



MEMORANDUM

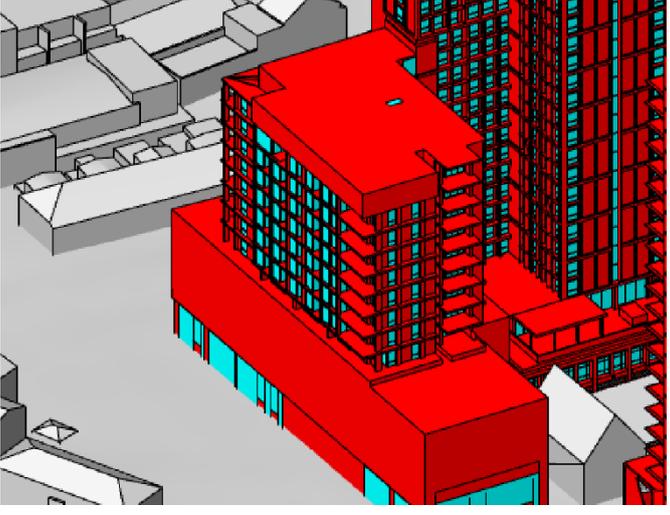
DATE:	June 4, 2021	RWDI REFERENCE #: 1904405
TO:	Annie Leung	Team Leader, Key Sites Assessments - DPIE
FROM:	Kevin Peddie	Email: kevin.peddie@rwdi.com
	Michael Pieterse	michael.pieterse@rwdi.com
RE:	Response to RtS Waterloo Metro Quarter, Building 4 – Southern Precinct	

Dear Annie,

It is understood that comments were provided by the City of Sydney as part of the Response to Submissions for Building 4 of the Waterloo Metro Quarter Southern Precinct. The following commentary discussions pertaining to Solar Access and Natural Cross Ventilation.

Solar Access

ITEM	COMMENT / RESPONSE
26	
RtS Comments	DPIE should note that the view from the sun diagrams exclude the balustrades to the balconies, which will self-shadow the apartments and reduce their compliance accordingly. Refer to the City's previous submission for an accurate calculation of solar access.
RWDI Response	The assessment of solar access for the development has considered the impact of the balustrades. Whilst the proposed balustrade material (perforated metal) will allow some light transfer, achieving ADG compliant solar access is not dependent on receiving light through the balustrade. Furthermore, the assessment of solar access is based on 1m above the floor surface. As can be noted in the view from the sun at 11am, the direct sunlight will pass over the balustrade, with no impact to the results for direct solar access.

ITEM	COMMENT / RESPONSE
	 <p data-bbox="662 891 1125 929">Artist Impression of the Balustrade</p>  <p data-bbox="662 1496 1332 1534">View from the Sun at 11am</p>



Natural Ventilation

ITEM	COMMENT / RESPONSE
33	
RtS Comments	The applicant is proposing to augment the amenity of social housing apartments with plenums, small windows and communal corridors to improve air flow. While DPIE may find that this is acceptable with regard to the constraints of the site (traffic noise, building envelope, LAHC stipulations etc) these measures should not be misconstrued as providing 'natural cross ventilation'. The definition under the ADG is as follows:
RWDI Response	Note comments in Item 34.
34	
RtS Comments	Natural ventilation which allows air to flow between positive pressure on the windward side of the building to the negative pressure on the leeward side of the building providing a greater degree of comfort and amenity for occupants. The connection between these windows must provide a clear, unobstructed air flow path. For an apartment to be considered cross ventilated, the majority of the primary living space and n-1 bedrooms (where n is the number of bedrooms) should be on a ventilation path.
RWDI Response	<p>The assessment of the apartments for natural cross ventilation has considered the prevailing wind directions for the location, with particular focus on the summer period, when the external climatic conditions are such that ventilation will be considered by the occupants. The winter months for Sydney are below the thermal comfort range by occupants and hence generally result in windows being closed.</p> <p>Consideration was made as part of the desktop assessment as to the elevated nature of the building being located atop the metro station box which would provide greater exposure to the prevailing winds. This was confirmed during the wind tunnel modelling where measurements of the pressures on the façade, window openings and plenum openings were able to be determined.</p> <p>The assessment has also considered the internal layout of the apartments to ensure that there is a flow path through the living space and the bedrooms of the apartment, Consideration has not been made for the bathroom due to the tendency for this room to be closed when guests are presence and potential for odour transfer. The occupants will have the ability to control the window openings and arrangement to control the ventilation rate and flow path, which is how any person would operate their own premises.</p> <p>The location of plenum openings and positioning within the apartments have also considered this flow path to ensure the most beneficial flow path and distribution through the apartment.</p> <p>The design is noted to achieve the following:</p>



ITEM	COMMENT / RESPONSE
	<ul style="list-style-type: none"> - 47% (33 out of 70) of the apartments on the 9 levels of Building 4 which are naturally cross ventilated via window openings. - Additional 13% (9 out of 70) of the apartments are naturally cross ventilated with the inclusion of plenums due to site constraints.
35	
RtS Comments	<p>Plenums and small windows only allow for effective airflow in one direction, where they are located on the leeward side of a building. They do not provide for effective air flow when located on the windward side (the openings are too small, usually obstructed with insect screens and in the case of plenums can get dirty and difficult to clean) and therefore fail to provide natural cross ventilation. A condition of consent should be imposed requiring cleaning and maintenance plans for the plenums.</p>
RWDI Response	<p>The airflow volume through the apartment is determined based on the pressure differential between opening locations. The direction of the flow will be dependent on which opening is located in a more positive region (with flow going from positive to negative or less positive). The direction of the flow would not govern the flow rate as the same restrictions would exist along the flow path, however there may be difference in the dispersion pattern within the apartment.</p> <p>Modelling undertaken for the apartments which utilize plenums for natural cross ventilation have been modelled based on pressure measurements from a wind tunnel study. It was demonstrated that each apartment would achieve 2 air changes per hour for more than 95% of the time throughout the year.</p> <p>The need for cleaning and maintenance is something that would be needed for every window.</p> <p>9 apartments have been considered to use the plenum design for natural cross ventilation and is based on the restrictions of the site.</p>
36	
RtS Comments	<p>Furthermore, all north facing apartments are noise affected and must have their windows and external doors closed to achieve acoustic amenity in accordance with Objective 4J-1. While it is beneficial that these apartments can open up their doors and windows to flush the air within the apartments, DPIE cannot claim that these apartments benefit from 'natural cross ventilation' in accordance with the ADG.</p>
RWDI Response	<p>The ADG does not state that noise affected apartment cannot be considered as naturally cross ventilated apartments. It does note that the design criteria for both solar and natural cross ventilation may not be possible under the Apartment Design Guide in some situations.</p>



ITEM	COMMENT / RESPONSE
	<p>Reference is made in Part 4j that SEPP65 development near rail corridors and busy roads must have regard to the NSW Governments Development near Rail Corridors and Busy Roads – Interim Guideline. Objective 4J-1 notes that the the design criteria in the ADG may not be possible in some situations due to noise and pollution. For these developments, alternatives may be considered in the areas including</p> <ul style="list-style-type: none"> - Solar and Daylight Access - Private open space and balconies - Natural cross ventilation <p>Section 4.4 of the Interim Guideline provides internal ventilation options which can be considered including:</p> <ul style="list-style-type: none"> - Natural Ventilation – windows open to provide adequate ventilation - Passive acoustic ventilation – ventilators designed and fitted to provide adequate air movements - Mechanical ventilation – operating to provide suitable air exchange rates. <p>The Design of Building 4 has considered the Interim Guideline as outlined in the ADG and provide both Natural Cross Ventilation for the occupants (when suitable and as desired) as well as passive acoustic ventilation to enable adequate air movements at all times.</p>
37	
RtS Comments	As such, only 8 out of 70 social housing units achieve natural cross ventilation.
RWDI Response	<p>Noting the commentary in response to Item 36, the design is noted to achieve the following:</p> <ul style="list-style-type: none"> - 47% (33 out of 70) of the apartments on the 9 levels of Building 4 which are naturally cross ventilated via window openings. - Additional 13% (9 out of 70) of the apartments are naturally cross ventilated with the inclusion of plenums due to site constraints.
38	
RtS Comments	The City encourages DPIE to refer to the Alternative Natural Ventilation of Apartments in Noisy Environments Performance Pathway Guideline to ensure that the plenums are designed sufficiently to provide both acoustic privacy and natural ventilation to noise affected apartments.



ITEM	COMMENT / RESPONSE
RWDI Response	The design of the plenums have been developed in coordination with the acoustic team on the project (Stantec) who will ensure that suitable acoustic lining will be provided along the length of the plenum to provide amenity and privacy for residents. The plenum's are designed to replicate the operation of a window rather than an acoustic attenuation ventilator. The apartments that are noise affected will have a separate ventilator device as per the CoS Draft Alternative Natural Ventilation of Apartments in Noisy Environments