

Date: 17/11/2022

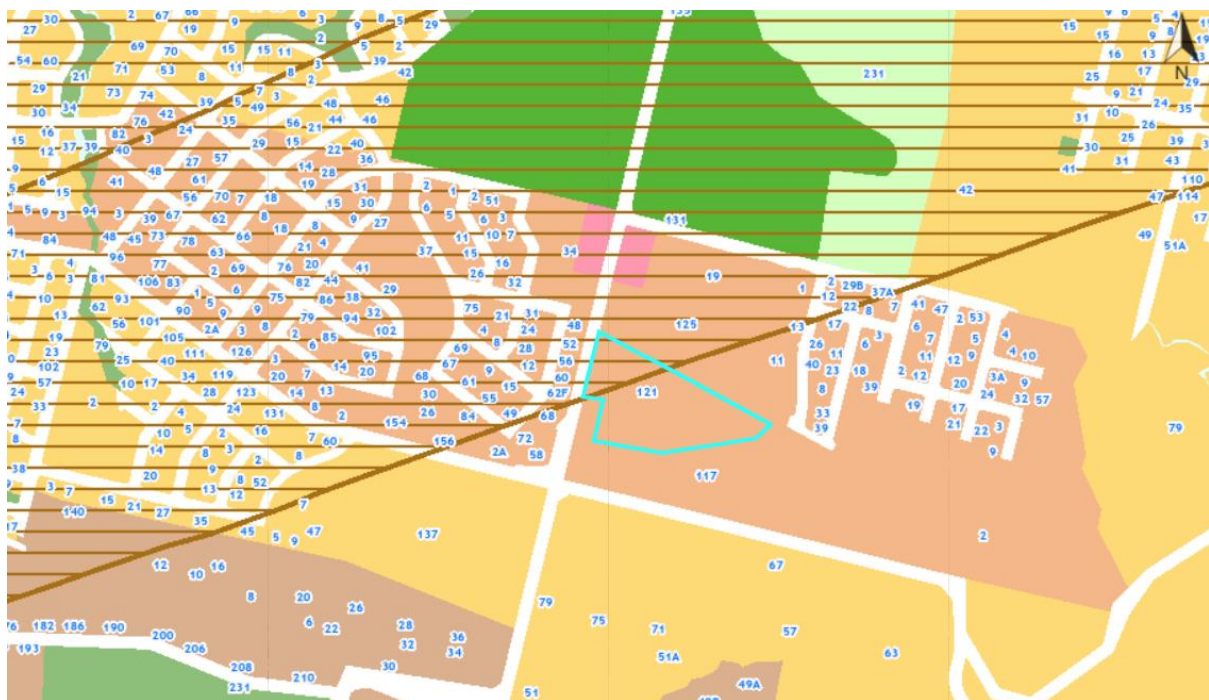
Ministry of Education  
c/o Kay Panther Knight  
Forme Planning

Email: [kay@formeplanning.co.nz](mailto:kay@formeplanning.co.nz)

**Re: Notice of Requirement, 121 Murphy's Road, Flatbush, Auckland**

Dear Kay,

The Ministry of Education (MoE) is proposing to apply for a Notice of Requirement (NOR) for a new school located at the above address. Acoustic advice is required to consider the reverse sensitivity effects to Auckland Airport due to the site being partially located within the Aircraft Noise Notification Area (ANNA), as shown below in Figure 1, in addition to typical noise operational and construction noise emissions to nearby receivers.



Residential - Mixed Housing Urban Zone

**Figure 1. Site Location (blue outline) and zoning, partially within the 55-60dB L<sub>dn</sub> ANNA (60-65dB L<sub>dn</sub> contour of the MANA shown in top left)**

An indicative proposal of the site (not yet finalised) is shown below in Figure 2, with the 55-60dB L<sub>dn</sub> airport noise contour of the ANNA also highlighted.



**Figure 2. Indicative Site Proposal (55-60dB L<sub>dn</sub> Airport noise contour highlighted red)**

### Aircraft Noise Reverse Sensitivity

As the site is partially within the 55-60dB L<sub>dn</sub> contour, school buildings within this area are subject to aircraft noise.

The following designation conditions are commonly adopted for schools to control reverse sensitivity noise effects to Auckland Airport based on Auckland Unitary Plan – Operative in Part (AUP-OP) rule D24.6.3(3), (4) and (5):

#### **D24.6.3 Auckland International Airport**

...

- (3) For educational facilities and tertiary education facilities, acoustic insulation and related ventilation and/or air conditioning systems must be installed to achieve an internal acoustic environment in each classroom (which includes any room used for teaching or research at a tertiary education facility), library and hall (which includes indoor recreational facilities at a tertiary education facility), with all external doors and windows of the classrooms, libraries and halls closed, of 40dB L<sub>dn</sub>. To achieve this, those facilities must provide:
- (a) in the case of classrooms and libraries, air conditioning and/or mechanical ventilation systems for each classroom or library that are:
- (i) designed to achieve indoor air temperatures not less than 16 degrees Celsius in winter and not greater than 27 degrees Celsius in summer;

- (ii) *capable of providing outdoor air ventilation at the rate of 8 litres of air per second per person for the maximum number of people able to be accommodated in any such room at one time (“the required airflow”);*
  - (iii) *capable of enabling (in the case of classrooms or libraries in which only mechanical ventilation systems are used to satisfy the above temperature and outdoor air requirements), the outdoor airflow to be controlled across the range, from the maximum airflow capacity down to the required airflow when all external doors and windows of the classroom or library are closed;*
  - (iv) *otherwise complying with the New Zealand Standard on Ventilation for Acceptable Indoor Air (NZS 4303:1990); and*
  - (v) *operating at a noise level of no more than 35dB  $L_{Aeq(1min)}$  in each classroom, no more than 40dB  $L_{Aeq(1min)}$  in each library, no more than 40dB  $L_{Aeq(1min)}$  in any hallway or corridor, and noise levels from the mechanical system(s) must be measured at least 1m away from any diffuser.*
- (b) *in the case of halls, either a mechanical ventilation system or mechanical ventilation systems for each hall capable of:*
- (i) *providing at least 12 litres of outdoor air per second per square metre with all external doors and windows of the hall closed;*
  - (ii) *enabling the outdoor airflow to be controlled across the range, from the maximum airflow down to the rate of 8 litres of outdoor air per second per person for the maximum number of occupants able to be accommodated in the hall at one time;*
  - (iii) *otherwise complying with the New Zealand Standard on Ventilation for Acceptable Indoor Air Quality (NZS 4303:1990); and*
  - (iv) *operating at a noise level of no more than 35dB  $L_{Aeq(1min)}$  in each hall, and no more than 40dB  $L_{Aeq(1min)}$  in any hallway or corridor. Noise levels from the mechanical system(s) must be measured at least 1m away from any diffuser, or*
- (c) *air conditioning plus mechanical outdoor air ventilation capable of:*
- (i) *providing 8 litres per second per person of outdoor air,*
  - (ii) *proving internal air temperatures in each hall not greater than 27 degrees Celsius,*
  - (iii) *providing that the mechanical system creates no more than 35dB  $L_{Aeq(1min)}$  in each hall, no more than 40dB  $L_{Aeq(1min)}$  in any hallway or corridor and noise levels from the mechanical system(s) must be measured at least 1m away from any diffuser;*
  - (iv) *otherwise complying with the New Zealand Standard on Ventilation for Acceptable Indoor Air Quality (NZS 4303:1990).*
- (4) *The required acoustic treatment measures to achieve the acoustic noise environment specified in rule D24.6.3(1), (2) and (3) must be determined by using the Future Airport Noise Contours contained in [Appendix 19 Auckland Airport Future Aircraft Noise Contours \(FANC\) – Aircraft Noise Overlay](#).*
- (5) *Upon the completion of the installation of the acoustic treatment measures the owner must provide the Council with certificates prepared by a suitably qualified and experienced:*
- (a) *acoustical consultant certifying that the acoustic treatment measures specified for the activity in this control are sufficient to achieve compliance with this control and have been undertaken in accordance with sound practice; and*
  - (b) *ventilation engineer certifying that the ventilation measures specified for the activity in this control are sufficient to achieve compliance with this control and have been undertaken in accordance with sound practice.*

The noise rule above is designed to ensure an internal noise level of 40dB  $L_{dn}$  is achieved within classrooms, libraries and halls from aircraft noise based on the Future Aircraft Noise

Contours (FANC). It should be noted that the FANC contours are only provided for 60dB  $L_{dn}$  aircraft noise and above. The AUP-OP rule D24.6.3 is only applicable to schools within the High Aircraft Noise Area (HANA) from 65dB  $L_{dn}$  or above, and the Moderate Aircraft Noise Area (MANA) from 60-65dB  $L_{dn}$ .

Upon review of the site in relation to the ANNA and MANA contours, it is estimated that aircraft noise is between an effective 50-56dB  $L_{dn}$  contour covering part of the site. Classrooms, libraries and halls within this area would require the external building fabric to provide a reduction of 15-16dB from aircraft noise to meet the internal noise limit of 40dB  $L_{dn}$ .

An open window used for natural ventilation/cooling typically provides a noise reduction of 15-17dBA from outside to inside depending on the orientation of the window/hinge/open area. This demonstrates that the internal noise criterion of 40dB  $L_{dn}$  can be readily achieved with natural ventilation via open windows based on the external aircraft noise levels of 55-56dB  $L_{dn}$  across part of the site.

With closed windows and typical lightweight façade constructions found in MoE school designs (i.e. timber framed external walls, warm roof and CAC 35+ ceiling tiles and 4mm glass / 12mm airspace / 4mm glass double glazing), noise reductions of 25dB or more are easily achievable.

On the basis that the internal noise limit of 40dB  $L_{dn}$  can be achieved with natural ventilation via open windows and lightweight façade constructions, no designation condition is required to control reverse sensitivity noise effects to Auckland Airport.

### **Operational and Construction Noise Emissions**

The proposed site and surrounds are in the Residential – Mixed Housing Urban Zone. The following MoE Standard Designation Condition is proposed to control operational and construction noise from the site to the closest receivers:

**Noise**

*The noise (rating) level arising from the operation of the school must comply with the following noise levels when measured within the boundary of any residentially zoned site:*

<b>Time</b>	<b>Noise Level</b>
Monday to Saturday 7am-10pm	55dB $L_{Aeq}$
Sunday 9am-6pm	
All other times	45dB $L_{Aeq}$ 75dB $L_{AFmax}$

*These noise limits do not apply to noise from school sports and school recreational activities occurring between 8am and 6pm Monday to Saturday.*

*Noise levels shall be measured and assessed in accordance with NZS 6801:2008 “Measurement of Environmental Sound” and NZS 6802:2008 “Environmental Noise”.*

*Noise from construction shall not exceed the limits recommended in, and shall be measured in accordance with, New Zealand Standards NZS 6803:1999 “Acoustics – Construction Noise”.*

The above noise rule is a suitable designation condition to address operational noise from the site and is expected to be readily achievable due to the separation distances between receiver boundaries.

If you have any questions regarding the above, please let me know.

Kind regards,



Matthew Bronka MASNZ MIOA  
 Director and Principal  
 Bladon Bronka Acoustics Ltd.