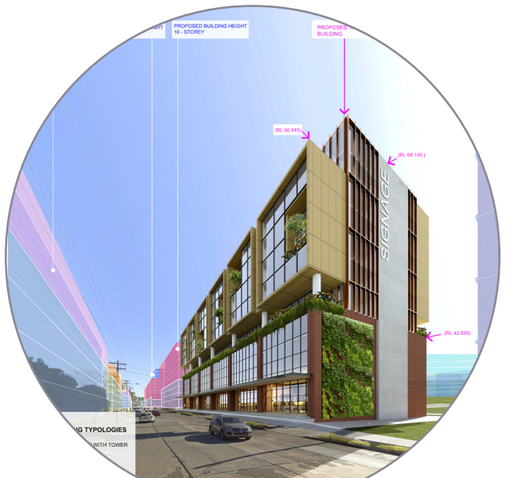

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Urban Design
Planning
Interior Design

SHADOW ANALYSIS

445-459 CANTERBURY ROAD, CAMPSIE

Dickson Rothschild | Architecture Urban Design Planning Interior Design

September 2021 | Project No. 21-087

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PROJECT NO.
21-087
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Architecture | Urban Design | Planning | Interior Design

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1 Executive Summary

This Shadow Analysis has been created for the Planning Proposal to amend Canterbury Local Environmental Plan 2012 at 445-459 Canterbury Road, Campsie. Referred within this document as " The Subject Site".

The proposal is for an increase in the height of buildings standard due to the proposed use of the site as a hospital. Hospitals are special purposes buildings which have different spatial requirements than that of residential and commercial uses.

The submission proposes a 10-storey building which is compliant with the number of storeys for the site indicated in the draft Campsie Town Centre Master Plan.

However, the assumptions built into the revised draft Campsie Town Centre Master Plan (August 2021) on maximum building heights are based on commercial and residential floor heights and plant requirements. Neither are appropriate to private hospitals, which have greater and bespoke floor heights and plant demands.

An Urban Design Review with CGI images and Shadow analysis has already been provided to Council to assess the suitability of the proposed 10-storey height and concept massing of the proposed private hospital on the current and future Canterbury Road streetscape envisaged in the Master Plan vision.

Team2 Architects prepared a conceptual 6-storey shop-top housing development design for the lots to the south of the proposed hospital, comprising 412-416 Canterbury Road and 1-5 Robertson Street.

The shadow analysis provided by Team2 established that of the 60 units, 44 would receive a minimum of 2 hours of solar access between 9AM-3PM which is a total of 73%, more than complying with ADG Objective 4A-1.

Further shadow analysis has been requested by Council to assess the implications of the additional height provided by the roof plant. The solar access of a number of specific apartments were queried by Council. This report assesses the shadow implications of the concept massing and height of the proposed hospital (with and without plant) as a whole, and on the specific apartments queried by Council.

Concept Proposal (Source: Dickson Rothschild)

2.1 SHADOW IMPACTS

This analysis provides comparisons between how the shadow would be cast by the building and the impacts of the shadow. Commentary is provided by each comparison. The shadow analysis diagrams are provided side by side within this document to provide for easy comparison.

A concept shop-top housing building with a basic indicative layout has been prepared by Team2 Architects for the site to the south of the planning proposal. Sun Eye diagrams have already been prepared to establish 70% compliance. Council have requested further analysis on the shadows which is provided within this document. Specific apartments were also requested to be outlined for their compliance.

The specific apartments requested for verification are listed below:

- Unit 3 (Level 1) (Does not Comply)
- Unit 8 (Level 1) (Complies)
- Unit 20 (Level 2) (Does not Comply)
- Unit 22 (Level 2) (Complies)
- Unit 32 (Level 3) (Complies)
- Unit 56 (Level 5) (Complies)

Provisionally, units 3 and 20 do not achieve 2 hours of sunlight because they are shadowed by the apartment building itself - and not the proposed hospital or roof plant. Nonetheless, 42 units (70%) would receive the minimum of 2 hours of solar access between 9AM - 3PM. Through more detailed design and refinement, layouts and arrangement of units could be optimised to increase the 70% figure.

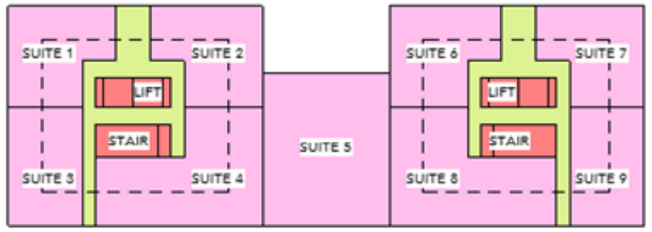
The above units are marked within the shadow analysis. Units 32 & 56 are not shown on the diagrams as due to their location within the building they will not be impacted by the concept hospital on the subject site. These apartments achieve 2 hours of sunlight in the 2PM & 3PM interval.

The proposal of a 10 storey building is consistent with the developing character of a modern town centre. The uplift in development massing compared to the existing context supports the aims and objectives of the draft Campsie Masterplan.

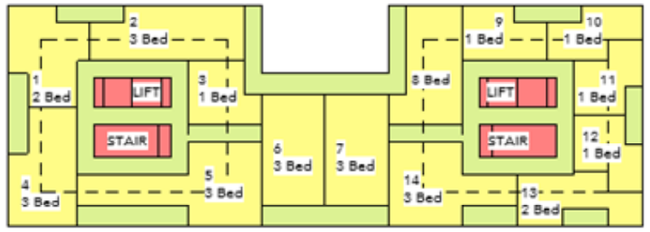
Increasing building form within the area around Canterbury road is essential and appropriate for its town centre and emerging health and medical precinct location.

It has also been questioned whether the amount of plant proposed is excessive. The applicant's engineer is has provided a response and justification to this.

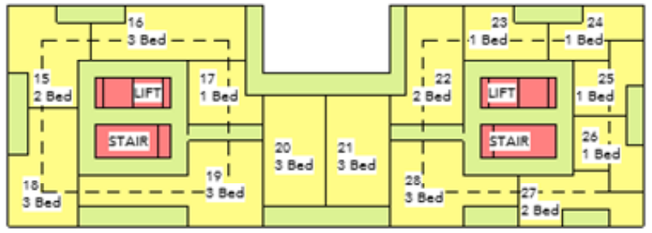
Concept Floor Plan Layout and Apartment Numbers:



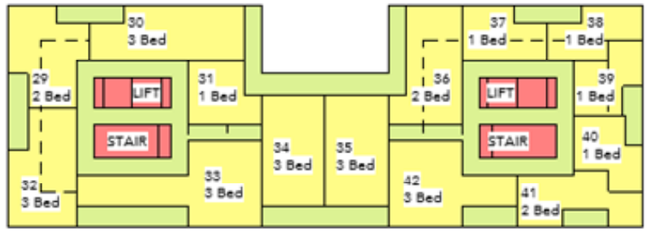
GROUND - COMMERCIAL



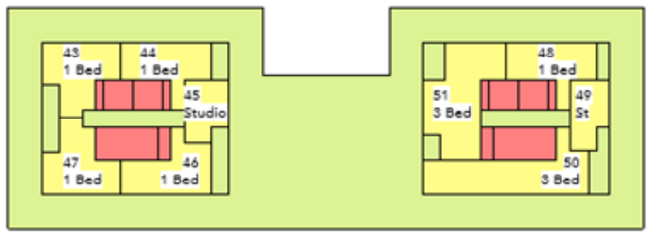
LEVEL 1 - RESIDENTIAL



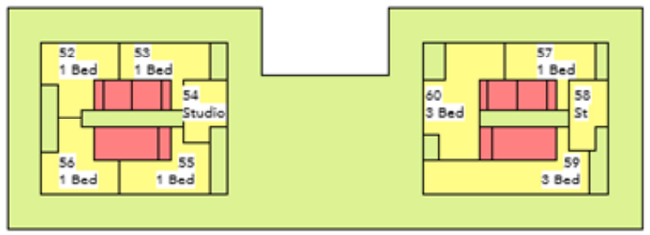
LEVEL 2 - RESIDENTIAL



LEVEL 3 - RESIDENTIAL



LEVEL 4 - RESIDENTIAL



LEVEL 5 - RESIDENTIAL

Concept Shop Top Housing on site to the south of the Subject Site (Source: Team2 Architects)

3 SHADOW ANALYSIS

3.1 SHADOW CAST - PLAN VIEW

The Shadow cast by the proposed building is shown across page with the scenario without plant on the roof also shown for comparison.

The building envisaged by the Campsie Masterplan is a 10 storey building identified to be within the developing town centre health district.

The shadow diagrams are shown for 21st June, winter solstice, which represent an absolute worst case scenario. During Spring, Summer & Autumn access to solar would be significantly improved.

The discussion will focus on the additional shadowing impacts from the plant on the roof.

21st June - 9AM

The shadow cast by the additional height provided by the plant on the roof does not increase shadowing impacts upon potential buildings to the south due to the entirety of the shadow being cast upon the roof of the proposal on the subject site.

The addition of the plant on the roof provides no increase in shadow impacts in this time interval.

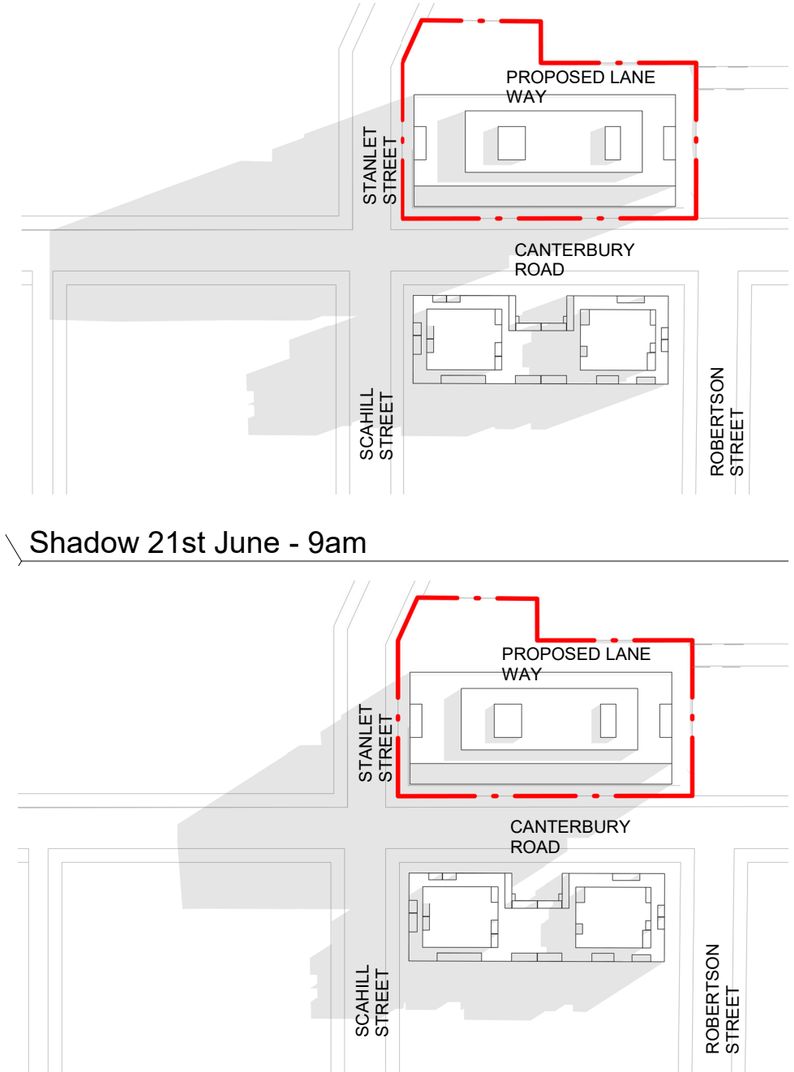
21st June - 10AM

The shadow cast by the additional height provided by the plant on the roof does not increase shadowing impacts upon potential buildings to the south due to the entirety of the shadow being cast upon the roof of the proposal on the subject site.

The shadow cast from the main 10 storey building is now partially on the facade of the concept building to the south.

The addition of the plant on the roof provides no increase in shadow impacts in this time interval.

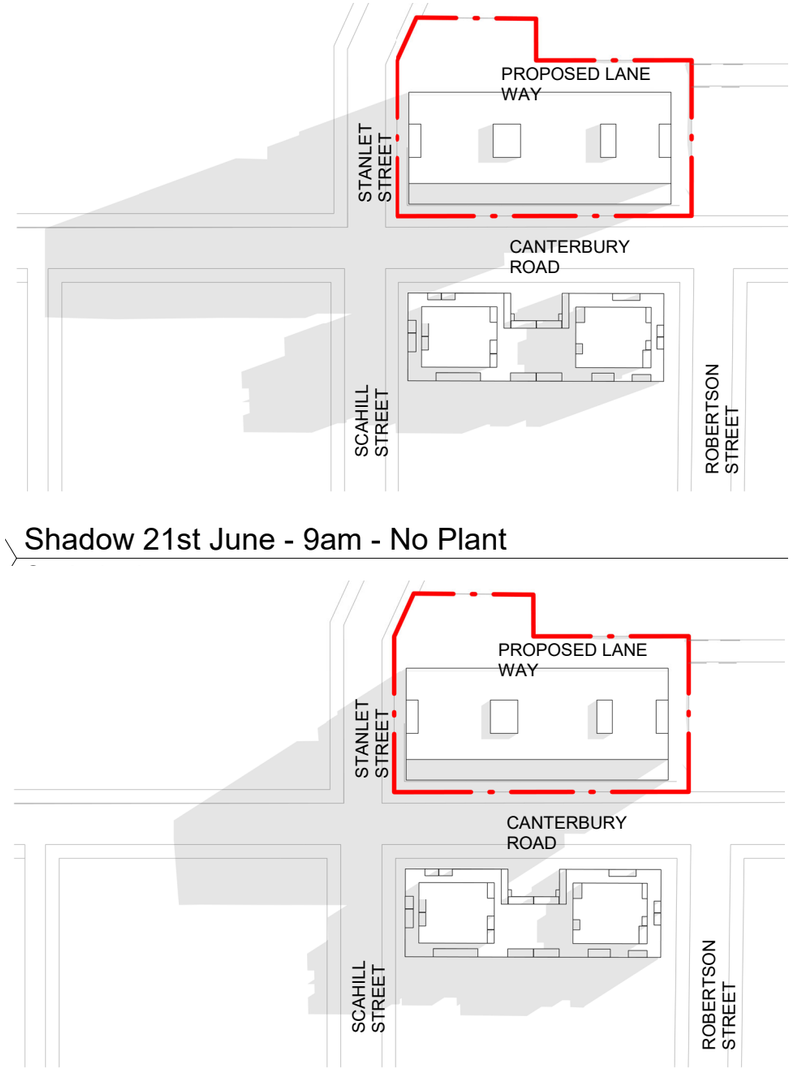
With Plant on Roof



Shadow 21st June - 9am

Shadow 21st June - 10am

Without Plant on Roof

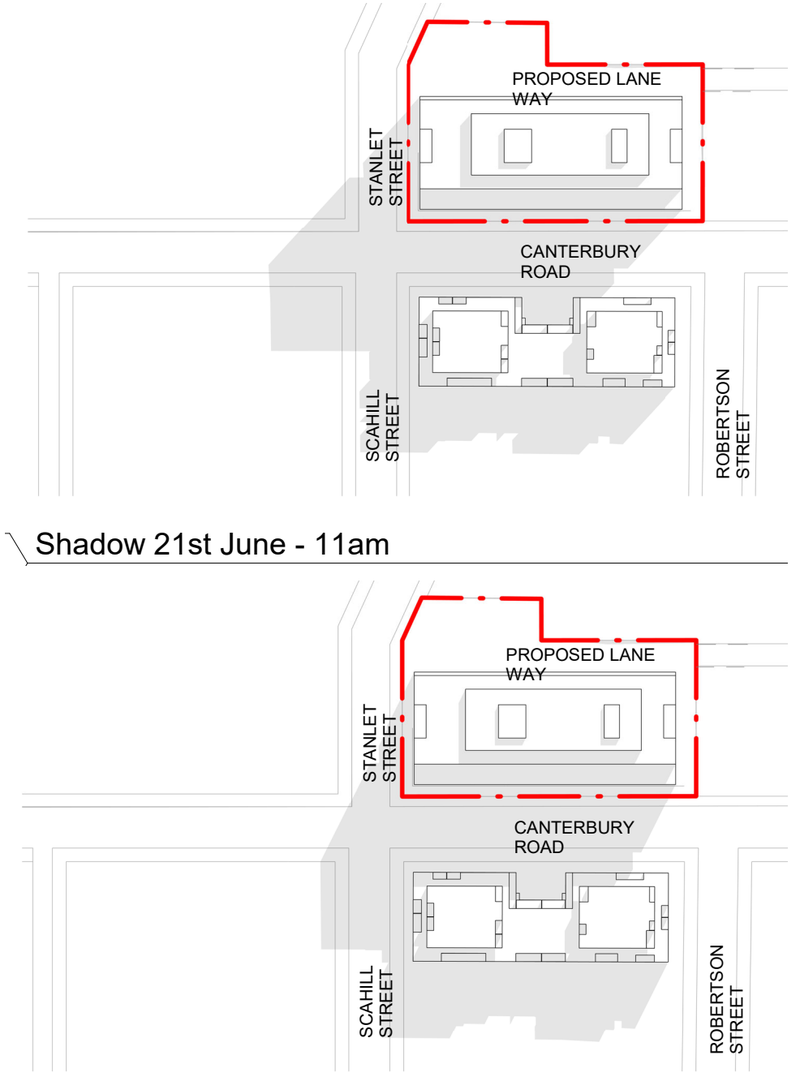


Shadow 21st June - 9am - No Plant

Shadow 21st June - 10am - No Plant

3 SHADOW ANALYSIS

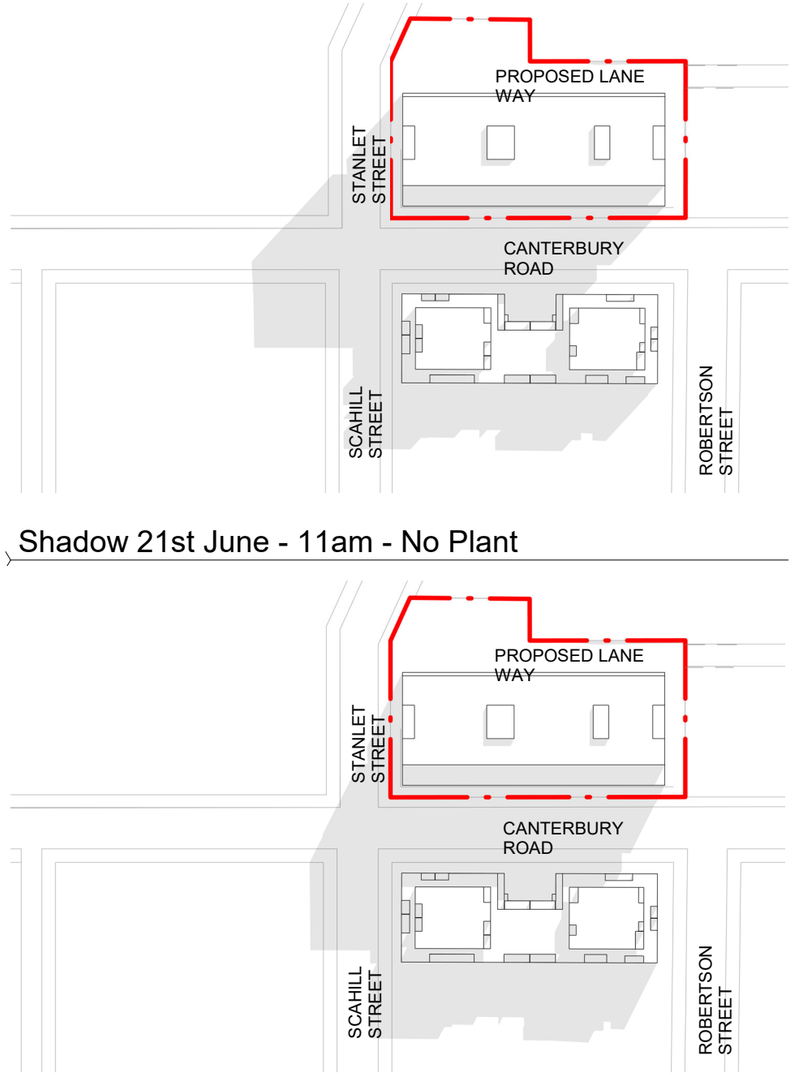
With Plant on Roof



Shadow 21st June - 11am

Shadow 21st June - 12pm

Without Plant on Roof



Shadow 21st June - 11am - No Plant

Shadow 21st June - 12pm - No Plant

21st June - 11AM

The shadow cast by the additional height provided by the plant on the roof does not increase shadowing impacts upon potential buildings to the south due to the entirety of the shadow being cast upon the roof of the proposal on the subject site.

The shadow cast by the 10 storey main building increases in size and covers more of the concept buildings facade. It should be noted that this main 10 storey building is wholly within the indicative 39.5m height advocated for the site in the draft Campsie Town Centre Master Plan.

The addition of the plant on the roof provides no increase in shadow impacts in this time interval.

21st June - 12PM

The shadow cast by the additional height provided by the plant on the roof does not increase shadowing impacts upon potential buildings to the south due to the entirety of the shadow being cast upon the roof of the proposal on the subject site. The size of the shadow has increased compared to previous hours. However the shadow that is cast by the proposed plant is still wholly on the roof of the proposed hospital on the subject site.

The shadow cast by the main 10 storey building is now large enough to be on the roof of the concept building to the south.

The addition of the plant on the roof provides no increase in shadow impacts in this time interval.

3 SHADOW ANALYSIS

21st June - 1PM

The shadow cast by the additional height provided by the plant on the roof has a minor shadowing impacts upon potential buildings to the south. That can be seen by the shadow now reaching the roof of the concept building to the south. This shadowing impact is minor in the context of the entire shadow.

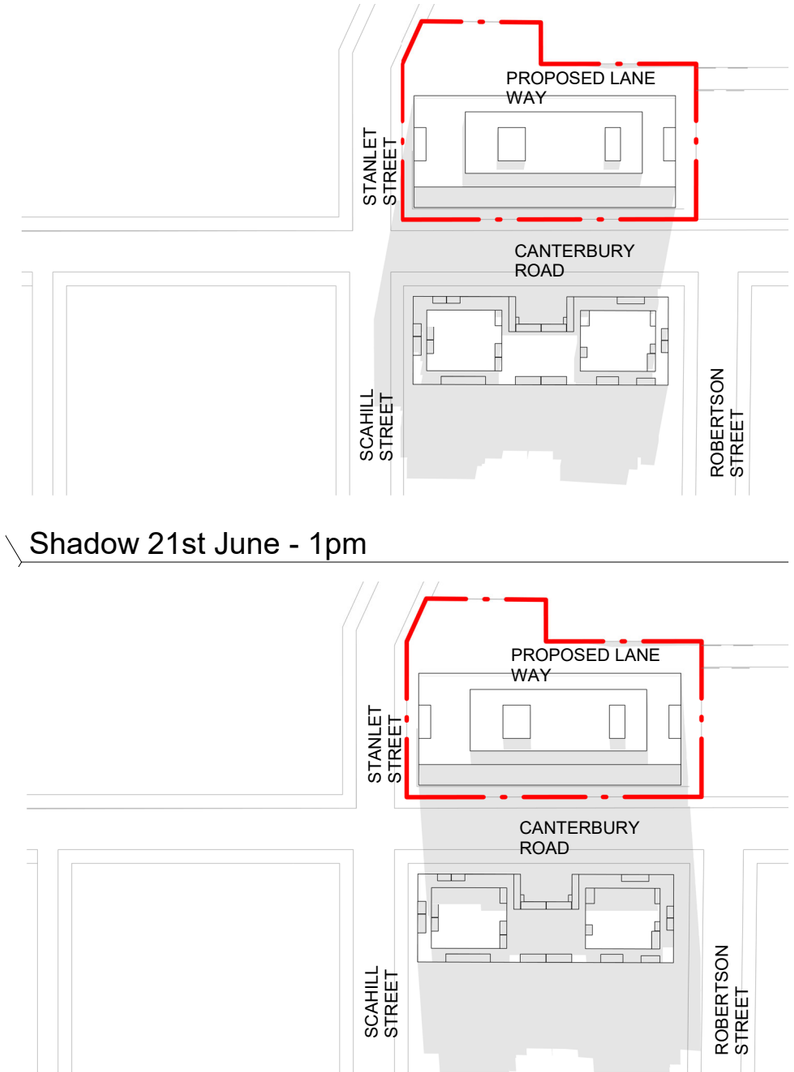
The addition of the plant on the roof provides a small increase in shadow impacts in this time interval.

21st June - 2PM

The shadow cast by the 10 storey element of the concept hospital on the subject site now reaches the roof of the concept building to the south. The implications of the plants shadow can be seen on the roof of the building, albeit minor increase in shadow. Apartments 32 & 56 would receive light during this time interval.

The addition of the plant on the roof provides no increase in shadow impacts to the facade of the concept building to the south in this time interval.

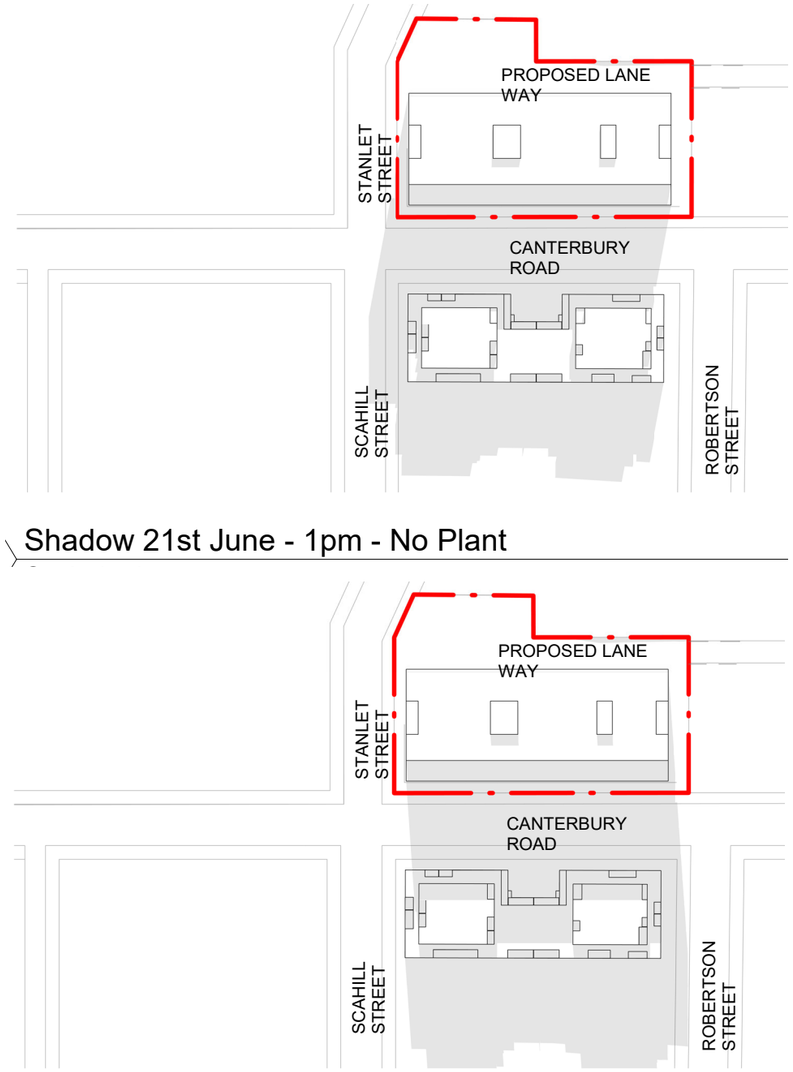
With Plant on Roof



Shadow 21st June - 1pm

Shadow 21st June - 2pm

Without Plant on Roof

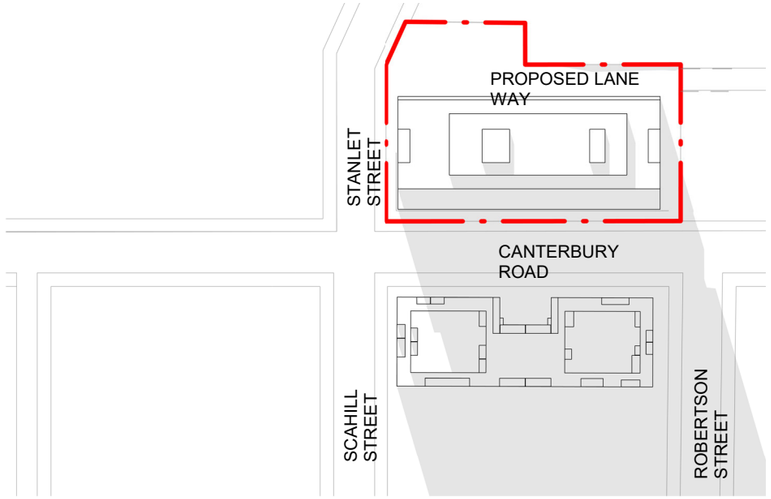


Shadow 21st June - 1pm - No Plant

Shadow 21st June - 2pm - No Plant

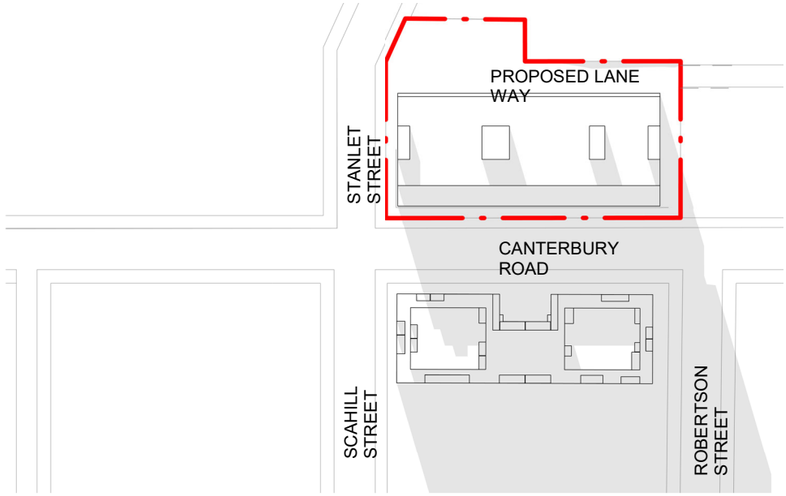
3 SHADOW ANALYSIS

With Plant on Roof



Shadow 21st June - 3pm

Without Plant on Roof



Shadow 21st June - 3pm - No Plant

21st June - 3PM

The shadow cast by the additional height provided by the plant on the roof has a minor shadowing impacts upon potential buildings to the south. This is due to the shadow from the 10 storey main building already wholly reaching the roof of the concept building to the south. There is an increased shadow projected from the plant on the roof, however this is wholly on the concept building roof to the south and no additional shadow impacts are seen. Apartments 32 & 56 would receive light during this time interval.

The additional shadow created by the plant on the roof is contextually acceptable and its impacts negligible.

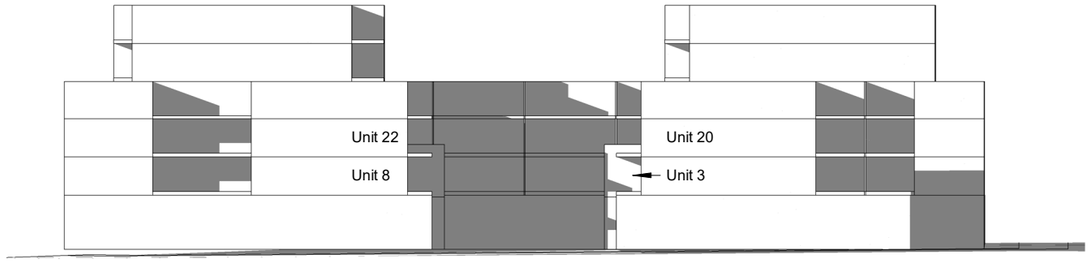
Conclusion

There are shadowing impacts from the additional height caused by the plant. However these impacts are minor and largely projected to the roof of the concept building to the south. The 10 storey main building is a modest building in terms of size for a key town centre building along a major road.

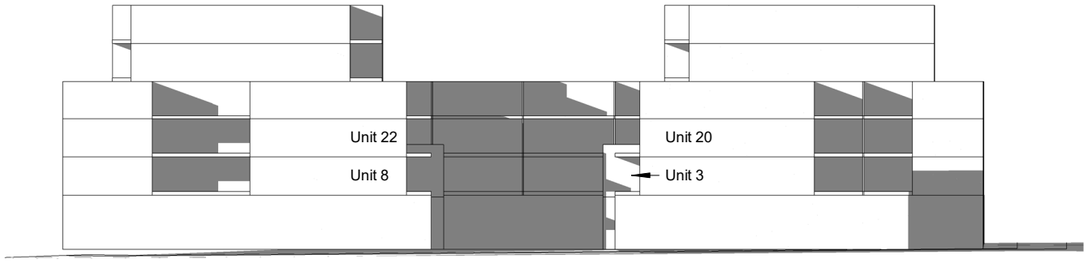
Shadowing impacts are to be expected and are an outcome caused by the growth of a centre. The additional height associated with the roof top plant on the concept hospital on the subject site does not impact the ability of the concept shop-top housing to the souths ability to achieve Objective 4A-1 of the ADG.

3 SHADOW ANALYSIS

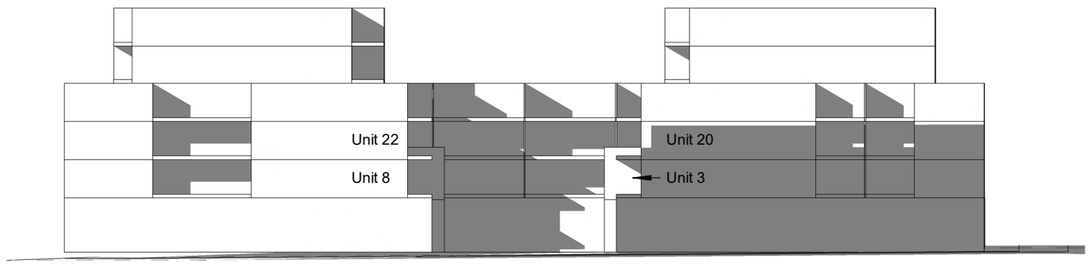
3.2 SHADOW CAST - CONCEPT ELEVATION



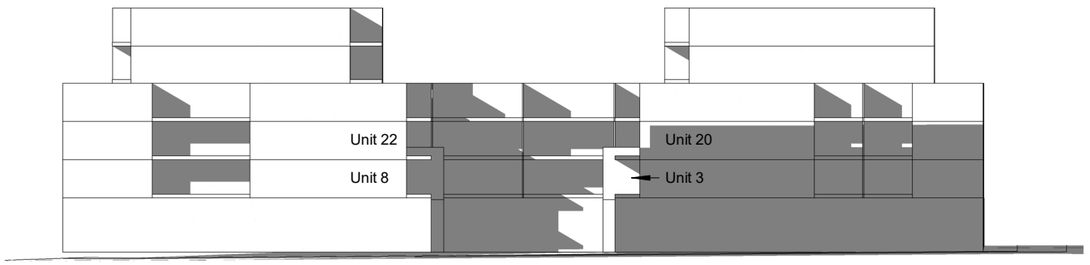
1 9am Elevation
Scale



2 9am Elevation - NO PLANT
Scale



3 10am Elevation
Scale



4 10am Elevation - NO PLANT
Scale

21st June - 9am

Impacts of the building shadow during this interval have previously been discussed.

The addition of the plant on the roof provides no increase in shadow impacts in this time interval.

During this time frame there is no shadow cast from the concept hospital onto the site to the south.

Units 22, 8 & 3 all receive excellent sunlight access during this interval.

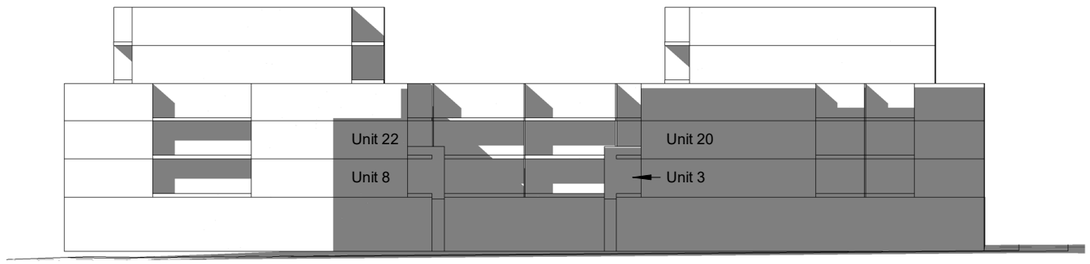
21st June - 10am

Impacts of the building shadow during this interval have previously been discussed.

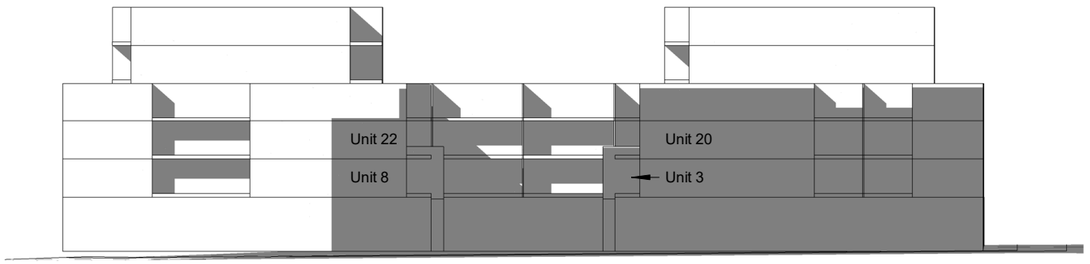
The shadow cast from the main 10 storey building is now partially on the facade of the concept building to the south.

The addition of the plant on the roof provides no increase in shadow impacts in this time interval.

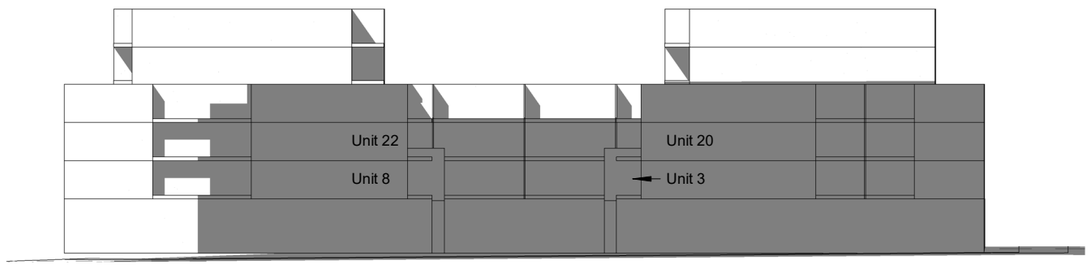
Units 22 & 8 receive full solar access during this interval and thus fulfil the requirement of 2 hours of sun light. Units 20 & 3 do not receive sunlight on the facade due to the 10 storey element of the concept hospital.



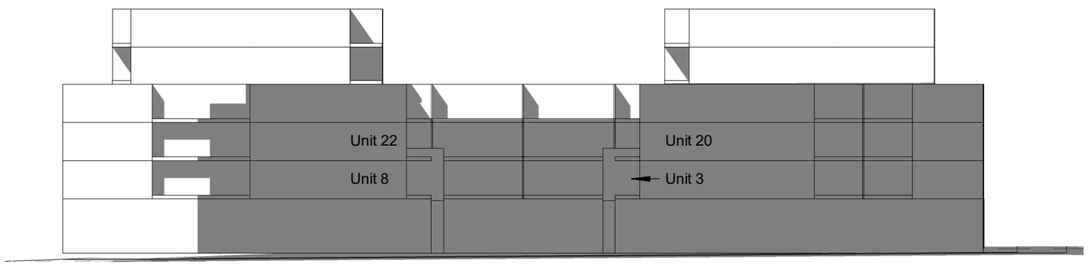
1 11am Elevation
Scale



2 11am Elevation - NO PLANT
Scale



3 12pm Elevation
Scale



4 12pm Elevation - NO PLANT
Scale

21st June - 11am

Impacts of the building shadow during this interval have previously been discussed.

The addition of the plant on the roof provides no increase in shadow impacts in this time interval.

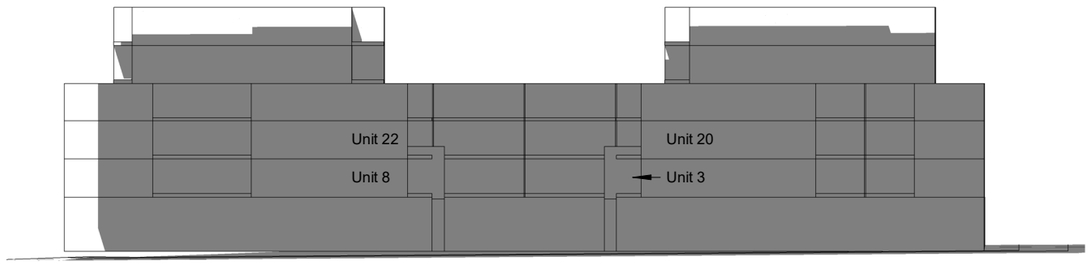
Unit 22 & 8 receive partial solar access, depending on how a developer configures the apartment they would receive some solar access. Units 20 & 3 do not receive solar access. This is however due to the 10 storey element and not the additional shadow from the plant on the roof.

21st June - 12pm

Impacts of the building shadow during this interval have previously been discussed.

In terms of shadow cast on the facade, there is no increase caused by the plant on the roof.

All subject units (22, 8, 20 & 3) are under shadow within this time interval. This is however due to the 10 storey element and not the additional shadow from the plant on the roof.



1 1pm Elevation
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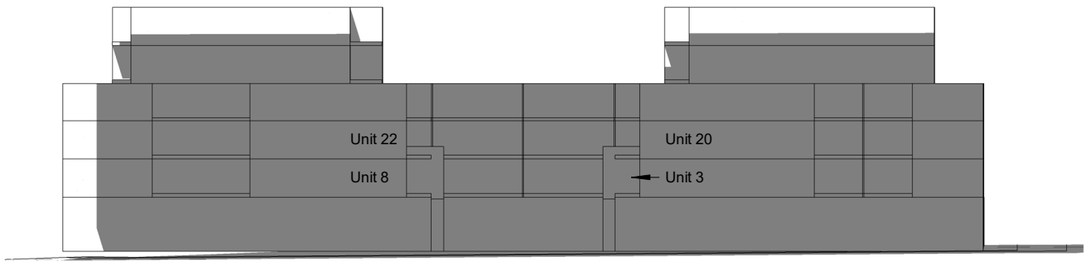

2 1pm Elevation - NO PLANT
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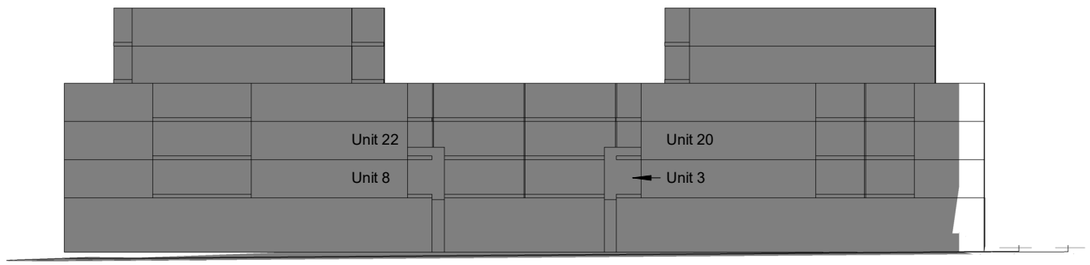
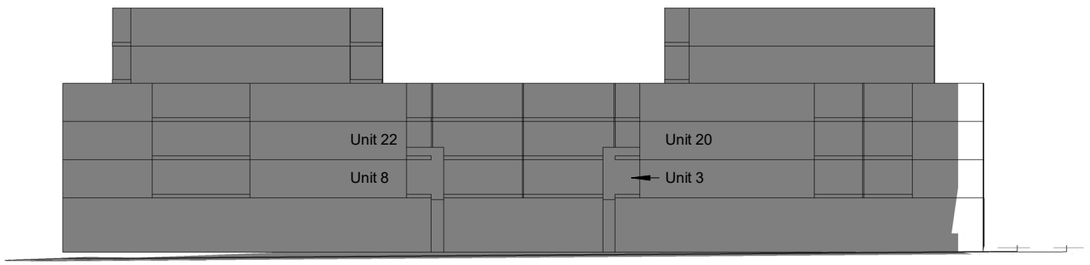


3 2pm Elevation
Scale



4 2pm Elevation - NO PLANT
Scale

21st June - 1pm

Impacts of the building shadow during this interval have previously been discussed.

The addition of the plant on the roof provides a minor increase to the shadow caused on the facade on the top storey. This impact is minor.

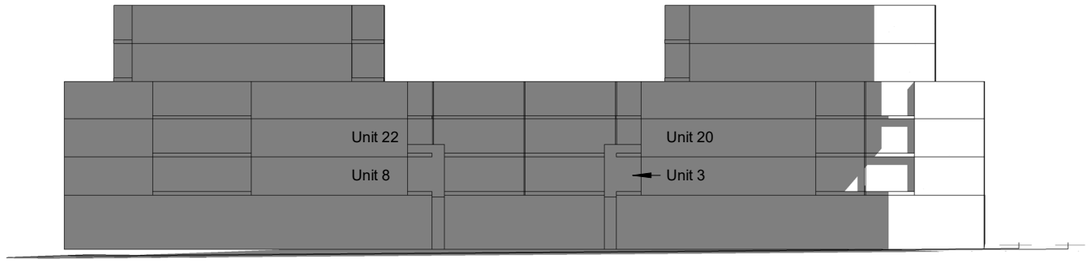
All subject units (22, 8, 20 & 3) are under shadow within this time interval. This is however due to the 10 storey element and not the additional shadow from the plant on the roof.

21st June - 2pm

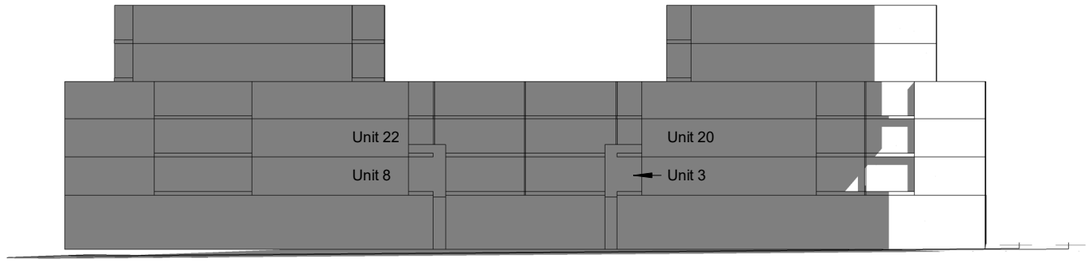
Impacts of the building shadow during this interval have previously been discussed.

The shadow cast from the main 10 storey building is cast upon the majority of the facade.

All subject units (22, 8, 20 & 3) are under shadow within this time interval. This is however due to the 10 storey element and not the additional shadow from the plant on the roof.



1 3pm Elevation
Scale



2 3pm Elevation - NO PLANT
Scale

21st June - 3pm

Impacts of the building shadow during this interval have previously been discussed.

The shadow cast from the main 10 storey building is cast upon the majority of the facade. The amount of shadow cast upon the facade is now reduced due to the suns angle within this time frame.

All subject units (22, 8, 20 & 3) are under shadow within this time interval. This is however due to the 10 storey element and not the additional shadow from the plant on the roof.

Conclusion

The shadow cast from the additional height is again shown to be minor. It does not impact upon the amount of sun light that is received by any of the units. This facade analysis also proves that units 22 & 8 achieve the 2 hours of sunlight.

4 CONCLUSION

This report has been prepared to provide an shadow analysis of the proposed development at 445-459 Canterbury Road, Campsie, and consider whether the impacts of the increase in height cause by the inclusion of rooftop plant are acceptable.

There is an increase in shadow caused by the plant on the roof. However, it should be noted that during only one interval does the increase in shadow actually impact upon the facade of the concept building to the south.

The shadowing impacts remain largely the same as if the building was to be built with a compliant building height as per the draft Campsie Masterplan.

As previously discussed hospitals are appropriately and necessary prominent buildings in their contexts, which rarely conform to height controls which are more appropriate and relevant to residential and commercial development.

The uplift in the site's building height to 10 storeys is appropriate and necessary to enable the development of a private hospital as part of the evolving Campsie town centre and provide the eastern anchor to the Eastern Lifestyle and Medical Precinct.

The height of the building aligns with the proposed 10 storey massing intended in the draft Campsie Town Centre Master Plan. The street wall height is shown at 39.5m and only plant and a single lift overrun extend above this. They are not visible at street level and this analysis has shown that the overshadowing effects of the plant and overrun on a conceptual shop-top development on land to the south are negligible.

A lower form of development would not deliver the critical mass of medical facilities and services that a private hospital offers and will undermine the much needed healthcare, social, employment and economic benefits to the area. In all respects, the development impacts such as overshadowing are far outweighed by these benefits

The study finds that the ADG 70% figure is still achieved. Of the units queried by Council Unit 8, 22, 32 & 56 comply. It should be noted that although Units 3 & 20 do not comply this is primarily due to shadows caused by the concept shop top housing and not from the concept hospital. Should the shop-top development go through detailed design then compliance of these apartments is likely to be achievable. The concept hospital provides no barrier to compliance for these units.

As has been discussed, the plant on the roof is a requirement for the hospital to be able to operate. This report establishes that the shadowing impacts associated with the plant are negligible, and wholly acceptable demonstrating compliance with ADG Objective 4A-1 relating to solar access in relation to the concept design of shop-top residential apartments located on land to the south of the proposed hospital development.

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