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Date: May 4, 2017

To: Mirvac

Address: 200 George Street
Sydney NSW 2000

RE: MARRICKVILLE COMMUNITY HUB, 313-319 MARRICKVILLE ROAD, MARRICKVILLE
NATURAL CROSS VENTILATION MEMO

This technical memo is in relation to the proposed development known as Marrickville Community Hub, located 313-319 Marrickville Rd, Marrickville and the comments provided by Council in its letter of 7 March, 2017, regarding the natural cross-ventilation characteristics of the following apartments:

- Apartment 20407 (and those of the same type)
- Apartment 30301
- Apartment 10302
- Apartment 10303
- Apartment 20307
- Apartment 20308
- Apartment 20001
- Apartment 20002
- Apartment 20003

We note Windtech are suitably qualified consultants in the area of natural cross-ventilation. Effective natural cross-ventilation is a product of pressure driven flow between two openings on opposite or orthogonal aspects, with one opening more positively pressurised to the prevailing winds and drawn to other opening that is more neutrally/negatively pressurised. An assessment of the design of the abovementioned apartments was undertaken by Windtech Consultants and design feedback was provided to enhance the natural cross-ventilation through each respective apartment. The design feedback has been incorporated into the latest design of abovementioned apartments indicated in Figure 1 and summarised as follows:

- Apartment 20407 (and those of the same type): The inclusion of an opening along the western façade of the main bedroom. This would introduce an opening on an orthogonal aspect and promote the pressure driven airflow through the apartment between the more positively pressurised north-facing opening at the living area; capturing the prevailing north-easterly winds, and exhausted to the recommended opening which is more negatively or neutrally pressurised.
- Apartment 30301: The inclusion of an opening along the north-western façade of the secondary bedroom. This would introduce an opening on an orthogonal aspect and in conjunction with the proposed full-height impermeable wall along the north-western perimeter edge of the balcony, it would be effective in creating differing pressure regions at the various openings; more positively pressurised at the north-facing openings and negatively or neutrally pressurised at the recommended opening, and promote the pressure driven airflow through the apartment.
- Apartment 10302: The inclusion of an opening along the southern façade of the main bedroom. This would introduce an opening on an orthogonal aspect and promote the pressure driven airflow through the apartment between the more positively pressurised east-facing opening at the living area; capturing the prevailing north-easterly winds, and exhausted to the recommended opening which is more negatively or neutrally pressurised.
- Apartment 10303: The inclusion of an opening along the eastern façade of the primary bedroom. This would introduce an opening on an orthogonal aspect and promote the pressure driven airflow through the apartment between the more positively pressurised south-facing opening at the living area; capturing the prevailing southerly winds, and exhausted to the recommended opening which is more negatively or neutrally pressurised.
- Apartment 20307: The design, location and orientation of the apartment is similar to Apartment 20407, hence the abovementioned recommendations for Apartment 20407 is applicable.
- Apartment 20308: The inclusion of an opening along the north-western façade of the secondary bedroom. This would introduce an opening on an orthogonal aspect and in conjunction with the proposed full-height impermeable wall along the north-western perimeter edge of the balcony, it would be effective in creating differing pressure regions at the various openings; more positively pressurised at the north-facing opening of the living area and negatively or neutrally pressurised at the recommended opening, and promote the pressure driven airflow through the apartment.
- Apartment 20001: The inclusion of an opening along the western façade of the secondary bedroom on the Upper Level 01. This would introduce an opening on an orthogonal aspect promote the pressure driven airflow through the apartment between the more positively pressurised north-facing opening at the living area on the ground

level; capturing the prevailing north-easterly winds, and exhausted to the recommended opening which is more negatively or neutrally pressurised.

- Apartment 20002: We are in agreement that the design of the apartment will not display effective natural cross-ventilation through the apartment.
- Apartment 20003: We are in agreement that the design of the apartment will not display effective natural cross-ventilation through the apartment.

Note recommended openings have a minimum effective openable area of 0.4m^2. Based on our extensive experience and research into natural cross ventilation characteristics of residential apartment buildings utilising wind tunnel testing as well as full-scale verification testing (Peddie and Rofail, 2011) this is the minimum effective openable area required to generate pressure driven airflow between openings. Furthermore this has been established as an acceptable minimum openable area as part of the Land and Environment Court Case (Case number 10266 of 2015) between the City of Sydney Council and the proposed development at 216-228A Elizabeth Street, Surry Hills.

Of the above mentioned apartments only 20002 and 20003 do not achieve natural cross ventilation. In place of these, we have worked with Mirvac Design and TZG to introduce a vent with a cross sectional area of 0.4m2 to each stack of 6 apartments in the centre of Building A, Apartment 20302 and above to Level 8. This vent connects through to the break in the building from the west, allowing cross flow with glazing in the apartment facing east.

Yours sincerely,

Kevin Peddie
MsEM, BE Aero (Hons)

Associate Director

Windtech Consultants Pty Ltd

Figure 1 – Floorplan Layout Incorporating Recommended Treatments

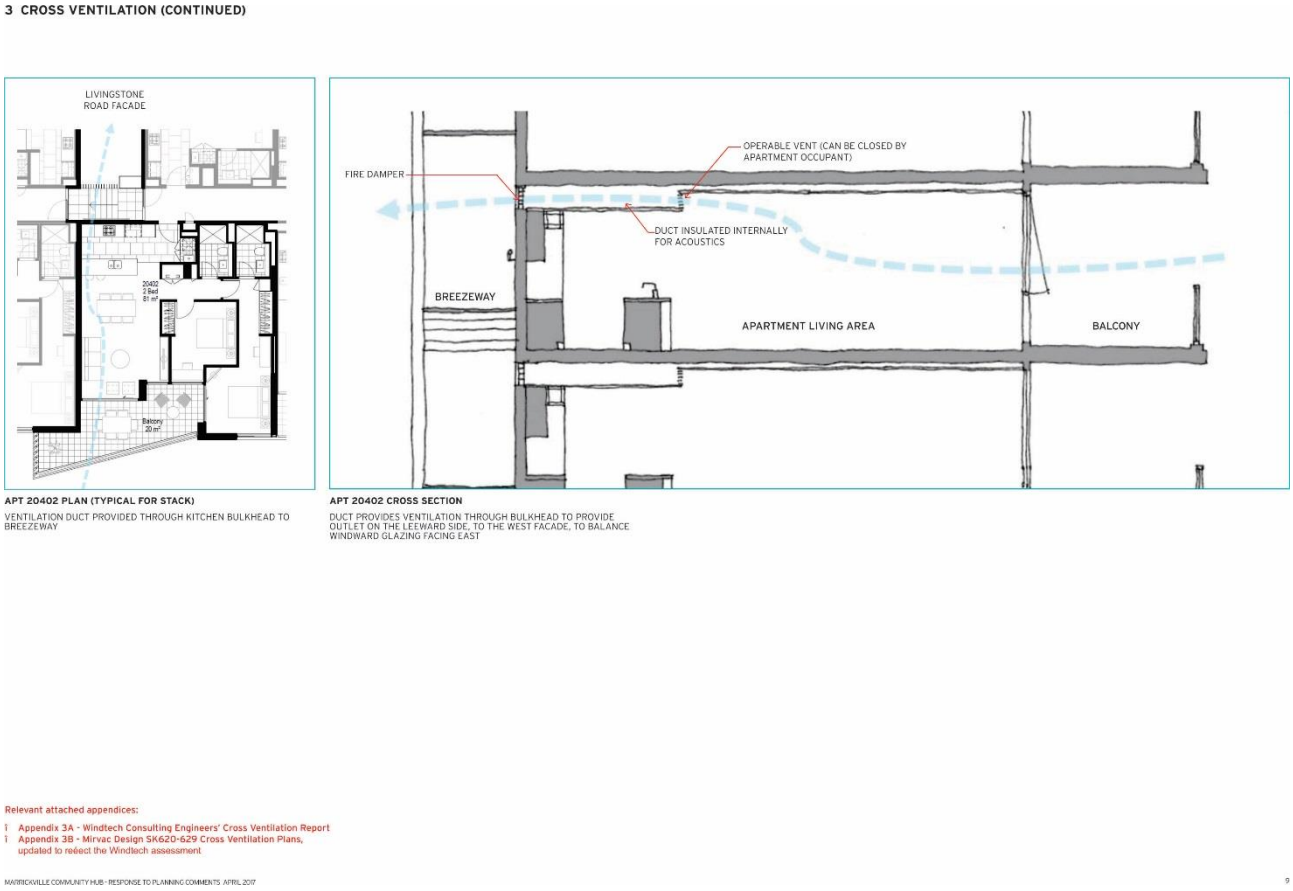

Figure 2 – Floorplan Layout & Section View of Ventilation Duct Design

DOCUMENT CONTROL

Date	Revision History	Issued Revision	Prepared By (initials)	Instructed By (initials)	Reviewed & Authorised by (initials)
April 5, 2017	Initial.	0	TH/DR	KP	TH
April 5, 2017	Comments	1	KP	KP	KP
May 1, 2017	Updated Figures	2	DR	KP	KP
May 4, 2017	Comments	3	DR	KP	KP