Stantec

Memo

Project:	Waterloo Over Station Development (Southern Precinct)	**Project No:**	46198
To:	Patrick Garland	**Date:**	15 February 2020
From:	Brandon Notaras		

RE: Response to Submissions – City of Sydney – Item 34

The purpose of this technical memorandum is to respond to the City of Sydney comments on the SSD DA submission for SSD-10437 (Southern Precinct). Specifically, this memo responds to item 34 of the City of Sydney submission (the Flux Consultants peer review).

The responses have been tabulated on the next page for each corresponding comment within the peer review. In addition to these responses, additional information has been provided such as:

- Further detailed convergence graph showing additional iterations
- Velocity contour and vector graphs requested
- Further detailed acoustic ventilator sketch showing exact dimensions of components to be provided

The changes made to the acoustic ventilator design have resulted in a reduced pressure drop across the ventilator, from 3.331 Pa to 3.129 Pa. because of the increased effective open area for the internal grille, shown in the further detailed acoustic ventilator design.

Yours sincerely

Stantec Australia Pty Ltd

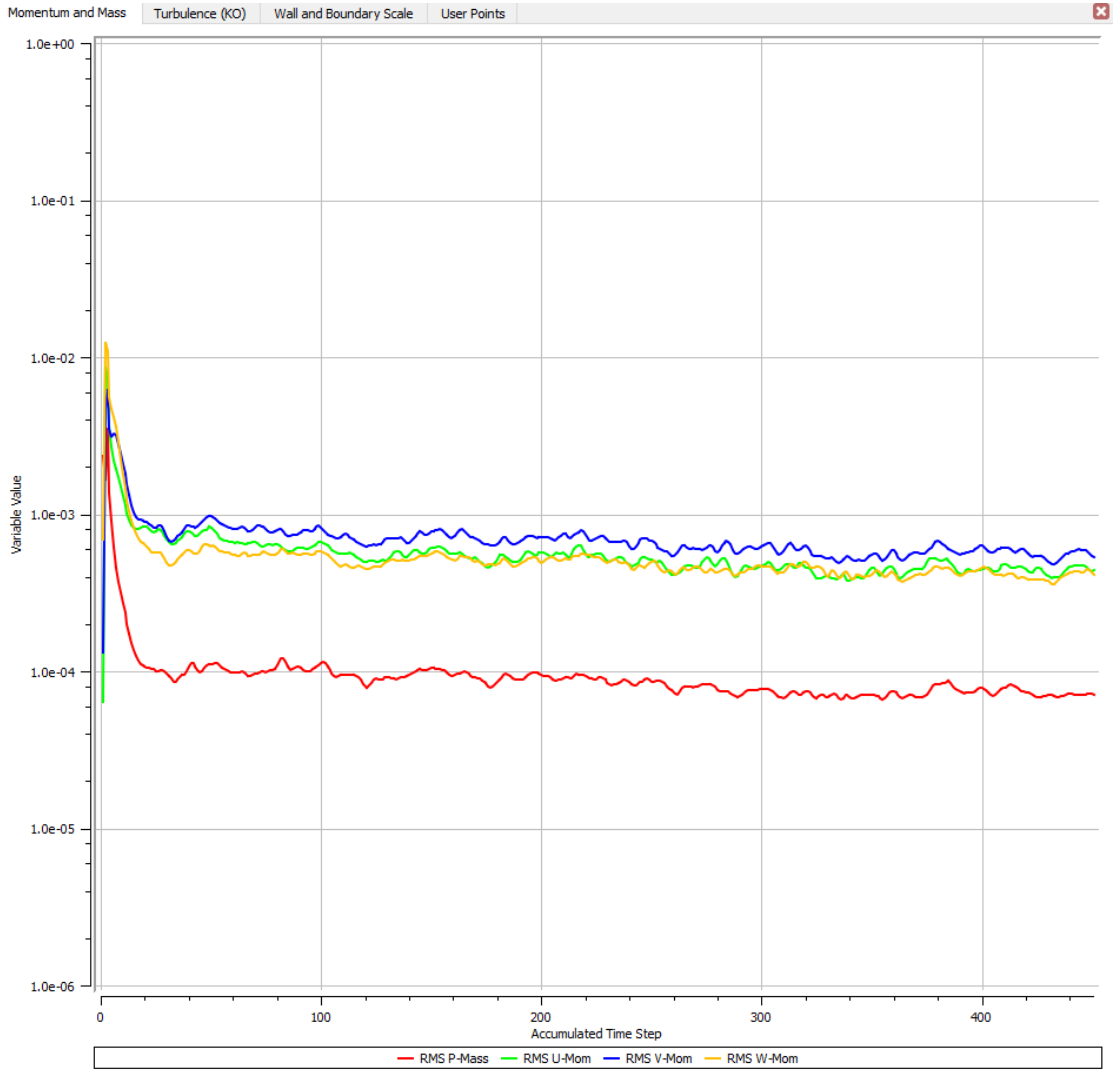
Brandon Notaras
Associate – Acoustics, Noise & Vibration

Comment No.	Description	WL Developer Response
1	The report does not verify that non-acoustically treated unobstructed windows opening of sufficient size are provided to meet the balance of the 5% of habitable range served guided by ADG. This is a necessary aspect of an alternative ventilation system and must be demonstrated to comply with the performance pathway.	The WL Developer confirms that non-acoustically treated unobstructed windows opening of sufficient size are provided to meet the balance of the 5% of habitable range served by the ADG.
2	The method of calculating the performance of the flyscreen is not described.	The flyscreen has been modelled as a function of its geometry. It should be noted the diameter of the yarn used in the flyscreen is 0.25mm, and the strands cannot be effectively modelled this thin (feasibly within CFD). Therefore, the strands are modelled with an increased diameter of 10mm diameter, and a spacing between strands to provide an equivalent free area of approximately 60% (this is 8% lower than the quoted geometric free area value quoted I the product specification). In addition to this, it should be noted that either geometry will not produce a significant difference in turbulence because the flow is generally laminar through this element and there are no significant changes in flow direction at this location. This is unlike the louvres, given they impinge the flow.
3	A convergence graph is shown for the key variable residual errors. The graph is presented at 300 iterations. It is assumed this is also the timestamp at which the results are taken. The graph shows some initial instability in the calculations, and we recommend additional iterations to confirm that the solution has converged.	Figure 1 within this memo presents the convergence graph with additional iterations requested. Convergence graph provided within the Noise & Vibration Impact Assessment consisted of an extra instability peak because of additional runs that were used to initiate the final run. For the convergence graph provided in Figure 1, we haven't needed to run the model in this manner given it is an update of the original model. The additional iterations confirmed the solution had converged, given the outcome did not change.
4	Results of the CFD calculations are shown for pressures but not airflows or velocity vectors. Airflow plots would add considerable weight and provide confidence to the results.	Velocity contours and velocity vector graphs are presented in Figure 2 and Figure 3 in this document, respectively. The graphs demonstrate the outcome of the modelling has not changed, and provide confidence to the results.

5	The various functional components are dimensioned in the drawing, and a percentage open nominated for each. The diagram is not clear about whether the percentage open quoted is applied as a geometric opening or equivalent area for ventilation The latter is required and should be correctly specified.	Given the components are modelled as a function of their geometry, the specification of an equivalent area for ventilation is not relevant if we are selecting the components listed in the documentation. To provide flexibility in design for alternative component selection, the WL Developer will specify an equivalent area for ventilation for comparison amongst products.
6	The specification for alternative natural ventilation devices is inadequate as there are no details of individual components provided beyond the single annotated diagram. The specification of alternative natural ventilation requirements does not address how a resident will control or close the plenum or internal access for cleaning and routine maintenance. These are important design aspects to ensure they meet the requirements of the guidelines. The applicant should confirm these arrangements before any approval as they could materially impact the proposed design and minimum rates of ventilation provided.	The equivalent free area % for ventilation has been provided for each individual component in the updated acoustic ventilator sketch, which future selected components will be required to achieve. Specification of exact or particular product materials will occur during the next stage of design (design development/detailed design) based on product availability at the time of tender and various other elements. Maintenance and cleaning will be conducted through the access panel shown on the updated acoustic ventilator sketch, in addition to the internal grille being removeable.

Further Detailed Convergence Graph

Figure 1: Updated convergence graph



Velocity Contour and Vector Graphs

Figure 2: Velocity contour map – acoustic ventilator (in plan)

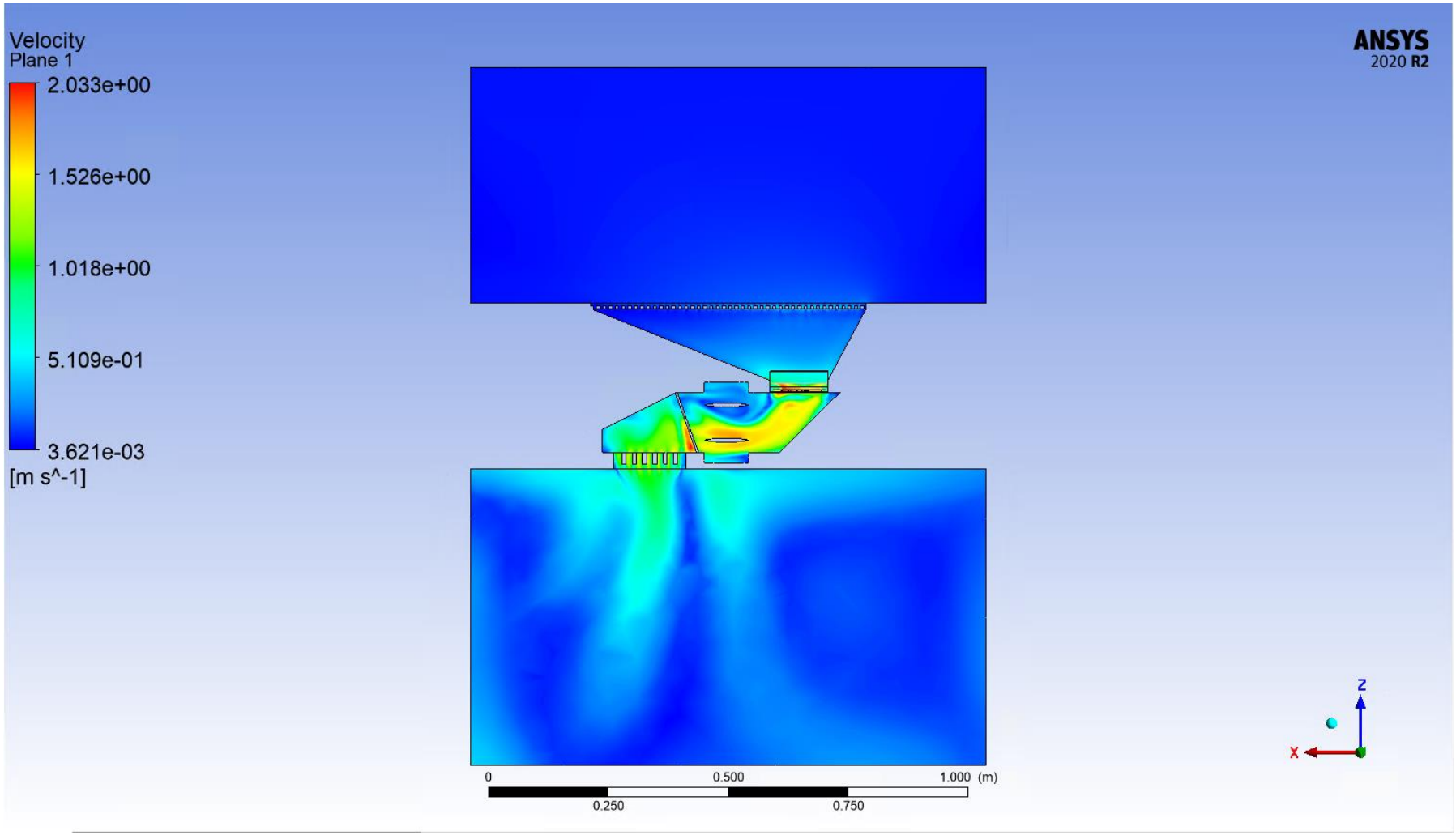
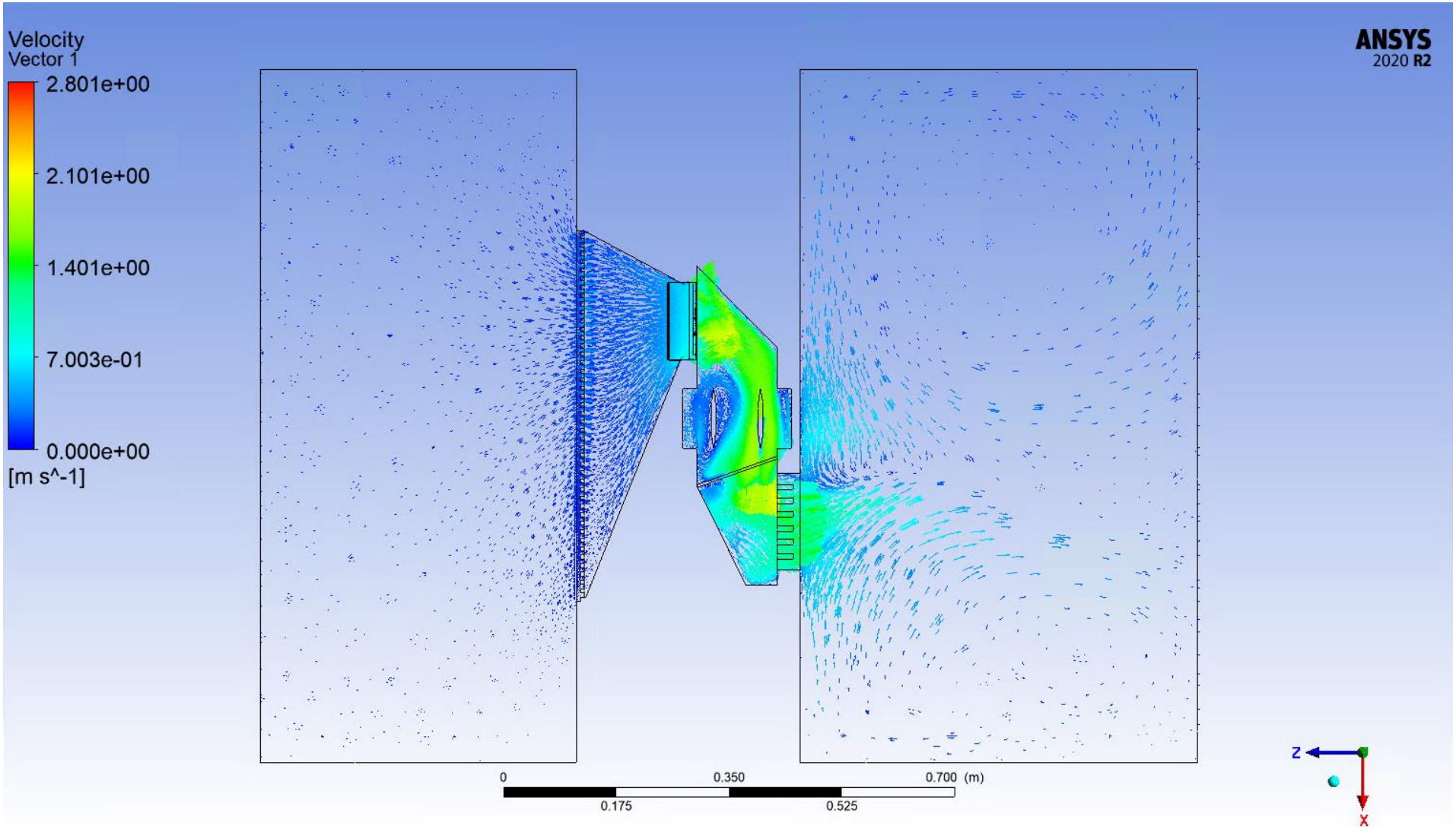
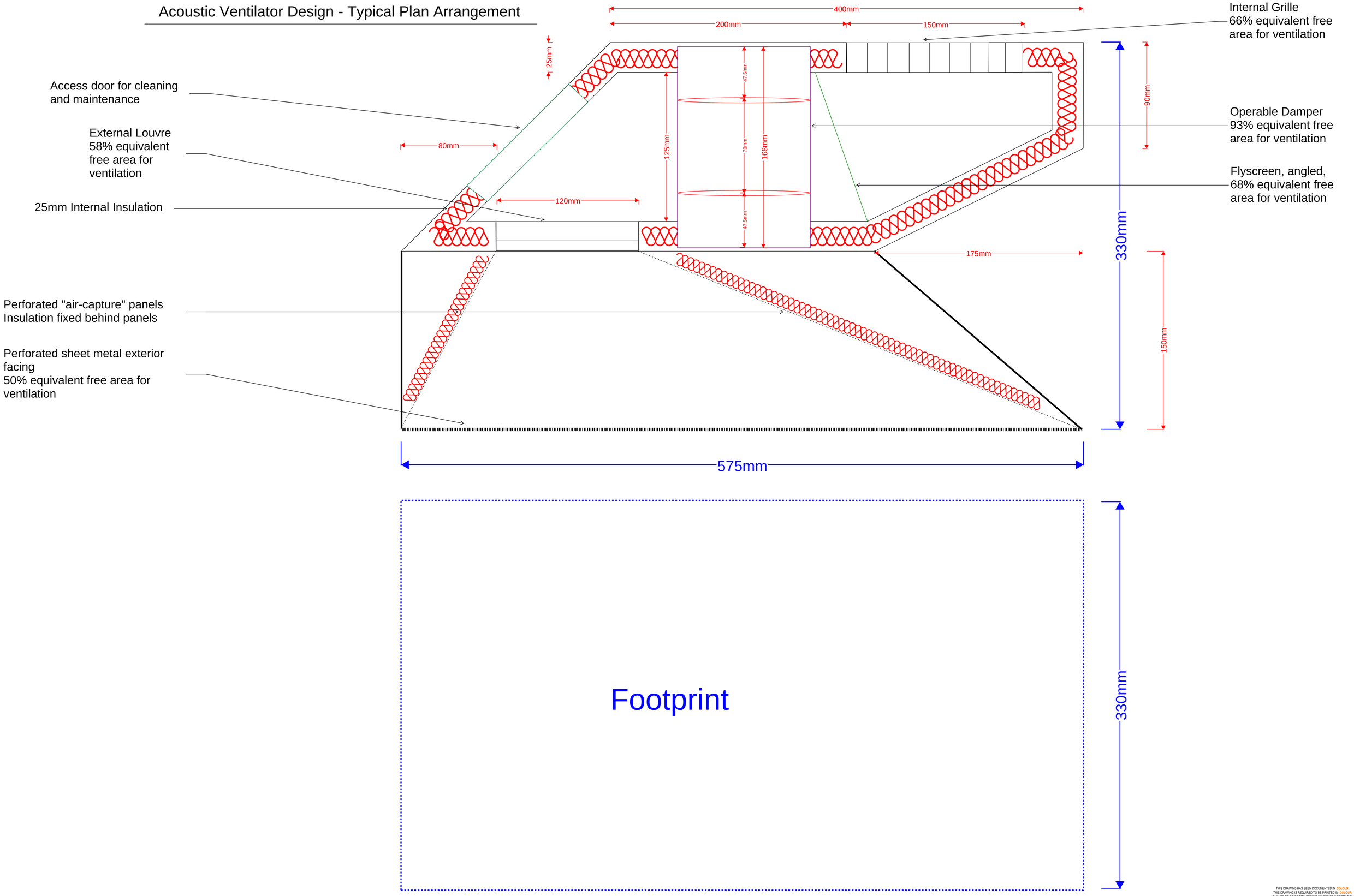


Figure 3: Velocity vector map – acoustic ventilator (in plan)



Further Detailed Acoustic Ventilator Sketch

Acoustic Ventilator Design - Typical Plan Arrangement



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REV	DESCRIPTION	DRAWN	APP'D	DATE
004	Response to City of Sydney Submission	BN	BN	21/01/21
003	Draft DA Issue	BN	BN	29/06/20
002	Milestone Package 2	BN	BN	22/05/20
001	Milestone Package 1	BN	BN	1/04/20

Waterloo Integrated Station Development
A Joint Venture Project
JOHN HOLLAND
mirvac
ARCHITECT/CLIENT

WATERLOO OVER STATION DEVELOPMENT
PROJECT

ACOUSTIC NATURAL VENTILATION DESIGN - DETAIL SHEET 1
TITLE

Stantec

PRELIMINARY
NOT FOR CONSTRUCTION
Acoustics, Noise & Vibration

SCALE @ A0	PROJECT No	DRAWING No	REV
1:1	46198	BLD2-AC-NV-D1	004