

To: Garrett Crowe
From: Jim Antonopoulos
Date: 3 May 2023
Subject: Emmanuel College - Year 9 Centre
Environmental Noise Review

At: Baldasso Cortese
At: SLR Consulting Australia Pty Ltd
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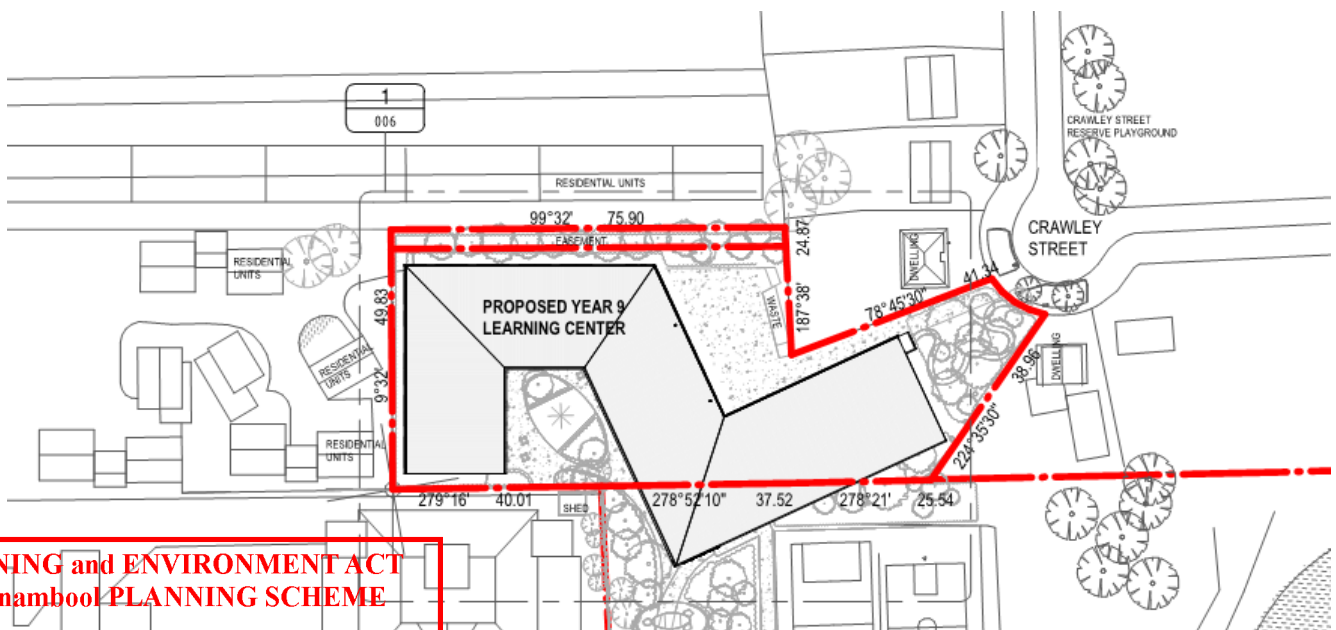
SLR Consulting Australia Pty Ltd (SLR) have been retained by Emmanuel College to undertake acoustical consulting services for the proposed Year 9 Centre.

SLR has provided ongoing advice on architectural, building and services noise. This memorandum addresses environmental noise impacts associated with mechanical plant and equipment at the new development.

1 Introduction

The proposed year 9 Centre is located along the northern boundary of the school, and is near residential boundaries to the north and north east. The extract below shows the general location of the new building relative to the boundary and nearby residential uses.


Figure 1 General Layout of building and surrounding residential uses



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The residential uses are:

- A row of dwellings along the north (30 Hopetoun Road)
- Dwellings to the north-east and east (15 and 10 Crawley Street being the closest)

All dwellings are single storey, and standard timber paling fences are provided at the boundary. The northern boundary fence is approximately 7 m from the proposed building façade.

2 Noise Requirements

Noise from the school mechanical plant and equipment is required to meet the noise provisions of the Environment Protection Act 2017.

Specific noise criteria are nominated in the following subordinate legislation:

- *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues*, Publication 1826 (the Noise Protocol).
- *Noise guidelines: Assessing low frequency noise*, EPA Publication 1996 (Low Frequency Guideline).

The Noise Protocol prescribes noise limits that are required to be met at noise sensitive areas, being near a residential dwelling (generally within 10m of the dwelling, but within the boundary of the residential use).

Noise limits are based on background noise levels in the area as well as land use zoning. Based on the land use zoning, the determined day period noise limit (applicable from 7 am to 6 pm weekdays) would be **50 dBA¹**.

In relation to the Low Frequency Guideline, the following noise threshold are generally to be met.

Table 1 Outdoor one-third octave low frequency noise threshold levels from 10 Hz to 160 Hz

Outdoor one-third octave low frequency noise threshold levels													
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
Leq (dB)	92	89	86	77	69	61	54	50	50	48	48	46	44

3 Review of Mechanical Plant

SLR has undertaken a review and calculations of noise from mechanical services plant and equipment based on the current design.

Notable sources of noise with the potential to impact the residential uses include:

- Rooftop air conditioning plant.
- Ground level dust extraction system located near the northern boundary, part of the Makers Space.
- Kitchen rangehood booster / exhaust fans discharging along the north-east façade of the Food Tech building.
- Smaller general exhaust fans also discharging on the north and east.

¹ The site and residential receivers are within the Warrnambool Major Urban Area Boundary and as such the urban method applies under the Noise Protocol. While background noise levels have not been collected, we would expect they would be 'neutral and as such the zoning based noise limits would be applicable.

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PERMIT NO. PA2201869

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Sheet 2 of 5


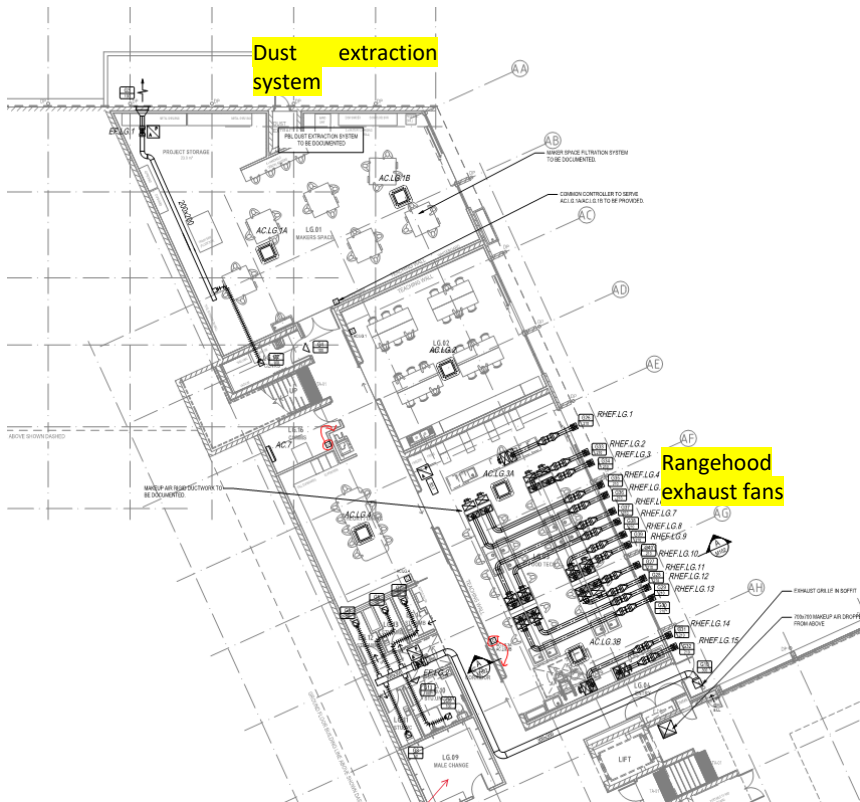
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Figure 2 Lower Ground level mechanical services layout



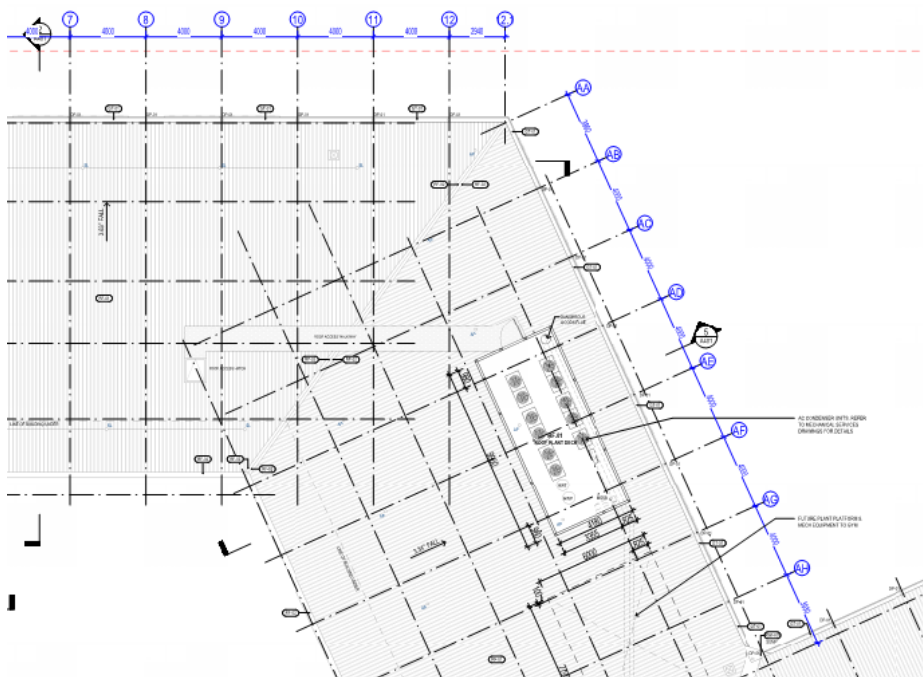
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Warrnambool PLANNING SCHEME**

PERMIT NO. PA2201869

**ENDORSED PLAN
Sheet 3 of 5**

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Date: 16/6/2023

Figure 3 Roof layout – AC Plant Deck



SLR has been provided with noise data for all exhaust fans and condenser units associated with the rooftop plant. Calculations have been undertaken to check compliance with both the Noise Protocol noise limits and the Low Frequency Guideline.

The table below provides as summary of the units / noise sources and necessary acoustic treatments to achieve compliance.

Unit	Servicing (location of equipment)	Manufacturer Make / Noise Data (L, M, H speed) and Acoustic treatments required
External Condenser Units and Packaged Units		
AC Condenser Units CU.1 to CU.6	All areas Roof Deck	<p>Mitsubishi Units: PURY-P200YNW-A1 (-BS) PURY-P450YNW-A1 (-BS) PURY-P500YNW-A1 (-BS)</p> <p>Units on dedicated roof deck. Deck to include full perimeter solid acoustic screens (6mm cement sheet or 1mm thick steel) constructed to the height of the top of the units. Two openings (1500mm wide for access) acceptable at north and east end of the screens only.</p> <p><u>Roof Deck platform:</u> -At least 250 mm above roof deck on dedicated steel structure -2 x 12 mm compressed fibre cement sheet flooring -All condensers on rubber pads so as to achieve not less than 95% vibration isolation efficiency (allow for 24 mm thick pads)</p>
General Ventilation / Outside Air Fans		
Rangehood Booster Fans RHEF LG1-15	Food Tech	Fantech JETLINE-200ECO rated at 49 dBA at 3 m. Will comply with EPA regulations at nearest residential use.
EF LG.1	Cleaners	Selection rated at 40 dBA at 3 m. Will comply with EPA regulations at nearest residential use
EF LG.2	Lower Ground Toilets	Selection rated at 51 dBA at 3 m. Will comply with EPA regulations at nearest residential use
Fume Cupboard Fan	Prep Area	<p>Polyfan VSB30</p> <p>Keep shielded from residential areas to north and east (ie ensure no line of sight from fan to residents). May benefit from being located next to the condenser unit platform / screen.</p> <p>50mm thick acoustic lining to inlet ductwork (say 1200 mm long) will assist in reducing noise to Prep Area (not related to environmental noise)</p>

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Warrnambool PLANNING SCHEME**

PERMIT NO. PA2201869

**ENDORSED PLAN
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Date: 16/6/2023

Unit	Servicing (location of equipment)	Manufacturer Make / Noise Data (L, M, H speed) and Acoustic treatments required																														
Dust Extraction Fan	Makers Space	<p>Supplier to provide unit that achieves the following noise levels:</p> <table border="1"> <thead> <tr> <th>Frequency, Hz</th> <th>63</th> <th>125</th> <th>250</th> <th>500</th> <th>1k</th> <th>2k</th> <th>4k</th> <th>8k</th> <th>dBA</th> </tr> </thead> <tbody> <tr> <td>Lw, dB</td> <td>80</td> <td>76</td> <td>73</td> <td>72</td> <td>72</td> <td>71</td> <td>71</td> <td>68</td> <td>78</td> </tr> <tr> <td>Lp at 3 m, dB</td> <td>62</td> <td>58</td> <td>56</td> <td>54</td> <td>54</td> <td>53</td> <td>53</td> <td>50</td> <td>61</td> </tr> </tbody> </table> <p>Unit to be in dedicated enclosure with solid core door for access. Final unit selection to be reviewed by SLR when available.</p>	Frequency, Hz	63	125	250	500	1k	2k	4k	8k	dBA	Lw, dB	80	76	73	72	72	71	71	68	78	Lp at 3 m, dB	62	58	56	54	54	53	53	50	61
Frequency, Hz	63	125	250	500	1k	2k	4k	8k	dBA																							
Lw, dB	80	76	73	72	72	71	71	68	78																							
Lp at 3 m, dB	62	58	56	54	54	53	53	50	61																							

The above advice has generally been implemented in the design and we expect full compliance with the EPA noise legislation at the nearest residential uses.

Yours sincerely



Jim Antonopoulos BAppSc MAAS

Technical Director – Acoustics and Vibration

Checked: DW

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Sheet 5 of 5**

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