

CONSULTANT'S ADVICE NOTICE M2

To	Turner and Townsend
Attention	Tarini Pathak
Report Name	Ventilation Attributes
Project	North Sydney Public School Upgrade
Author	Duncan Cooke
Date	01/11/2021

Background

This Consultant's Advice Notice has been prepared to outline the measures included in the mechanical services design for the proposed new buildings as part of the North Sydney Public School Upgrade. This is in reply to the Response to Submission raised by Michael Yates, which is outlined below.

Response to Submission

To whom it may concern,

It is exciting to see North Sydney Demonstration School getting a substantial and long overdue upgrade. The EIS documentation sets out in quite some detail how the project will unfold and I appreciate it would have been quite difficult to put together given the restrictions placed on the team by the ongoing COVID-19 pandemic.

I would like to draw your attention to "Appendix K_Noise and Vibration Report", specifically "It would be necessary to allow for external windows and doors to be closed when compliance with the EFSG criteria is required. As it is proposed to air condition these spaces, it should be feasible to ensure that such spaces have an adequate outside air provision" (pp 5) and "In order to achieve the required internal noise levels in the new building it would be necessary to allow for most windows (south in particular) to be closed. This would necessitate an alternative means of ventilation such as air conditioning." (pp 46)

As we now know the NSW Department of Education is relying primarily on natural ventilation in order to reduce a critical risk vector in the spread of COVID-19.

Given COVID-19 and other airborne viruses are likely to be with us some time I believe it is critical to ensure the air conditioning being specified for this build meets the criteria set out by OzSAGE. Namely eight exchanges of fresh air per hour and HEPA filters.

Current and future students and staff shouldn't be forced to choose between a quiet learning environment and one that has air that is as safe as possible. The specification of correctly sized air conditioning and HEPA filters will allow them to have both.

Consultant's Reply

The proposed design delivers outside air each learning space by means of ducted mechanical ventilation and air conditioning (MVAC). This system exhausts the same amount of air as the introduced outside air, which removes contaminants from the space, allowing for windows/ doors to be closed whilst maintaining adequate outside air ventilation and air circulation to be provided to each space. The air is cooled or heated by a fan coil unit in the

ceiling, which will help de-stratify the air and reduce the chance of pockets of stagnant air, helping to dilute any airborne pathogens¹.

The provision of outside air has been increased by 50% over the minimum requirements set out in the Building Code of Australia. This provision has been made to ensure the proposed new buildings achieve a 4 Star Green Star rating with the Green Building Council of Australia. With this increased quantity of air the current design provides the following air change rates in learning spaces:

- Classrooms 7.6 air changes per hour
- Learning commons 4.8 air changes per hour
- Multipurpose rooms 8 air changes per hour

The proposed design uses carbon dioxide (CO₂) monitoring to measure the levels of contaminants in the space, which is directly related to the number of occupants in the space. Indoor ventilation dilutes exhaled CO₂ from occupants, and so the CO₂ concentration in a space is often used to help indicate ventilation rates. CO₂ concentrations that regularly exceed 1500 ppm indicate poorly ventilated spaces. The CO₂ levels are displayed in a prominent location within the classroom, and the systems are designed to operate with an upper CO₂ limit of 800 parts per million.

HEPA filtration is typically used in clean environments such as hospital operating theatres, laboratories, microchip manufacturing facilities and the like. HEPA filters are not proposed to be provided because of the relatively uncontrolled environment of the classroom in that children will be in and out of the classroom multiple times each day. Since HEPA filters have very fine pleated paper media, they can be easily clogged by coarse dust introduced by regular entry to the space from uncontrolled areas such as playgrounds. This will lead to excessive dust contamination of the HEPA filters, requiring regular replacement for limited gain.

¹ CIBSE COVID-19: Ventilation version 5
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