

Our ref: PR145916-8

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Date: 3 April 2020

Attn: Robert McKnight – Senior Project Manager
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By email: robert.mcknight@tsamgt.com

Dear Robert,

PLANNING RESPONSE TO HARRINGTON ISSUES REGARDING OVERSHADOWING AND BUILDING HEIGHT

RPS have been requested by TSA Management to prepare a detailed response to the Harrington submission to the Catherine Field Primary School SSDA dated 10 December 2019. This response letter is separate to the Response to Submissions Report that has been prepared by RPS as part of the SSDA process.

The purpose of this letter is to provide a direct response to the issues raised in the submission that relate to overshadowing impacts on the future residential dwellings to the south and the height of the proposed school.

1 Overshadowing and Solar Access

1.1 Overshadowing/Solar Access Planning Controls

The Camden Growth Centres (CGC) DCP is the applicable DCP for the subject site and the Harrington site.

Part 4 'Development in Residential Areas' of the CGC DCP contains the development controls that will apply to the future residential dwellings on the Harrington site. In relation to overshadowing and solar access, there is one control which is found at Section 4.2.1 – Table 4-3 page 82 and Table 4-4 page 83 which stipulates the following:

At least 3 hours of sunlight between 9am and 3pm at the winter solstice (21 June) to 50% of the required PPOS (Principal Private Open Space) of both the proposed development and the neighbouring properties.

The above control protects solar access to Principal Private Open Space. PPOS for dwelling houses comprises a private outdoor space which is generally adjacent to a living room. This is typically provided as a patio/alfresco and backyard. The CGC DCP does also allow for PPOS to be provided in the front yard, however only in limited circumstances. The relevant control is found at Section 4.2.7 page 97 which stipulates:

Open space at the front of the dwelling can only be defined as PPOS where this is the only means of achieving the solar access requirements of control 1 above. PPOS at the front of a dwelling must be designed to maintain appropriate privacy (for example raised level

above footpath or fencing or hedging) and be consistent with the streetscape design controls in Section 4.2.2.

There are no applicable planning controls that protect solar access to the dwellings themselves, such as to living room windows or habitable room windows. Nevertheless, in order to achieve a reasonable level of internal amenity to the future dwellings, it has been considered in this response.

1.2 Potential Layout of Future Dwellings

In order to consider the overshadowing impact on the future dwellings, the proposed layouts of those dwellings must be understood. Harrington's submission provides an indicative layout of the future dwellings which shows the dwellings facing the school with PPOS and garages at the rear. Specifically, the submissions states:

To assist with understanding the context of our comments, attached is a draft layout showing a potential subdivision pattern for the land immediately to the south of the school. Whilst we are currently proposing mostly rear loaded houses to minimize traffic conflicts with the school, the layout demonstrates that there is likely to be in excess of 20 homes directly facing the southern side of the school.

The diagram provided in the submission and the above comments are for 'rear loaded' dwellings. From the above comment and information provided to RPS, it is understood that a 'front loaded' option should also be considered. The terms 'front loaded' and 'rear loaded' are not planning terms and are not terms in the DCP. Rather, the DCP refers to front and rear 'accessed' dwellings. RPS assume that Harrington are referring to 'access' when they mention 'loading'. Based on the DCP, the 'access' of the dwelling refers to the location of the vehicular access and garage.

Following recent discussions between the proponent and Harrington, RPS have been informed that a third option should also be considered. This option is one where the PPOS is moved to the front of the lots (ie. northern end of the lots closest to the school). This PPOS may be either in the front yard of the dwellings, or if Harrington propose to reverse the orientation of the dwellings so that they face the rear lane, then they would be a 'backyard'. This is the 'worst case scenario' in terms of overshadowing impact on the lots as the PPOS is located adjacent to the front boundary, in the closest position to the school buildings. This option has been modeled into the shadow diagrams held at Appendix C.

Given this option is the 'worst case scenario', a comprehensive solar access analysis has been undertaken at the mid winter solstice. The analysis has considered the solar access against the 3 hours to 50% of the PPOS control and has also considered overshadowing of the dwellings themselves. The diagrams show the PPOS located in the 'front yard' of the dwellings, however the alternate option whereby the dwelling orientation is reversed (dwelling fronting the rear lane) has also been considered with the purple dotted line representing the rear setback line of the dwellings in that arrangement.

Based on the above, the three future dwelling layout options that have been modeled into the shadow diagrams and a comprehensive solar access analysis has been conducted are as follows:

- **Option 1 – 'Rear Accessed' Dwellings** – The vehicular access and garage would be located off the rear lane at the southern boundary of the lots. The dwellings face the school and the PPOS is located to the rear of the dwelling. This is the layout shown in the indicative layout provided in the Harrington submission and is considered the most likely development option given the planning controls. See Appendix 1.
- **Option 2 – 'Front Accessed' Dwellings** – The vehicular access and garage would be located at the front off the school street (Road No. 610) and the garage would be integrated into the front façade of the dwellings. The dwellings face the school and the PPOS is located to the rear of the dwelling. See Appendix 2.
- **Option 3 – 'Front' Private Open Space Dwellings** – PPOS is located at the northern school end of the lots, hard against the front boundary. This is the 'worst case scenario' layout in terms of overshadowing impact on the lots as the PPOS is in the closest position to the school buildings. See Appendix 3.

1.3 Overshadowing Analysis

Option 1 – ‘Rear Accessed’ Dwellings

Private Open Space

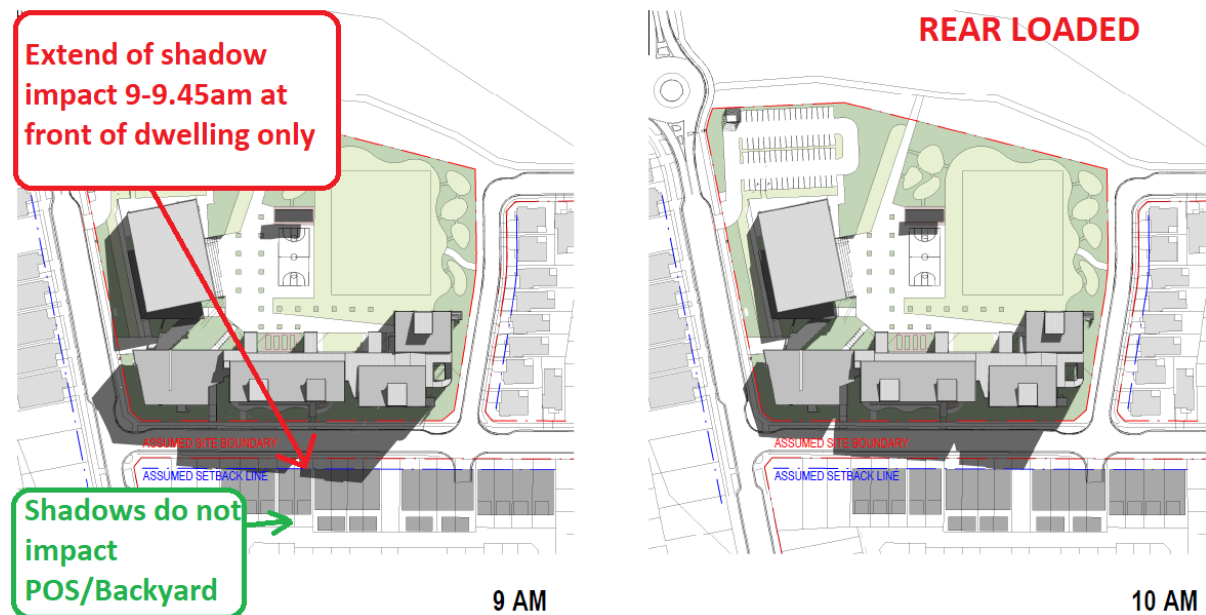
As shown on the shadow diagrams, on the worst day of the year, June 21, the shadow from the school will have no impact on the private open space of the future dwellings – for clarity, the private open space, which refers to the backyard in this instance, will be located at the rear of the dwellings. Given there will be no impact at mid winter, these dwellings will be able to receive a full 6 hours solar access between 9am and 3pm to their backyards and therefore will be able to comply with the 3 hour requirement from the DCP.

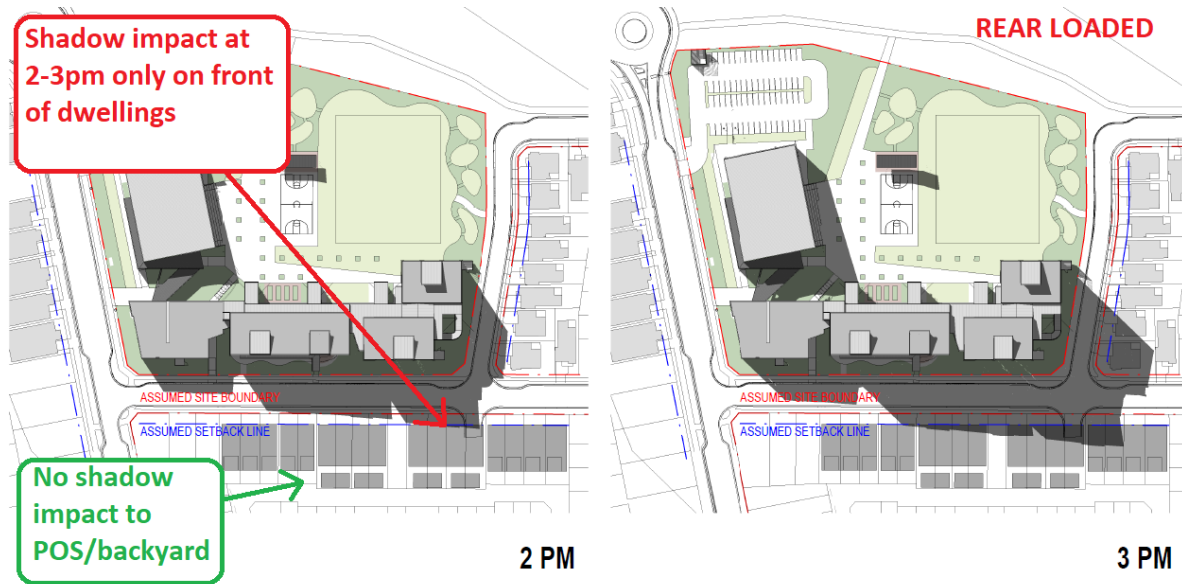
Dwelling

As shown on the shadow diagrams, the shadow from the school will have a minimal impact on the dwellings themselves. The impact is limited to the very front portion of 9 dwellings between 9am to 9.45am, and then on a mostly different set of 10 dwellings between 2pm and 3pm (see below marked up diagrams for reference). The first set of dwellings that is impacted for 45 minutes in the morning, will receive uninterrupted solar access for the remainder of the day. The set of 10 dwellings that is impacted for 1 hour in the afternoon, will receive uninterrupted solar access until 2pm. This length of impact is minor and well within typical controls for solar access to dwellings which require 2-3 hours to living rooms between 9am and 3pm at mid winter.

These future dwellings firstly, are unlikely to have their living rooms impacted at all because the shadow falls only on the front portion of the dwelling and the living rooms would most likely be at the rear facing the backyards, and secondly, the length of impact is so minor that they would receive at least 5 hours mid winter solar access nevertheless.

Accordingly, the shadowing impact to the dwellings and their PPOS is very minor and easily compliant with the applicable control.





Option 2 – ‘Front Accessed’ Dwellings

The position and orientation of the dwellings in the front and rear accessed options is the same, the only difference is the location of the driveway access and garage. In the front accessed option, the garage is at the front, integrated into the front façade. Given this, the shadowing impact for ‘front accessed’ dwellings is the same as for ‘rear accessed dwellings. The only difference in impact is that, in the front accessed option, with the garage integrated into the front facade of the dwelling, the impact on amenity would be less because instead of overshadowing a habitable room at the front, it would only be overshadowing a garage.

Option 3 – ‘Front’ Private Open Space Dwellings

Private Open Space

The ‘Principal PPOS Shadow Analysis (June 21)’ held in Appendix 3 and shown below, demonstrates that even in this worst case scenario, all of the affected lots will comply with the solar access requirement to PPOS with each achieving the required 3 hours solar access to at least 50% of the required PPOS area. It is noted that the required PPOS areas have been accurately modeled onto the shadow diagrams with either 16m² or 20m² required (dependent on lot width) and have been positioned hard up against the front boundary which is the worst case position for solar access.

Compliance is easily achieved with the vast majority of affected lots receiving full solar access of 5 to 6 hours between 9am and 3pm to at least 50% of the required PPOS area. The only time of day where more than 50% of the PPOS areas are overshadowed (denoted in red in the table) is in the early morning and late afternoon which is typical in mid winter.

Catherine Field PS - Principal Private Open Space Shadow Analysis (June 21st 9.00am to 3.00pm)

Lot Number	Time Interval (hour)																	50% solar access achieved									
	9.00am	9.15am	9.30am	9.45am	10.00am	10.15am	10.30am	10.45am	11.00am	11.15am	11.30am	11.45am	12.00pm	12.15pm	12.30pm	12.45pm	1.00pm		1.15pm	1.30pm	1.45pm	2.00pm	2.15pm	2.30pm	2.45pm	3.00pm	
Lot 68																										6 h	
Lot 69																											6 h
Lot 70																											5 h 45 min
Lot 71																											5 h 30 min
Lot 72																											5 h 30 min
Lot 73																											5 h 30 min
Lot 74																											5h
Lot 75																											4h 30min
Lot 76																											4h 30min
Lot 77																											3 h 45 min
Lot 78																											3 h 30 min
Lot 79*																											3 h 15 min
Lot 80*																											3 h 30 min
Lot 81																											3 h 30 min
Lot 82																											4 h
Lot 83																											5 h
Lot 84																											5 h 30 min
Lot 85																											5 h 45 min
Lot 86																											6 h
Lot 87																											6 h

Legend:
■ - Achieves sunlight to 50% of principal private open space area
■ - Does not achieves sunlight to 50% of principal private open space area

Dwelling

The ‘Shadowing on Dwelling Analysis (June 21)’ held in Appendix 3 and shown below, is based on the worst case scenario for solar access to the dwelling itself. The worst case scenario is where the dwelling orientation is reversed such that the dwelling faces the rear lane, and the rear living room faces the school. The shadow diagrams show a purple dotted line which represents the rear setback line (4m from the CGC DCP) of the dwellings in this reversed orientation. The table below shows red when the shadow reaches the rear building line (noting that this is only when it reaches the very edge of the rear building, not extending into the living space). Whilst there are not any applicable planning controls that protect solar access to the dwelling itself, for the purposes of providing context, a typical 3 hour solar access requirement is considered.

As shown in the table, all of the dwellings would receive at least 3 hours solar access at mid winter to a living room facing the school. The shadowing impact is limited to the early morning and late afternoon, as is typical in mid winter. The vast majority of the time, the shadow would not reach the dwellings.

Catherine Field PS - Shadowing on Dwelling Analysis (June 21st 9.00am to 3.00pm)

Lot Number	Time Interval (hour)							Min. solar access to 4m building line (hours)
	9.00am	10.00am	11.00am	12.00pm	1.00pm	2.00pm	3.00pm	
Lot 68								6
Lot 69								5
Lot 70								5
Lot 71								5
Lot 72								5
Lot 73								5
Lot 74								5
Lot 75								4
Lot 76								4
Lot 77								4
Lot 78								3
Lot 79								3
Lot 80								4
Lot 81								4
Lot 82								4
Lot 83								4
Lot 84								5
Lot 85								5
Lot 86								6
Lot 87								6

Legend:
 - Hours with solar access to whole of northern building setback (4m)
 - Hours with less than 100% solar access to whole of northern building setback (4m)

Conclusion on Overshadowing and Solar Access

The shadowing impact to the Harrington properties is minor and easily compliant with the CGC DCP control for 3 hours solar access to 50% of the required PPOS area at mid winter.

In the most likely dwelling layout options (Option 1 and 2), which have the PPOS located at the rear, there will be absolutely no overshadowing by the school of any of the PPOS areas.

Even in the worst case scenario (Option 3), where the PPOS is located directly opposite the school and the dwellings are reversed with living rooms facing the school, it has been demonstrated that all of the lots will comply with the CGC DCP control for 3 hours solar access to PPOS at mid winter. The analysis also considered solar access to the living room and demonstrated that all of the dwellings would receive at least 3 hours solar access at mid winter to a living room facing the school.

Furthermore, at the equinox (ie. mid spring/autumn), the shadow diagrams show absolutely no shadow impacting any of the lots. Accordingly, the shadow impact is limited to a brief period around the winter solstice only.

This analysis has demonstrated that the shadowing impacts of the proposed school on the future dwellings on the lots to the south are:

1. Easily compliant with the CGC DCP,
2. Minor, even when considering the worst case dwelling layout option,
3. Limited to a brief period of the year around June 21.

2 Building Height

2.1 Building Height Planning Controls

The applicable planning controls for the height of the proposed school are as follows:

- SEPP (Sydney Region Growth Centres) 2006 – Appendix 9 Camden Growth Centres Precinct Plan – Clause 4.3 – maximum Height of Buildings that applies to the subject site is 9 metres.
- SEPP (Educational Establishments and Child Care Facilities) 2017 – Part 4 Schools – Clause 42 – *Development consent may be granted for development for the purpose of a school that is State significant development even though the development would contravene a development standard imposed by this or any other environmental planning instrument under which the consent is granted.*

In accordance with Clause 42 of the Education SEPP, consent may be granted to the SSDA even though it contravenes the building height development standard. This provision provides the consent authority (ie. DPIE) the legal powers to grant consent to the proposed school even if though breaches the height of buildings development standard contained in the Growth Centres SEPP (this is a similar legal authority that Clause 4.6 Variation Requests provide consent authorities to grant consent). It is acknowledged however, that this provision does not imply that the height control and its objectives need not be considered, and as such a comprehensive justification for the proposed school height is provided below.

2.2 Building Height Variation Justification

The maximum height of the proposed school is 14.96 metres as measured to the top of the clerestory pop-up windows on Block C. This exceeds the maximum height of 9m for the site. Despite the variation, the proposal is considered to achieve the objectives of the height clause as discussed below.

(a) *to establish the maximum height of buildings,*

Comment: This objective is achieved as the height control establishes the maximum height of buildings.

(b) *to minimise visual impact and protect the amenity of adjoining development and land in terms of solar access to buildings and open space,*

Comment: The school site is a stand-alone urban block in a low density residential area. Even though it is subject to the low density residential controls being in an R2 zone, the school is a unique development and stand-alone site which would be expected to have a different character, presence and scale to the surrounding area. Accordingly, the height of the school would not appear out of character with the surroundings or have an adverse visual impact on the area.

As discussed in Part 1 of this letter, it has been demonstrated that the shadowing impacts on the existing and future dwellings surrounding the site are easily compliant with the CGC DCP control for solar access and the minor impact is limited to a brief period of the year around June 21.

(c) *to facilitate higher density development in and around commercial centres and major transport routes.*

Comment: Not applicable as the site is not located in a commercial centre or on a major transport route.

In addition to achieving the objectives of the height control, there are strong planning merits to justify the height variation as follows:


- As outlined earlier, the shadows of the proposed development will not impact the PPOS of the future dwellings south of the site and the height variation does not lead to any non-compliance with solar access controls;
- The school site is a stand-alone urban block in a low density residential area. Even though it is subject to the low density residential controls being in an R2 zone, the school is a unique development and stand-alone site which would be expected to have a different character, presence

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and scale to the surrounding dwellings. Accordingly, the height of the school would not appear out of character with the surrounding area;

- The school should act as a landmark site and development for the local area, and to achieve this, urban design principles would suggest that additional height is warranted;
- The additional height allows for a three storey school to be provided which results in a smaller building footprint, a more efficient design, more outdoor play space and more landscaped areas. This provides for an improved quality school and better streetscape outcome;
- The more compact three storey footprint is essential to achieve the Department of Education's requirements for the area of the outdoor play space and the sports field dimension requirements. Any reduction in the number of storeys would require an expansion of the building footprint, eating into the required outdoor play space and resulting in an undersized sports field. This would result in the school's capacity having to be commensurately reduced which would be to the detriment of the local area and not in the public interest.
- The maximum height of 14.96m is measured to the top of the clerestory windows on Block C. These pop-up windows are minor building elements which extend above the main roof line which has a lower height of 13.9 metres. The front roof line of Block A is compliant at 8.08m and Block B is 14.2m. Accordingly, the perceived height of the buildings is closer to 14m rather than 14.96m;
- The school buildings are comfortably setback from the boundaries by 6.2m to 9m which creates comfortable separation from the nearest dwellings. The closest dwellings to the non-compliant Block B and C will be the future dwellings opposite the southern road and the eastern road. Assuming those dwellings provide a compliant 4.5m front setback, the separation will be 27.3m to 29.9m;
- The building massing is broken down into a series of buildings to create breaks in the built form and a fine grain street pattern. The buildings will be screened by a significant landscaping strip on the southern frontage. The materials and finishes used have been chosen to complement the surroundings. These design measures will serve to visually soften and screen the school, minimising perceived bulk and scale;
- The NSW Government Architect provided support to the scale (ie. bulk and height), specifically supporting the following design aspects:
 1. *Overall masterplan, clarity of site plan and design principles;*
 2. *Civic presence and **scale** of the buildings;*
 3. *Permeability of the school grounds from the street and potential connection to future open space to the north;*
 4. *Holistic approach to topography, siting of buildings hydrology and vegetation.*

Yours sincerely,
for RPS Australia East Pty Ltd



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APPENDIX A – SHADOW DIAGRAMS WITH REAR ACCESSED DWELLINGS

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APPENDIX B – SHADOW DIAGRAMS WITH FRONT ACCESSED DWELLINGS

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APPENDIX C – SHADOW DIAGRAMS AND ANALYSIS WITH 'FRONT' PRIVATE OPEN SPACE DWELLINGS