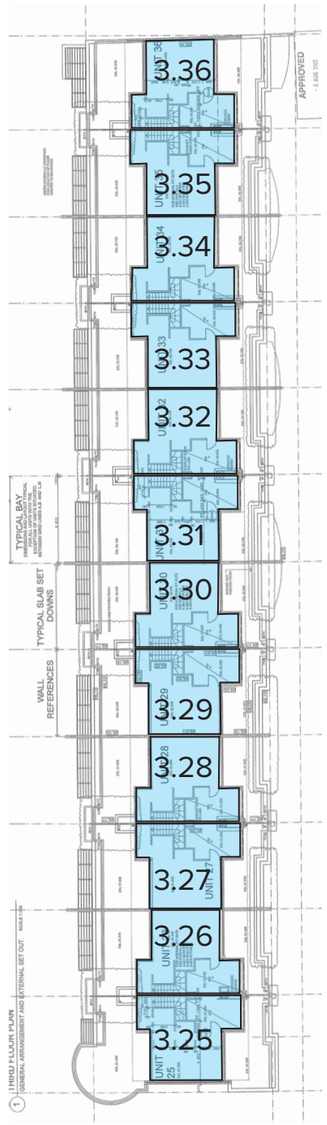
N NTS

Level 1



N NTS

Level 2



N NTS

Level 3

IMPACT ON RESIDENTIAL BUILDING

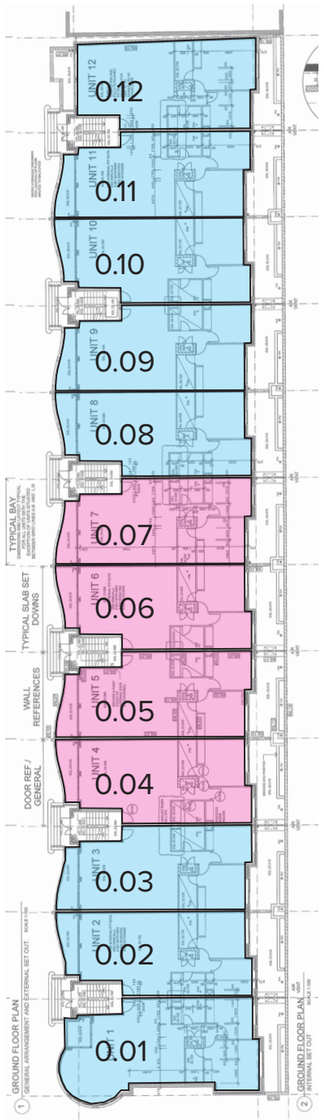
31 CORNWALLIS STREET

PROPOSED 30/36 Compliant

Building Floor Plans

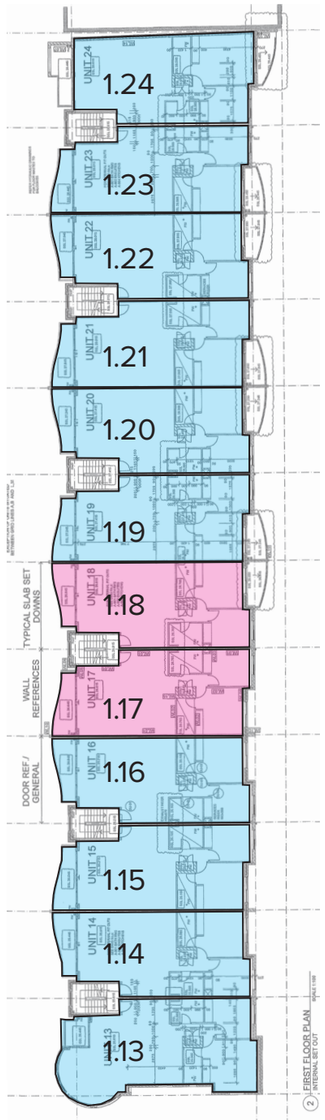
Compliant Situation

Non-compliant Situation



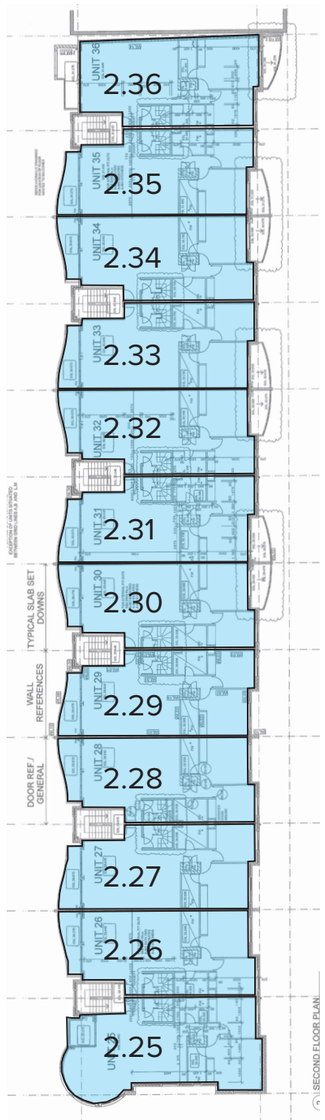
N NTS

Ground Floor



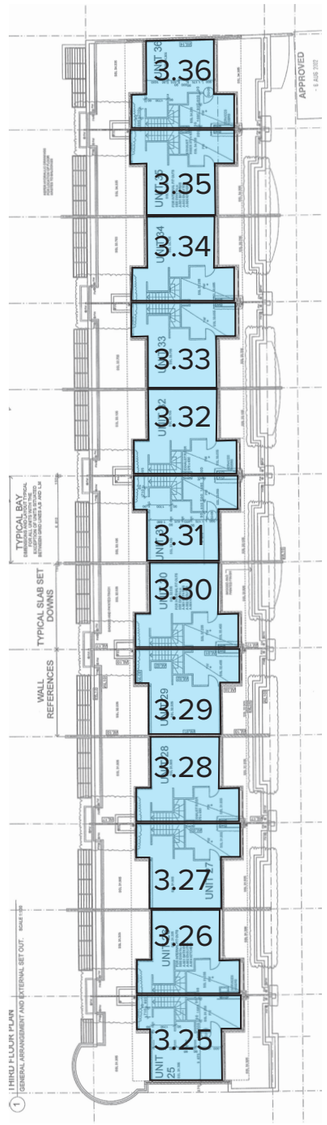
N NTS

Level 1



N NTS

Level 2



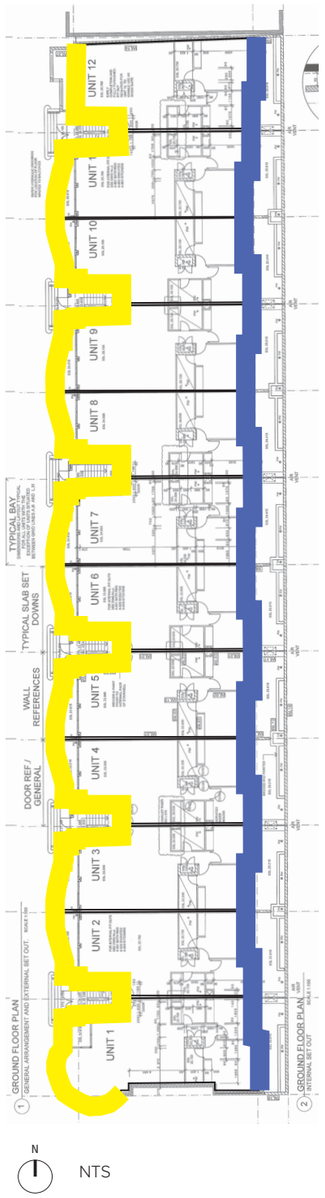
N NTS

Level 3

IMPACT ON RESIDENTIAL BUILDING

31 CORNWALLIS STREET

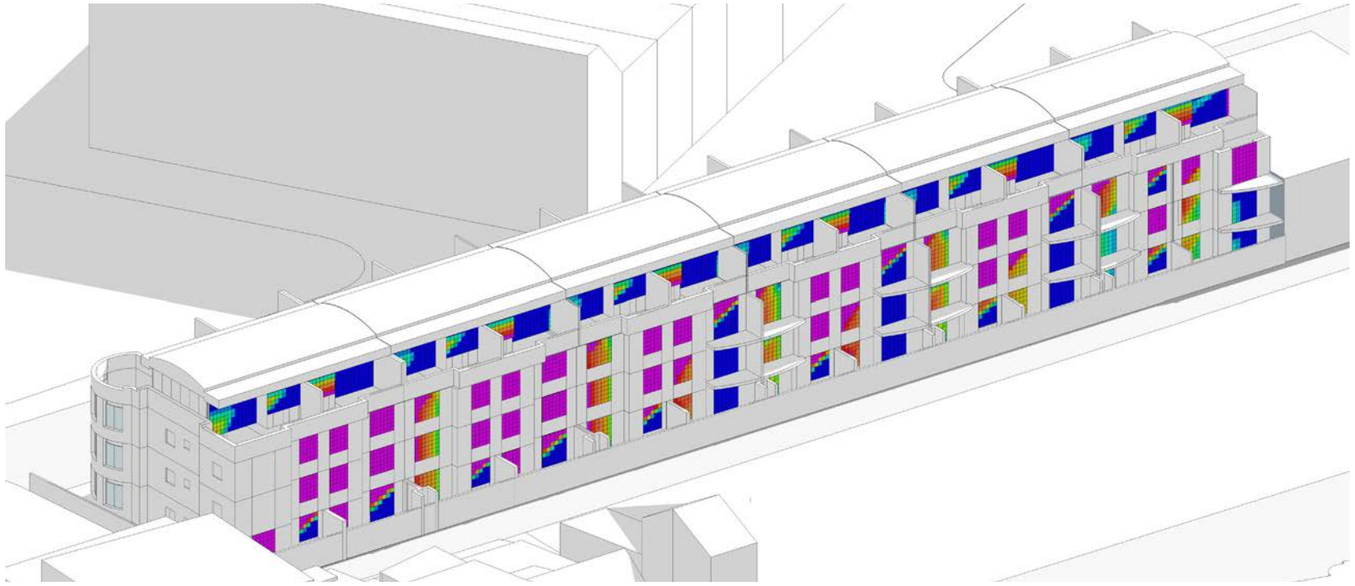
Building Floor Plans



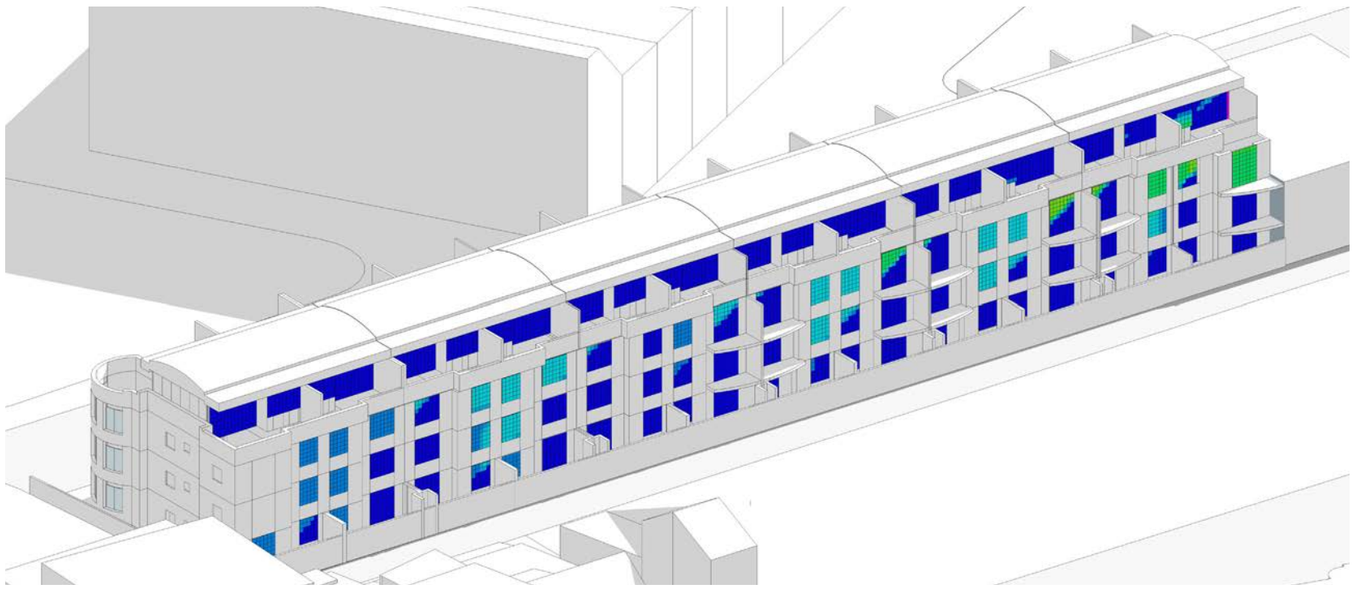
The impact of overshadowing to the eastern side of the building is slightly increased from the compliant scenario. Certain portions of the single loaded apartments are affected by the Gibbons Place scenario (receiving 15min to 2 hours of sun per day). However, as seen below, internal floor layouts show majority of non-habitable rooms, ancillary balconies and bedrooms orientate east (affected: blue), whilst key private open spaces (balconies) and habitable living spaces orientate west (unaffected: yellow).

Hours of direct sunlight received on winter solstice.

- > 2h
- 1.45h to 2.00h
- 1.30h to 1.45h
- 1.15h to 1.30h
- 1.00h to 1.15h
- 45min to 1.00h
- 30min to 45min
- 15min to 30min
- 0 to 15min



Shadow Assessment Existing



Shadow Assessment Proposed

*Solar insulation analysis on habitable room windows generated at 15 min intervals.