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Environmental Noise Assessment

Upgrades to Orange Grove Primary School
2-8 Perry Street, Lilyfield, NSW

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1.0 CONSULTING BRIEF

This Environmental Noise Assessment has been prepared to accompany a Review of Environmental Factors (REF) for an activity proposed by the Department of Education under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI).

Day Design Pty Ltd was engaged by School Infrastructure NSW to carry out an acoustic assessment of the proposed new building, Building J, and associated REF works at Orange Grove Public School, 2-8 Perry Street, Lilyfield, NSW.

This commission involves the following:

Scope of Work:

- Inspect the site and environs
- Measure the background noise levels at critical locations and times
- Establish acceptable noise level criteria
- Quantify noise emissions from the proposed REF works
- Calculate the level of noise emission, taking into account building envelope transmission, screen walls and distance attenuation
- Prepare a site plan identifying the development and nearby noise sensitive locations
- Provide recommendations for acoustical treatment (if necessary)
- Prepare an Environmental Noise Assessment Report.

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments* (the Guidelines) by the Department of Planning, Housing and Infrastructure.

This report examines and takes into account the relevant environmental factors in the Guidelines and *Environmental Planning and Assessment Regulations 2021* under Section 171(1) of the EP&A Regulation as outlined in Table 1.



Table 1 Part 5 Guidelines

EP&A Regulation Section 171(1) Guidelines for Division 5.1 Assessment Section			
	Requirement	Response	Report Section
<u>a) the environmental impact on the community</u>	(a2) assessment of impacts post-construction (including from any development, activity, public-address systems and sirens, signage, events, hours of operation, or out of hours use of facilities, helicopter facilities, emergency facilities).	A noise assessment has been conducted in accordance with Noise Policy for Industry and SEPP (Transport and Infrastructure) 2021. All new noise sources to be introduced to the site as a result of the proposed activity have been assessed, including noise from additional learning spaces, new mechanical plant and relocated waste collection. Compliance with the relevant noise criteria will be achieved, provided noise controls are implemented as per Section 5.0.	Noise emission and predicted noise level assessment – Section 4.0. Mitigation measures – Section 5.0.



Table 1 Part 5 Guidelines - Continued

EP&A Regulation Section 171(1) Guidelines for Division 5.1 Assessment Section			
	Requirement	Response	Report Section
<u>d) reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality</u>	(d1) assessment of impacts onto adjoining properties and public spaces (particularly in residential areas) such as lighting impacts and light spill, acoustic, visual privacy, noise and vibration (including from helicopters and ambulances), visual amenity, solar access, view loss and view sharing, vistas, overshadowing, local character, streetscape, weather factors such as wind impacts i. the above should be considered from any proposed development or activity on the development site, public-address system, ambulance siren, flashing signage, event, hours of operation, or out of hours use of school facility, helicopter facility, emergency facility, research centre where hazardous material is being used or stored and any potential incident, etc	This report assesses all new sources of noise emission from the proposed works on the site, specifically noise from new learning spaces, mechanical plant and the relocated waste collection. No reduction in the acoustic amenity of the locality is expected as a result of the proposed works.	Noise emission and predicted noise level assessment – Section 4.0. Mitigation measures – Section 5.0.



Table 1 Part 5 Guidelines - Continued

EP&A Regulation Section 171(1) Guidelines for Division 5.1 Assessment Section			
Guidelines for Division 5.1 Assessment Section	Requirement	Response	Report Section
<u>l) pollution of the environment</u>	(l1) assessment of any pollution during construction and post construction eg air (including odours and greenhouse gases); water (including runoff patterns, flooding/tidal regimes, water quality health); soil (including contamination, erosion, instability risks); noise and vibration (including consideration of sensitive receptors); light pollution; waste, including hazardous waste	The impact of potential noise emissions has been assessed at the surrounding sensitive receiver locations, and is found to be within acceptable limits.	Sensitive receiver locations – Section 2.0. Acoustic criteria derived – Section 3.0. Noise emission and predicted noise level assessment – Section 4.0. Mitigation measures – Section 5.0.
<u>o) the cumulative environmental effect with other existing or likely future activities</u>	(o1) The cumulative effects of noise and impacts to the road network from surrounding existing and approved developments	The proposed works at the site will not influence the level of noise emission from the road network. Waste collection has been assessed, however waste vehicle movements along Rayner Street are not expected to change from existing or increase noise emission.	Description of proposed works – Section 2.0 Noise emission and predicted noise level assessment – Section 4.0.



2.0 PROJECT DESCRIPTION & SUMMARY OF FINDINGS

Orange Grove Public School is a co-educational primary school located at 2-8 Perry Street, Lilyfield. The site has street frontage to Perry Street, Balmain Road, Emmerick Street and Rayner Street. The site comprises 15 allotments with a total area of 17,956m² including:

- Lots 21 & 22 Deposited Plan (DP) 3796;
- Lots 1 & 5 DP 114899;
- Lot 1 DP 122488;
- Lot 1 DP 169451;
- Lots 1 – 3 DP 312710;
- Lot 1 DP 449967;
- Lots 1 & 2 DP 925435;
- Lot 1 DP 931891;
- Lot 1 DP 1037366; and
- Lot 102 DP 1160224.

The existing permanent buildings on the site include:

- **Building A:** Two-storey, neo-Georgian, inter-war brick building built in 1928 containing administration and staff areas, along with 7 homebases/classrooms;
- **Building B:** Single storey, pre-WW1 brick structure containing 4 homebases;
- **Building C:** Single storey brick building containing library and music rooms;
- **Building D:** Single storey 'L' shaped building (c. 1894) containing 6 homebases;
- **Building E:** Single storey pre-school building facing Balmain Road;
- **Building G:** Amenities building;
- **Building H:** Canteen; and
- **Building I:** Storage Shed.

Demountable classrooms are located in the north-eastern and north-western corners of the school site. A Covered Outdoor Learning Area (COLA) is located centrally within the site. The COLA links Buildings A, B and C. Playing areas are located on the northern, western and eastern boundaries of the site.

OGPS is comprised of four school buildings containing general learning spaces (GLSs), amenities, library, staff and administration areas, outdoor playing areas and car park.

OGPS caters for up to 585 students from preschool to Year 6. Following the proposed upgrades to OGPS, the school will be able to cater for up to 611 students.



The proposed activity is for upgrades to Orange Grove Public Primary School and comprises the following:

- **Demolition of** Building C;
- **Removal of** ancillary structures – paths, fencing;
- **Removal of** posts on sports courts (to be undertaken in consultation with the school);
- **Removal of** existing assembly Covered Outdoor Learning Area (COLA) south of Building C;
- **Removal of** portable classroom buildings;
- **Removal of** one (1) tree;
- **Construction of** a three-storey building (Building J);
- **Construction of** a COLA south of Building J;
- **Use of** a portable buildings for the purpose of a library during construction works;
- Associated works including stormwater drainage works, services works including installation of a substation, installation of an onsite detention tank, waste storage facilities, landscaping and fencing

Mechanical plant, including but not limited to air conditioning condenser units and exhaust fans, will be required to serve the proposed Building J.

OGPS is bounded by Perry Street to the north, Balmain Road to the east, residential premises to the south, and by residential premises and Emmerick Street to the west. Residential premises are also located on the other side of Perry Street to the north, Balmain Street to the east and Emmerick Street to the west.

Perry Street to the north is zoned SP2 - *Classified Road*, while the surrounding residential premises to the north, east and west are zoned R1 – *General Residential*. The site and surrounding residential premises are shown on Figure 1.



The nearest noise sensitive receptors to the proposed Building J at *OGPS*, in various directions, are shown on Figure 1 and are as follows in Table 2.

Table 2 Noise Sensitive Receptors

Receptor and Type	Address	Direction from site
R1 – Residential	3 Perry Street	North
R2 – Residential	2 Fredbert Street	North
R3 – Residential	315 Balmain Road	East
R4 – Residential	20 Rayner Street	South
R5 – Residential	17 Emmerick Street	Southwest
R6 – Residential	34 Emmerick Street	West
R7 (a & b) – Residential	25 Rayner Street	South

Each residential receptor location has been selected to represent the adjacent residential premises, eg ‘R1’ and ‘R2’ are representative of all residential receptors further north of *OGPS* etc.

The existing hours of operation for the site includes the following:

- **School:** Monday to Friday (during school term), 9 am to 3 pm;
- **Preschool:** Monday to Friday (during school term), 9 am to 3 pm;
- **Out of School Hours Care:** Monday to Friday (during school term), 7 am to 9 am and 3 pm to 6 pm;
- **Vacation Care:** Monday to Friday (during school holidays), 7 am to 6 pm; and
- **Organic Markets:** Saturdays, 8 am to 1 pm (set up from 7 am, pack down to 4 pm) and up to 4 special occasions per year not on a Saturday.

This proposal has been undertaken in accordance with the NSW Department of Planning and Environment’s (DoPE) *State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021* and the NSW Environment Protection Authority’s (EPA) *Noise Policy for Industry (NPI)*.

An acoustic assessment of the noise from teaching areas (GLSs & SLs) in Building J and the proposed mechanical plant is required, to ensure the noise impact of these proposed works at *OGPS* will not adversely affect the acoustic amenity of the nearby residences.

Calculations show that the level of noise emission, subsequent to the construction of the new facilities at *OGPS*, will meet the acoustic requirements in Section 3.0 of this report.





Figure 1 - Location Plan – Orange Grove Public School, 2-8 Perry Street, Lilyfield, NSW.



3.0 ACOUSTIC CRITERIA

3.1 Measured Ambient Noise Levels

In order to assess the severity of a possible environmental noise problem in a residential area it is necessary to measure the ambient background noise level at the times and locations of worst possible annoyance. The lower the background noise level, the more perceptible the intrusive noise becomes and the more potentially annoying.

Fact Sheet A: Determining existing noise levels, Section A1 of the NPI states the following in relation to determining background noise levels:

Background noise levels need to be determined before intrusive noise can be assessed. The background noise levels to be measured are those that are present at the time of the noise assessment and without the subject development operating. For the assessment of modifications to existing premises, the noise from the existing premises should be excluded from background noise measurements. The exception is where the premises has been operating for a significant period of time and is considered a normal part of the acoustic environment; it may be included in the background noise assessment under the following circumstances:

- the development must have been operating for a period in excess of 10 years in the assessment period/s being considered and is considered a normal part of the acoustic environment; and*
- the development must be operating in accordance with noise limits and requirements imposed in a consent or licence and/or be applying best practice.*

Any ambient noise measurements must also take into consideration the noise contribution to the surrounding area from the existing operations of *OGPS*, as they form part of the existing acoustic environment during the school term – some noise from the operation of the school is typical/expected in this area.

Section B1.1 'Instrument requirements and siting', paragraph 2 of the *NPI* requires monitoring to take place at a 'site that is truly representative of the noise environment at the residence'.

Section B1.2 'Measurement procedure', point 2, of the *NPI* specifies that monitoring should take place for 'each day of the week the proposed development will be operating and over the proposed operating hours'.

Monitoring took place during the school term, and excluded the noise emission associated with *OGPS*'s outdoor play times (recess and lunch).

The ambient L_{90} background noise level is a statistical measure of the sound pressure level that is exceeded for 90% of the measuring period (typically 15 minutes).



The Rating Background Level (RBL) is defined by the Environment Protection Authority (NSW) as the median value of the (lower) tenth percentile of L_{90} ambient background noise levels for day, evening or night periods, measured over a number of days during the proposed days and times of operation.

The places of worst possible annoyance are the nearby residential dwellings to the north, east, south west of the proposed building, as shown in Figure 1 as 'R1', 'R2', 'R3', 'R4', 'R5' and 'R6', as these residences are closest to the proposed works. The times of worst possible annoyance will be during the day when *OGPS* is operating. Consideration has also been given residences to the south at 'R7', specifically for noise emission from waste collection at the proposed waste pad.

Ambient noise levels were measured at the northern and southern sides of the *OGPS* site, shown as Location 'A' and Location 'B' on Figure 1 respectively. The noise monitor at Location 'A' was approximately 4.5 metres above ground level, and recorded noise levels from Tuesday 26 July to Thursday 4 August, 2022. The noise monitor at Location 'B' was approximately 1.5 metres above ground level, and recorded noise levels from Tuesday 26 July to Tuesday 2 August, 2022.

The noise monitors at Location 'A' and Location 'B' are considered to be representative of ambient noise levels at the residential receivers to the north and south respectively.

The day time ambient noise levels are presented in the attached Appendix B, and also below in Table 3.

Table 3 Ambient Noise Levels – 2-8 Perry Street, Lilyfield, NSW

Noise Measurement Location	Time Period	L_{90} Rating Background Level	Existing L_{eq} Noise Level
Location 'A' – Northern Boundary, 2-8 Perry Street	Day (7 am to 6 pm)	50 dBA	63 dBA
Location 'B' – Southern Boundary, 2-8 Perry Street	Day (7 am to 6 pm)	44 dBA	61 dBA

Meteorological conditions during the testing typically consisted of overcast and clear skies, with temperatures ranging from 6 to 25°C. Noise measurements are considered reliable and typical for the receptor areas.



3.2 SEPP (Transport and Infrastructure) 2021

The NSW Department of Planning and Environment (DoPE) published the State Environmental Planning Policy (SEPP) (Transport and Infrastructure) 2021 on 1 March 2022, which consolidated the SEPP (Education and Child Care Facilities) 2017. The relevant parts of the SEPP to this proposal have been extracted and are revised below.

Part 2.3, Division 17, Section 2.120 of the SEPP 2021 states the following in regards to developments affected by road traffic noise:

“2.120 Impact of road noise or vibration on non-rail development

- 1) *This section applies to development for any of the following purposes that in on land in or adjacent to the road corridor for a freeway, a tollway or a transitway or any other road with an annual average daily traffic volume of more than 20,000 vehicles (based on the traffic volume data published on the website of TfNSW) and that the consent authority considers is likely to be adversely affected by road noise or vibration -*
 - a) *Residential accommodation,*
 - b) *A place of public worship,*
 - c) *A hospital,*
 - d) *An educational establishment or child care centre.*
- 2) *Before determining a development application for development to which this section applies, the consent authority must take into consideration any guidelines that are issued by the Secretary for the purposes of this clause and published in the Gazette.”*

While the proposed development at OGPS is **not** a complying development as per the SEPP 2021, ‘Schedule 6 Schools – Complying development’ of the SEPP provides a guideline for acceptable noise criteria that may be applied to new or existing school buildings. In the absence of other legislative criteria for noise emission from new school buildings, Schedule 6 provide useful guidance as to what an acceptable noise criteria may be. Schedule 6 reads as follows:

‘6 Noise

A new building or (if the development is an alteration or addition to an existing building for the purpose of changing its use) an existing building that is to be used for the purpose of a school or school-based child care must be designed so as not to emit noise exceeding an L_{Aeq} of 5 dB(A) above background noise when measured at any lot boundary.’

Also, ‘Schedule 8 Schools – design quality principles’ of the SEPP requires the following:

‘Principle 5. Amenity

Schools should provide pleasant and engaging spaces that are accessible for a wide range of educational, informal and community activities, while also considering the amenity of adjacent development and the local neighbourhood.’



3.3 NSW Environment Protection Authority

3.3.1 NSW Noise Policy for Industry

The NSW Environment Protection Authority (EPA) published the *Noise Policy for Industry* (NPI) in October 2017. The NPI is specifically aimed at assessing noise from industrial noise sources listed in Schedule 1 of the Protection of the Environment Operations Act 1997 (POEO, 1997).

The NPI provides a framework to assess noise emission from a premises, and whether that premises produces intrusive or non-intrusive noise and/or maintains the acoustic amenity.

Section 1.4 of the NPI specifies the types of industrial noise sources the policy is designed for, such as mechanical plant and equipment and vehicle movements within the premises and/or on private roads, etc. In addition, Section 1.5 of the NPI lists the type of noise sources to which the policy does not apply to, which includes '*noise sources covered by regulation (domestic/neighbourhood uses)*'.

The NPI **is not** applicable (Section 1.5 of the NPI - see above) to noise associated with students engaged in active/passive play in the outdoor/indoor areas of an educational establishment. However, the amenity noise levels may be used as a screening test to establish whether further investigation into the likely effects, if any, on the acoustic amenity (as per the SEPP) of the local area is warranted.

Section 2.1 of the NPI states the following:

"Intrusive noise levels are only applied to residential receivers (residences). For other receiver types identified in Table 2.2, only the amenity levels apply."

3.3.1.1 Project Intrusiveness Noise Levels

The EPA states in Section 2.3 of its NSW NPI (October 2017) that the intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (represented by the L_{Aeq} descriptor), measured over a 15-minute period, does not exceed the rating background noise level by more than 5 dB when beyond a minimum threshold (EPA NPI, 2017, Section 2.3).

The RBLs at Location 'A' and Location 'B' were 50 dBA and 44 dBA during the day (see Table 3). Therefore, the acceptable L_{eq} noise intrusiveness criteria in this area is:

For residential receptors 'R1', 'R2', 'R3' and 'R6'

- $(50 + 5 =) 55 \text{ dBA } L_{eq, 15 \text{ minute}}$ during the day; and

For residential receptors 'R4', 'R5' and 'R7'

- $(44 + 5 =) 49 \text{ dBA } L_{eq, 15 \text{ minute}}$ during the day.



3.3.1.2 Project Amenity Noise Levels

Depending on the type of area in which the noise is being made, there is a certain reasonable expectancy for noise amenity. The NSW *NPI* provides a schedule of recommended L_{eq} industrial noise levels that under normal circumstances should not be exceeded. If successive developments occur near a residential area, each one allowing a criterion of background noise level plus 5 dB, the ambient noise level will gradually creep higher.

The recommended L_{eq} noise levels in Table 4 are taken from Section 2.4, Table 2.2 of the *NPI*.

Table 4 Amenity Noise Levels

Receiver	Noise Amenity Area	Time of Day	L_{eq} , dBA, Recommended Amenity Noise Level
Residential	Suburban	Day	55
		Evening	45
		Night	40
School classroom - internal	All	Noisiest 1-hour period	35
Active recreative area (eg school playground, golf course)	All	When in use	55

The L_{Aeq} is determined over a 15-minute period for the project intrusiveness noise level and over an assessment period (day, evening and night) for the project amenity noise level. This leads to the situation where, because of the different averaging periods, the same numerical value does not necessarily represent the same amount of noise heard by a person for different time periods. To standardise the time periods for the intrusiveness and amenity noise levels, the *NPI* assumes that the $L_{Aeq,15min}$ will be taken to be equal to the $L_{Aeq,period} + 3$ decibels (dB) (Section 2.2, *NPI*).

Compliance with the amenity criteria will limit ambient noise creep. **Section 2.4** of the *NPI* states the following:

*"To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a **project amenity noise level** applies for each new source of industrial noise as follows:*

- **Project amenity noise level for industrial developments = recommended amenity noise level (Table 2.2) minus 5 dB (A).**



The existing L_{eq} noise levels at Location 'A' and Location 'B' were 63 dBA and 61 dBA (see Table 3) during the day. As these measurements were affected by road traffic noise levels, the acceptable amenity criteria for the residential receptors in this area is:

For residential receptors 'R1', 'R2', 'R3' and 'R6'

- $(55-5+3 =) 53$ dBA $L_{eq, 15 \text{ minute}}$ during the day.

For residential receptors 'R4', 'R5' and 'R7'

- $(55-5+3 =) 53$ dBA $L_{eq, 15 \text{ minute}}$ during the day.

3.4 Project Specific Noise Criteria

Noise emissions from the use (indoor classes, mechanical plant and waste collection) of the new school building and alterations will be assessed against the criteria outlined within *Schedule 6, Part 6 - Noise of the SEPP*.

3.4.1 Residential Receivers

For Residential Receivers 'R1', 'R2', 'R3' and 'R6' – Based on measured noise levels at Location 'A'

- $(50 + 5 =) 55$ dBA during the day for all noise associated with the use of the new Buildings J, mechanical plant associated with the new development, and use of the new waste pad.

For Residential Receivers 'R4', 'R5' and 'R7' – Based on measured noise levels at Location 'B'

- $(44 + 5 =) 49$ dBA during the day for all noise associated with the use of the new Buildings J, mechanical plant associated with the new development, and use of the new waste pad.



4.0 SCHOOL NOISE EMISSION

The main sources of noise from the proposed new building at *OGPS* will be as follows:

- Students inside the proposed new classrooms; and
- Mechanical plant for new building.

As the proposed new COLA will be of the same size and in the same location as the existing COLA, noise emission from this area is not expected to change as a result of the proposed works.

The noise assessment was based on the drawings by PTW Architects, dated 13 January 2026, attached as Appendix C.

4.1 General Learning Spaces Noise Emissions

Based on the potential future population of 611 students, we have assumed that half of these students will be situated within Building J at *OGPS*. Across the proposed 10 new classrooms (GLSs and SLs), we have therefore assumed an average class size of 30 students per class.

During normal classroom activities, the main source of noise will be from the teachers and students talking within the GLSs. We have assumed that there may be a maximum of 1/3 of the students talking normally – 10 students. We have also assumed that the teacher in each classroom may be talking loudly.

Calculations assume students are distributed evenly throughout the inside of the classrooms and windows or doors to external areas are open (50% of window area), where applicable.

Day Design Pty Ltd has previously measured and quantified the Octave Band Centre Frequency sound power level of teachers and students talking at different noise levels. The $L_{eq, 15 \text{ minute}}$ sound power levels of teachers and students are shown in Table 5.

Table 5 $L_{eq, 15 \text{ minute}}$ Sound Power Levels – Teacher & Students – GLSs

Description	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)								
	dBA	63	125	250	500	1k	2k	4k	8k
Teacher talking loudly	80	59	61	70	77	76	72	65	56
School student talking normally	63	53	53	60	63	58	53	52	47
1 teacher and 10 students	81	64	65	73	78	77	73	67	60



4.2 Mechanical Plant Noise Emissions

New items of mechanical plant are proposed for the new Building J, as well as an upgrade to the existing substation on the eastern Site boundary. While preliminary locations and types of plant have been nominated, not all items of plant have been selected. Therefore, a preliminary noise assessment will be conducted based on typical units for the size of the development, with sound power levels from typical units and currently selected units being used.

Based on the mechanical services drawings prepared by NDY, dated 18 November 2024, attached as Appendix D, the following items of mechanical plant are noted with regard to potential noise emissions:

- Building J:
 - o Ground Floor: Two outdoor condensers (one a VRF) in a services room in the north-eastern corner, fire pump within pump room with louvred doors in north-eastern corner, outdoor air fan intaking from northern façade and garbage exhaust fan discharging to southern façade;
 - o Level 1: Three outdoor condensers (two VRFs) in a services room in the north-eastern corner, outdoor air fan intaking from northern façade, toilet exhaust fan and two garbage exhaust fans all ducted to rooftop exhaust;
 - o Level 2: Same as Level 1.
- Upgraded substation.



The $L_{eq, 15 \text{ minute}}$ sound power levels used in the calculation of the noise contribution from mechanical plant are presented in Table 6.

Table 6 $L_{eq, 15 \text{ minute}}$ Sound Power Levels - Mechanical Plant

Description	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)								
	dBA	63	125	250	500	1k	2k	4k	8k
Small exhaust fan (toilet) ¹	60	51	47	50	53	59	43	36	31
Supply air fan ²	62	58	64	58	59	57	56	49	43
Hydraulic lift motor ³	63	59	61	55	59	58	56	52	48
Exhaust air fan (garbage/general/toilet) ⁴	69	67	69	63	66	63	63	57	52
Medium (double fan) outdoor condenser unit ⁵	69	55	55	61	67	64	62	59	45
VRF condenser unit ⁶	83	86	87	83	82	77	75	67	61
Padmount substation – typical	55	63	67	58	51	45	40	44	38

Once mechanical plant selection has been finalised, a final assessment should be made, prior to the issue of a Construction Certificate/detailed design stage.

¹ Spectral sound power level based on Fantech TD-500/150 SIL.

² Spectral sound power level based on Fantech RDS0508KP9/10

³ Spectral sound power level based on a residential lift system previously measured by Day Design.

⁴ Spectral sound power level based on Fantech RVLE0568KP6/10

⁵ Spectral sound power level based on Daikin RZQ140LV1 outdoor condenser unit.

⁶ Spectral sound power level based on Daikin RXQ34THY1A(E) unit.



4.3 Waste Collection

A new waste pad is proposed to be located along the southern boundary of the Site, as indicated in Figure 1. We have been advised that *OGPS* has engaged a waste services provider, who will empty one front lift bin (approximately 2 m³) two times a week. These two waste collection events do not occur at set times throughout the week, but could be at any time during the day but outside of school hours (i.e. 3 pm to 6 pm Monday to Friday, or 8 am to 6 pm Saturday and Sunday).

We have assumed that one garbage truck may arrive and enter the site through the southern gate on Rayner Street in any 15-minute period during the day. Based on previous measurements and assessments, we have assumed that truck movements and garbage collection will take up to 5-minutes. As waste collection will occur outside of school hours, we have not assessed waste collection noise cumulatively with other noise from *OGPS*.

The Sound Exposure Level⁷ sound power level and spectra of vehicle noise is shown below in and is based on previous measurements by Day Design.

Table 7 SEL & L_{Amax} Sound Power Levels – Waste Collection

Description	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)								
	dBA	63	125	250	500	1k	2k	4k	8k
SEL of garbage truck movements at approximately 10 km/h	98	102	99	94	93	93	92	88	83

⁷ SEL is the total sound energy of a single noise event condensed into a one second duration.



4.4 Predicted Cumulative Noise Level at Receptor Locations

4.4.1 Cumulative Noise Level – Learning Areas & Mechanical Plant

The cumulative noise impact from the proposed learning areas and mechanical plant associated with Building J and the upgraded substation is calculated to the nearest most reasonably affected residential facades in accordance with Section 3.4 of this report, and shown in Table 8.

Table 8 Predicted Cumulative L_{eq} , 15 minute Noise Levels – Learning Areas & Mechanical Plant

Receptor Location	Predicted L_{eq} Noise Level (dBA)	Acceptable L_{eq} Noise Level (dBA)	Compliance
R1 – 3 Perry Street			
- Classrooms	45		
- Mechanical plant	47		
Cumulative Noise Level	49	55	Yes
R2 – 2 Fredbert Street			
- Classrooms	41		
- Mechanical plant	42		
Cumulative Noise Level	44	55	Yes
R3 – 315 Balmain Road			
- Classrooms	25		
- Mechanical plant	22		
Cumulative Noise Level	27	55	Yes
R4 – 20 Rayner Street			
- Classrooms	40		
- Mechanical plant	26		
Cumulative Noise Level	40	49	Yes
R5 – 17 Emmerick Street			
- Classrooms	37		
- Mechanical plant	35		
Cumulative Noise Level	39	49	Yes



Table 8 Predicted Cumulative L_{eq} , 15 minute Noise Levels –Learning Areas & Mechanical Plant – Continued

Receptor Location	Predicted L_{eq} Noise Level (dBA)	Acceptable L_{eq} Noise Level (dBA)	Compliance
R6 – 34 Emmerick Street			
- Classrooms	34		
- Mechanical plant	39		
Cumulative Noise Level	40	55	Yes
R7a – 25 Rayner Street			
- Classrooms	23		
- Mechanical plant	<20		
Cumulative Noise Level	24	49	Yes
R7b – 25 Rayner Street			
- Classrooms	22		
- Mechanical plant	<20		
Cumulative Noise Level	24	49	Yes

The predicted cumulative level of noise from the learning areas and mechanical plant at the closest receptor locations 'R1' to 'R7' complies with the criteria in Section 3.4 of this report, and is therefore acceptable.



4.4.2 Noise Emission – Waste Collection

The calculated noise impact from the collection of waste from the new waste pad at the southern boundary of *OGPS* is calculated to the nearest most reasonably affected residential façades in accordance with Section 3.4 of this report, and shown in Table 9. Noise emission from waste collection has been considered separately, as waste collection will occur outside of school hours in the absence of the other noise sources assessed in this report.

Table 9 Predicted L_{eq} , 15 minute Noise Levels –Waste Collection

Receptor Location	Predicted L_{eq} Noise Level (dBA)	Acceptable L_{eq} Noise Level (dBA)	Compliance
R1 – 3 Perry Street	<20	55	Yes
R2 – 2 Fredbert Street	<20	55	Yes
R3 – 315 Balmain Road	21	55	Yes
R4 – 20 Rayner Street	42	49	Yes
R5 – 17 Emmerick Street	35	49	Yes
R6 – 34 Emmerick Street	22	55	Yes
R7a – 25 Rayner Street	43	49	Yes
R7b – 25 Rayner Street	49	49	Yes

The predicted level of noise from the collection of waste at the closest receptor locations ‘R1’ to ‘R7’ complies with the criteria in Section 3.4 of this report, and is therefore acceptable. Recommendations are provided in Section 5.0 to ensure that noise emission from waste collection will remain within the criteria outlined in Section 3.4.



4.4.3 Fire Pump Room

The proposed fire pump⁸ to be located within the ground floor level of Building J has the potential to create significant noise emissions within the immediate surroundings during its operation. The criteria in Section 3.4 of this report is not suitable for assessing noise emission from an emergency system such as the fire pump.

There is no clear guideline for assessing noise emission from an emergency pump system, however Australia Standard AS1668 provides some guidance regarding noise emission from emergency fire ventilation systems, and outlines a maximum noise level of 80 dBA in occupied spaces. Considering this as a guide for potentially acceptable levels of noise emission, we recommend the noise level generated by the fire pump is no greater than 80 dBA in 'occupied spaces'.

The public footpath north of Building J is approximately 19 m from the fire pump room. Taking this distance and the attenuation from the pump room itself⁹ into consideration, the noise level from the operating fire pump is expected to be between $L_{Aeq, 15 \text{ min}}$ 80-81 dBA on the public footpath. This level of noise emission is found to be acceptable, with the potential 1 dB exceedance being considered negligible¹⁰.

The servicing and maintenance schedule for the fire pump, in line with AS1851-2012, is as follows:

- Monthly – 10 mins diesel fire pump test;
- Six-monthly – 10 mins diesel fire pump test;
- Yearly – 50 mins diesel fire pump test.

Considering the infrequency of its operation, we are advised that noise emission from the fire pump will be managed operationally, as outlined in Section 5.1.3.

⁸ Alton A-48S-H diesel fire pump engine, sound power level 118 dBA.

⁹ Sound power level is calculated to be 113 dBA at the louvred façade of the pump room.

¹⁰ See Table 4.1 of the NSW Environment Protection Authority's Noise Policy for Industry.



5.0 MITIGATION MEASURES

5.1 General Requirements

5.1.1 Mechanical Certification

For typical mechanical plant equipment with sound power levels not exceeding those listed in Table 6, it is reasonable and feasible to acoustically treat the plant area or equipment itself so that noise will not impact the neighbouring properties.

Once mechanical plant selection has been finalised, a detailed acoustic assessment should be made, prior to the detailed design stage. We recommend that the mechanical services engineers select mechanical plant equipment with the lowest sound power levels to reduce the amount of acoustic treatment necessary to achieve the noise criteria at nearby receivers.

We offer to provide detailed noise controls when specifications of the mechanical plant equipment have been finalised.

5.1.2 Waste Collection Scheduling

To eliminate the potential for sleep disturbance, and to minimise the overall level of noise impact for neighbouring residences, we recommend that waste collection be scheduled to occur only between the daytime hours of 7 am to 6 pm, and to not occur during school hours.

5.1.3 Summary

Table 10 Mitigation Measures

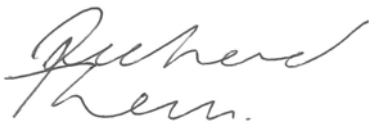
ID	MM Name	Mitigation Measure	Timing
NV3	Operational Noise	A suitably qualified acoustic engineer must demonstrate that noise associated with the operation of mechanical plant or machinery installed does not exceed the relevant project noise trigger levels.	Prior to commencement of Operations
NV4*	Acoustic Compliance	Compliance with the recommendations of the Environmental Noise Assessment prepared by Day Design Pty Ltd, dated March 2026.	Design
NV8*	Operational Noise	Waste collection is to be scheduled outside of school hours and only during the day (7 am to 6 pm). Fire pump maintenance is to be scheduled in accordance with AS1851-2012, and is to occur outside of school hours and only during the day (7 am to 6 pm).	Operation



6.0 NOISE IMPACT STATEMENT

Day Design Pty Ltd was engaged by School Infrastructure NSW to carry out an acoustic assessment of two proposed new building, Building J, and associated REF works at Orange Grove Public School, 2-8 Perry Street, Lilyfield, NSW.

Calculations show that the level of noise emitted from the new building and mechanical plant at *OGPS* will meet the acoustic requirements of the NSW Department of Planning and Environment's *SEPP (Transport and Infrastructure) 2021*, and the NSW Environment Protection Authority's (EPA) *Noise Policy for Industry*, as detailed in Section 3.0 of this report, and be considered acceptable.



Ricky Thom, BA, BE(Mech)Hons, MEnvScMgt, MIEAust

Acoustical Engineer

for and on behalf of Day Design Pty Ltd

AAAC MEMBERSHIP

Day Design Pty Ltd is a member company of the Association of Australasian Acoustical Consultants, and the work herein reported has been performed in accordance with the terms of membership.

APPENDICES

- Appendix A – Noise Survey Instrumentation
- Appendix B – Ambient Noise Survey
- Appendix C – Architectural Drawings dated 13 January 2026
- Appendix D – Mechanical Services Drawings dated 18 November 2024



APPENDIX A – NOISE SURVEY INSTRUMENTATION

Noise level measurements and analysis were made with instrumentation as follows in Table A:

Table A Noise Instrumentation

Description	Model No.	Serial No.
Infobyte Noise Logger	iM4	107
Condenser Microphone 0.5" diameter	MK 250	107
Infobyte Noise Logger	iM4	112
Condenser Microphone 0.5" diameter	MK 250	112

An environmental noise logger is used to continuously monitor ambient noise levels and provide information on the statistical distribution of noise during an extended period of time. The Infobyte Noise Monitors iM4 #107 and #112 are Type 2 precision environmental noise monitors meeting all the applicable requirements of AS1259 for an integrating-averaging sound level meter.

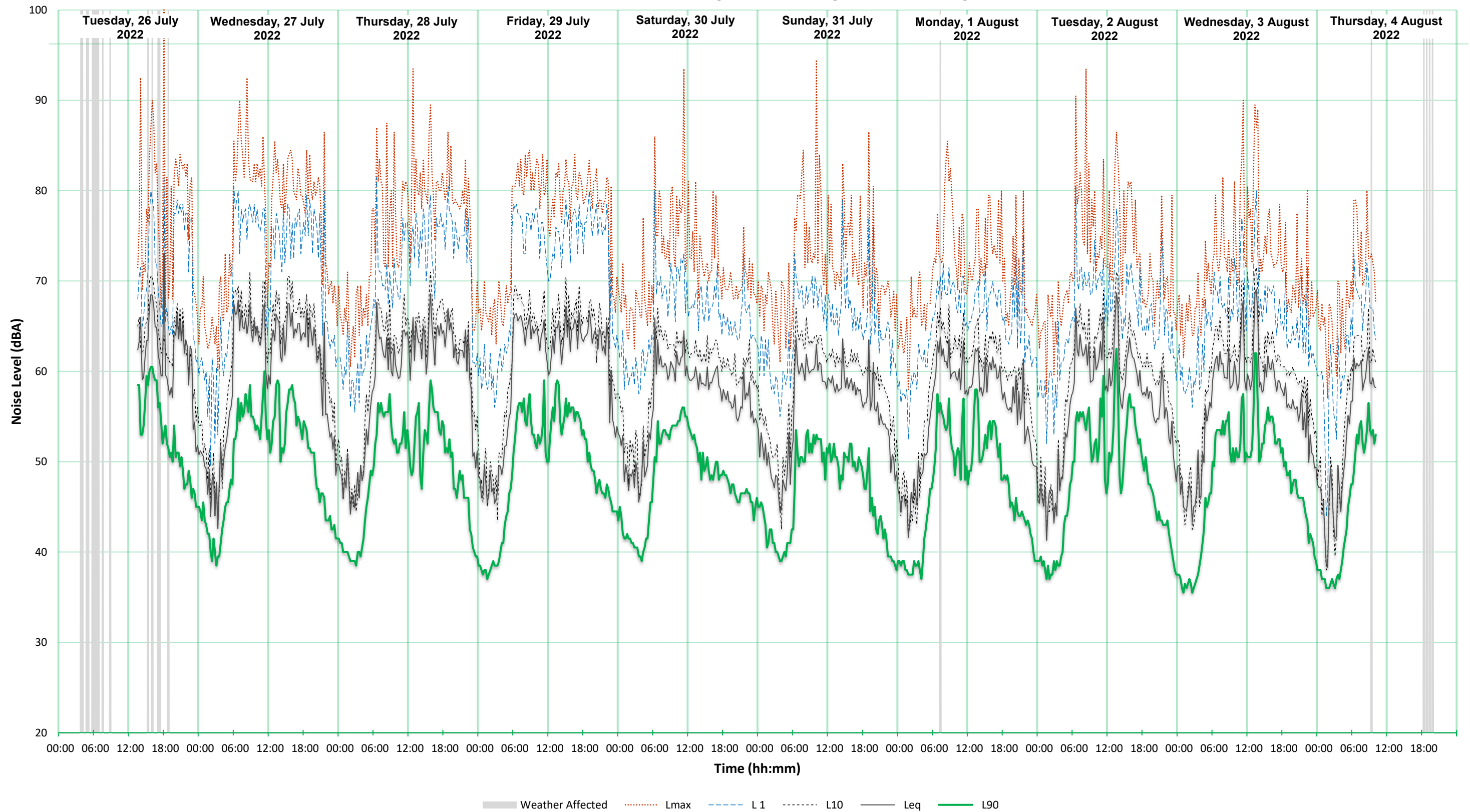
All instrument systems had been laboratory calibrated using instrumentation traceable to Australian National Standards and certified within the last two years thus conforming to Australian Standards. The measurement system was also field calibrated prior to and after noise surveys. Calibration drift was found to be within 1 dB for long-term measurements. No adjustments for instrument drift during the measurement period were warranted.



AMBIENT NOISE SURVEY

7572-4.1
Appendix B

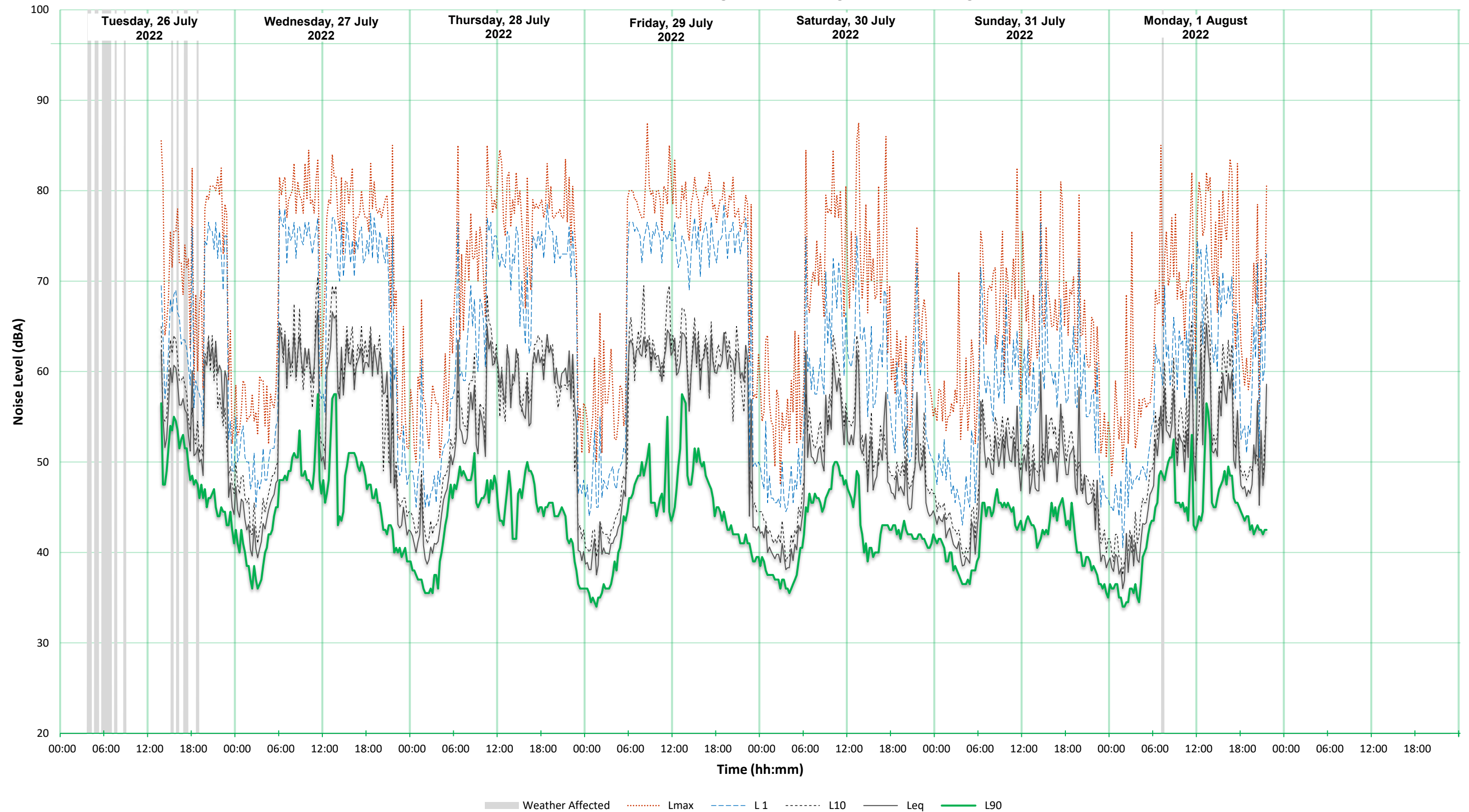
Located at Northern Boundary, 2-8 Perry Street, Lilyfield, NSW

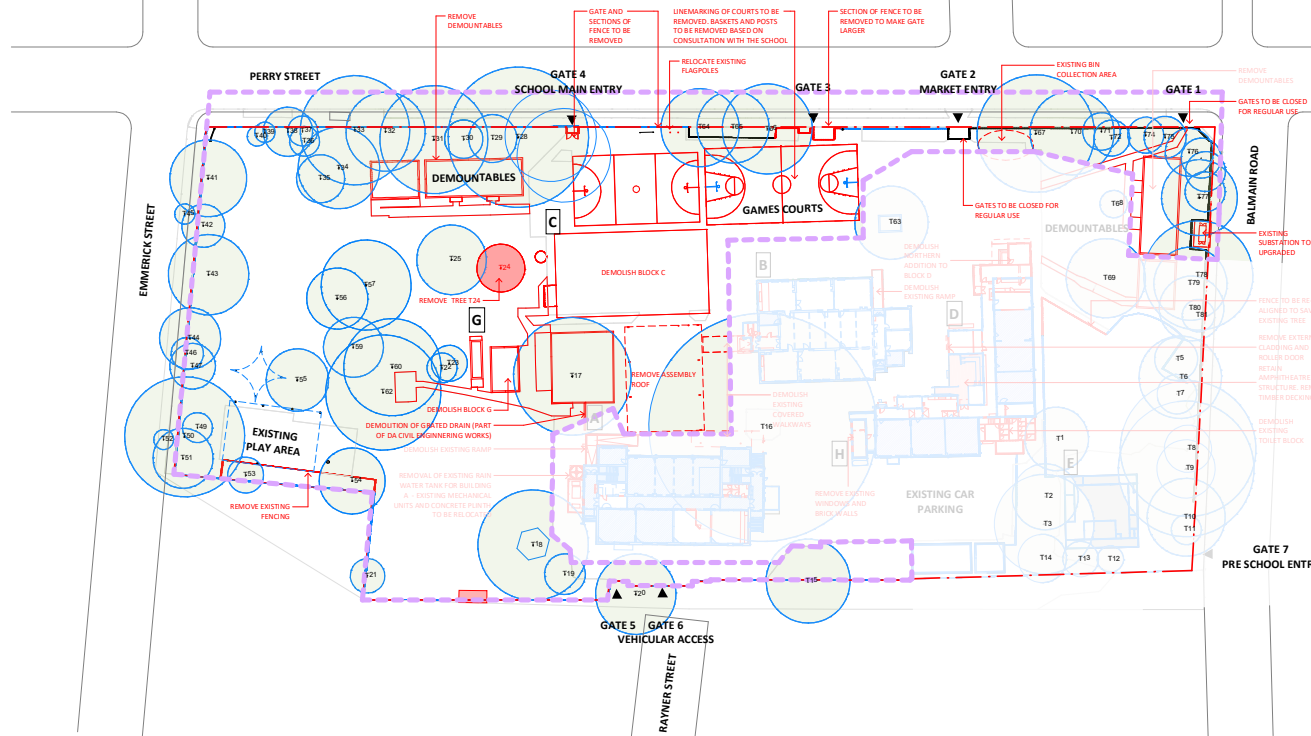


AMBIENT NOISE SURVEY

7572-4.1
Appendix B

Located at Southern Boundary, 2-8 Perry Street, Lilyfield, NSW





1 SITE PLAN - OVERALL DEMOLITION
1 : 500 @A1

- LEGEND**
- SITE BOUNDARY
 - - - SITE SETBACK LINES
 - FOR REF (BOUNDARY, BUILDING I AND COLA)
 - PARK AND WALK ZONE
 - PICK UP/DROP OFF ZONE
 - EXISTING BUILDINGS
 - DEMOLITION WORK
 - PROPOSED WORK
- LEGEND - TREES**
- TREE PROTECTION ZONE (TPZ)
 - TREE TO BE REMOVED (T24 ONLY)

Key Plan:

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02	REF SUBMISSION	RCL	DS	25/12/11
03	REF SUBMISSION	RCL	DS	25/09/12
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11	70% SD SUBMISSION	FI	DS	24/12/10
12	FOR INFORMATION	DS	DS	24/09/10

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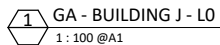
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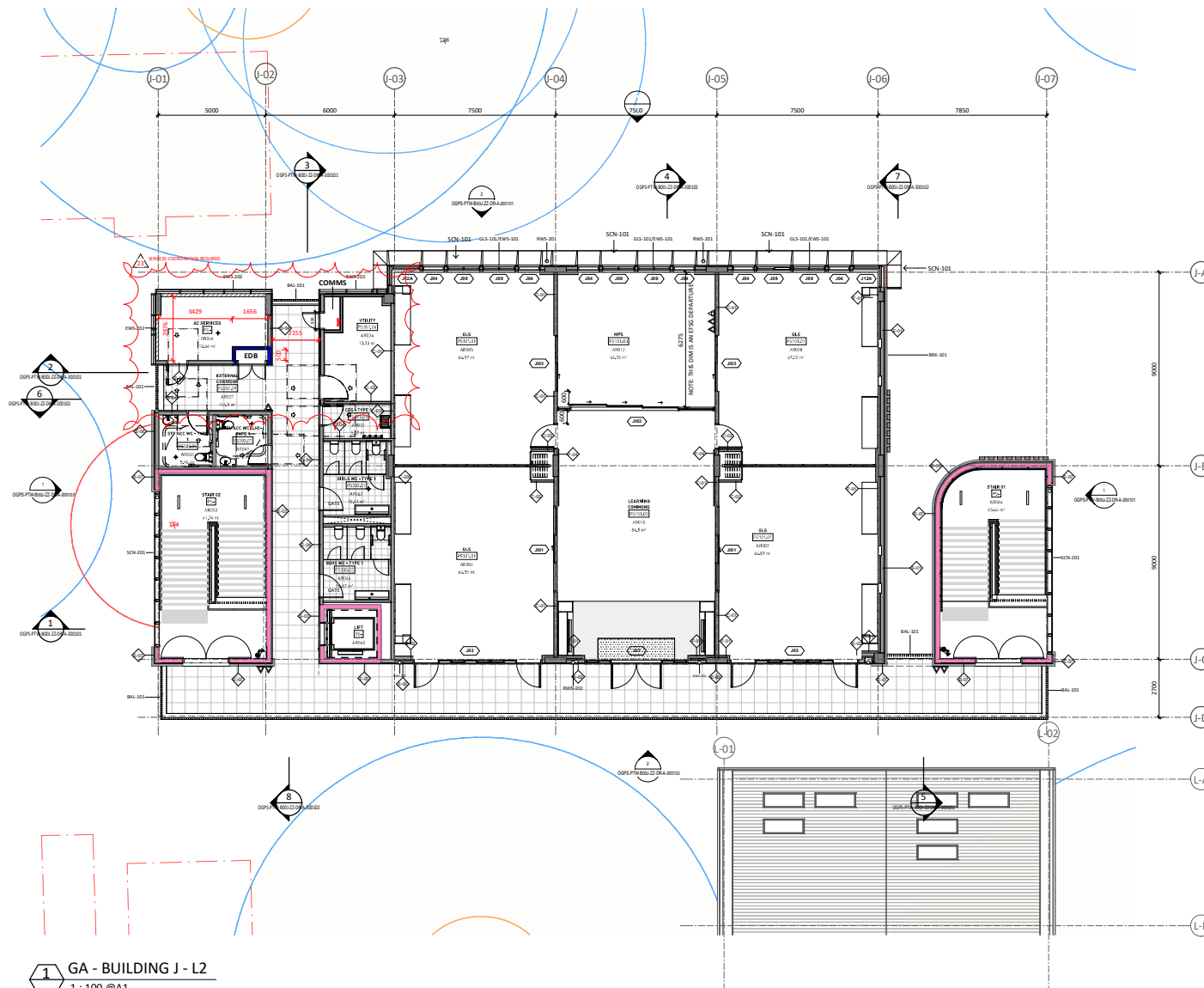
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02 - SITE PLANS
SITE PLAN - OVERALL DEMOLITION

Drawing Number OGPS-PTW-ZZ-L0-DR-A-020002
Revision 24

Status
REF SUBMISSION







LEGEND - WALL FIRE RATING	
Blue	NO/NO/NO
Red	120/120/120
Orange	180/180
Yellow	180/180

REFER TO SHEET
OGPS-PTW-ZZ-XX-DR-A-400101
FOR WALL TYPES

LEGEND - TREES

- Blue circle: TREE PROTECTION ZONE (TPZ)
- Orange circle: STRUCTURAL ROOT ZONE (SRZ)
- Tx: TREE NUMBER

Key Plan:



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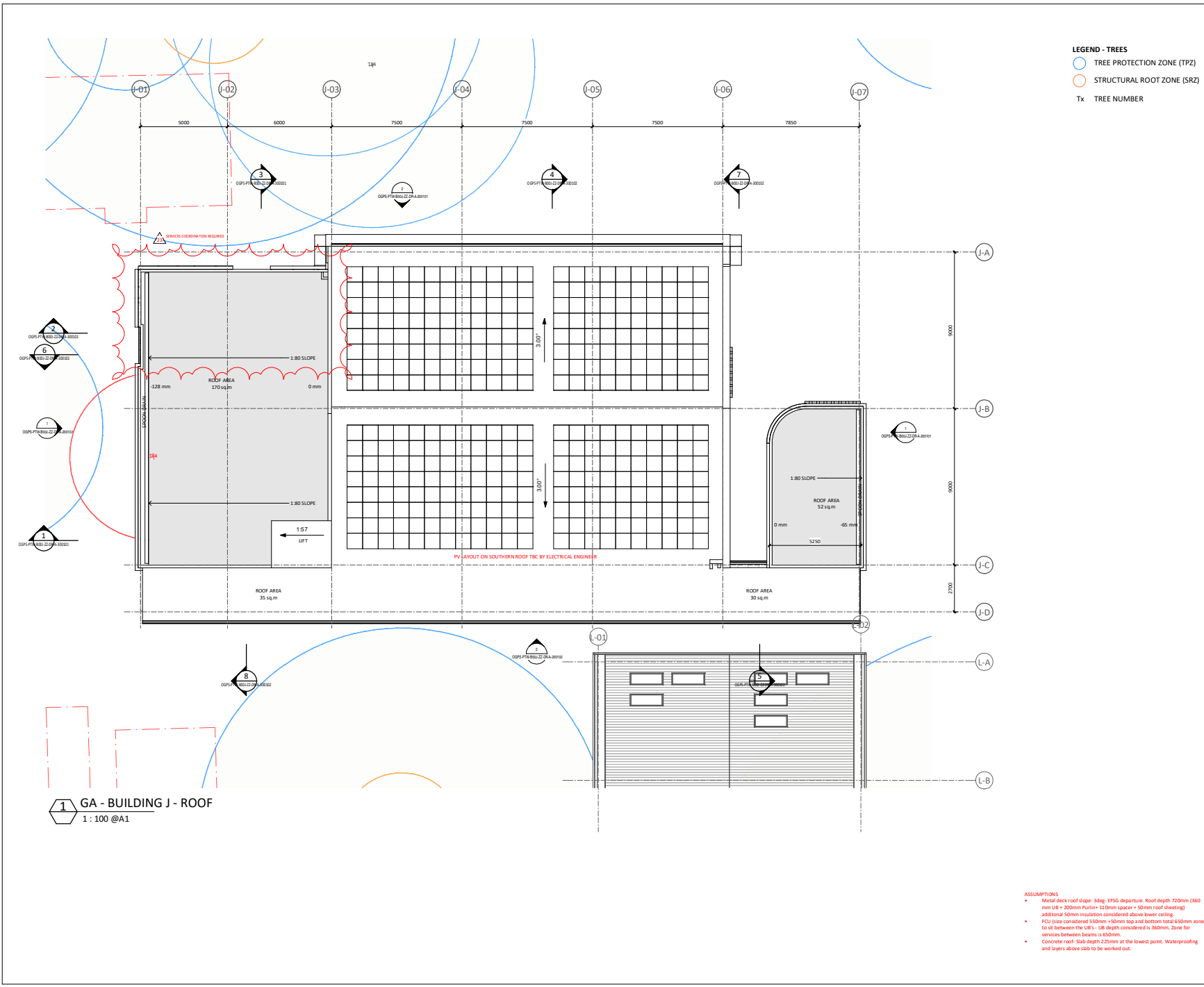
Orange Grove Public School
Perry St, Lilyfield NSW 2040

Title
10 - GENERAL ARRANGEMENT PLANS
GA - BUILDING J - L2

Drawing Number
OGPS-PTW-800J-L2-DR-A-100103

Revision
24

Status
REF SUBMISSION



LEGEND - TREES

- TREE PROTECTION ZONE (TPZ)
- STRUCTURAL ROOT ZONE (SRZ)
- Tx TREE NUMBER

Key Plan:

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Rev **Amendment** **By** **Chk*** **Date**

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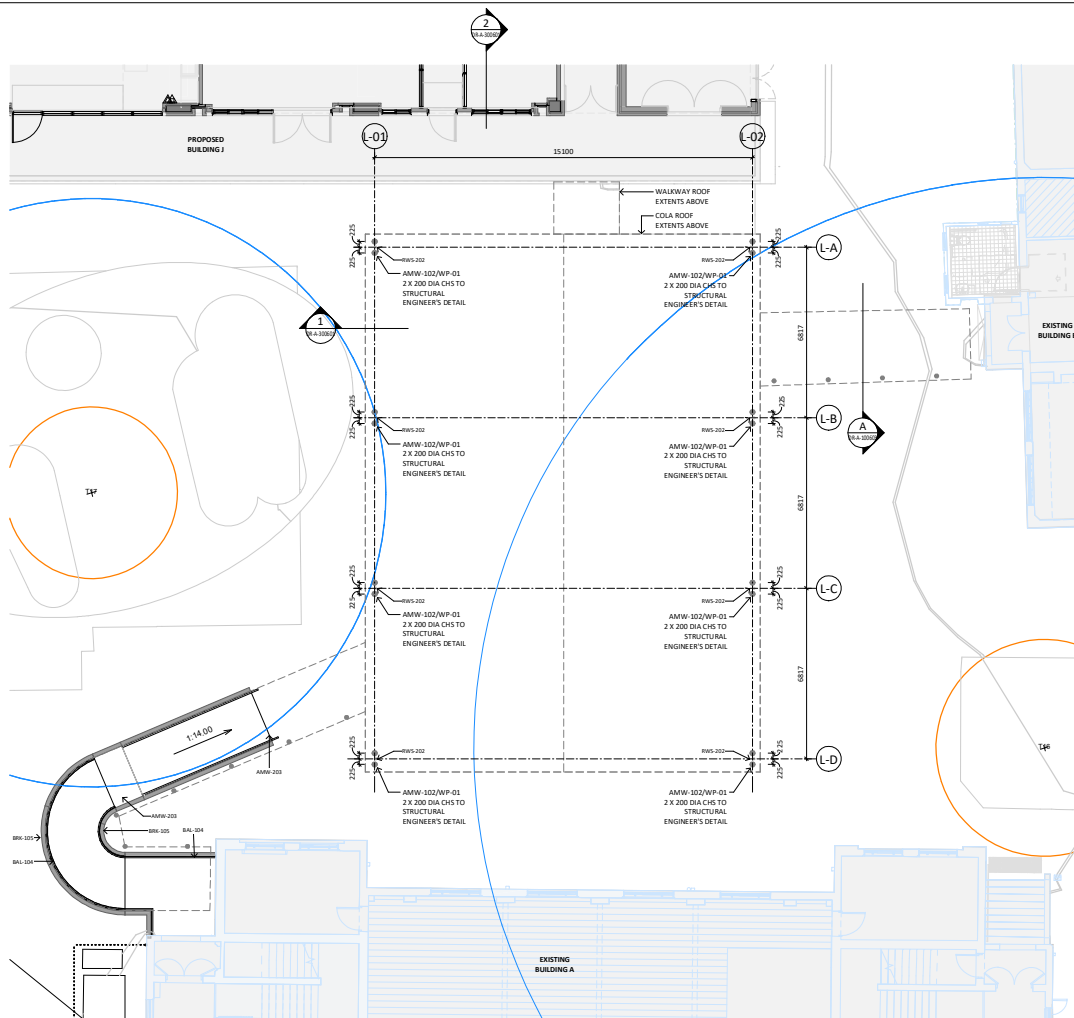
Project PA030519
Orange Grove Public School
Perry St, Lilyfield NSW 2040

Title
10 - GENERAL ARRANGEMENT PLANS
GA - BUILDING J - ROOF

Drawing Number OGPS-PTW-800J-RF-DR-A-100104 **Revision** 24

Status
REF SUBMISSION

- ASSUMPTIONS**
- Metal deck roof slope: 3deg: EPSG departure. Roof depth 720mm (360 mm UB + 200mm Purlin+ 110mm spacer + 50mm roof sheeting) additional 50mm insulation considered above lower ceiling.
 - FCU (size considered 550mm x 50mm top and bottom total 650mm zone) to sit between the UB's - UB depth considered is 360mm. Zone for services between beams is 650mm.
 - Concrete roof slab depth 225mm at the lowest point. Waterproofing and layers above slab to be worked out.



1 GA - COLA - L0
1 : 100 @A1

LEGEND

- REF BOUNDARY
- TREE PROTECTION ZONE (TPZ)
- STRUCTURAL ROOT ZONE (SRZ)
- Tx TREE NUMBER

Key Plan:

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02	100% SD SUBMISSION	DS	DS	24/11/09

Rev Amendment By Chk* Date

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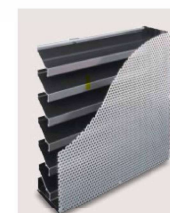
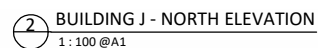
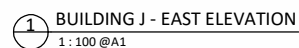
NSW Nominated Architects
S Parsons Architect No.6098
D Jones Architect No.4778

Project: PAD30519
Orange Grove Public School
Perry St, Lilyfield NSW 2040

Item
10 - GENERAL ARRANGEMENT PLANS
GA - COLA - L0

Drawing Number	Revision
OGPS-PTW-ZZ-L0-DR-A-100601	24

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01	FOR INFORMATION	PC	DJ	24/09
08	FORM FOR SUBMITTAL	PC	DJ	24/09

Rev	Amendment	By	Chk*	Date
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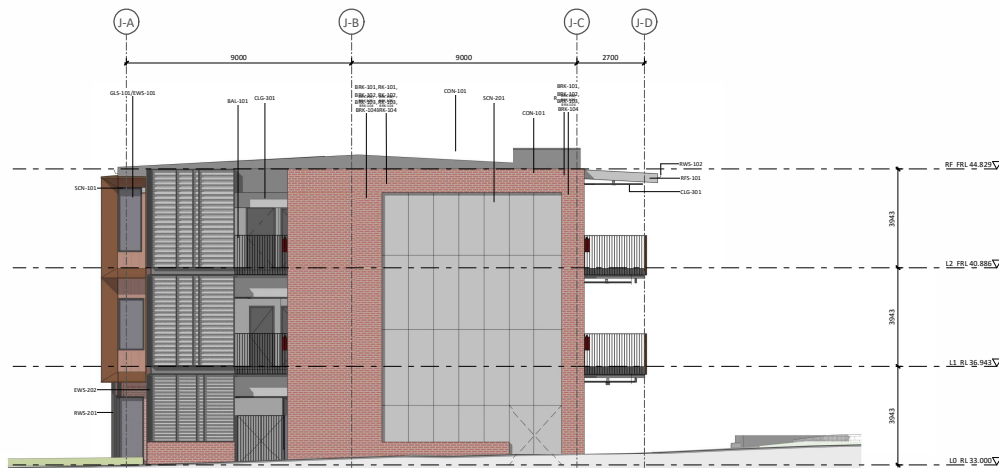
NSW Nominated Architects
S Parsons Architect No.6098
D Jones Architect No.4778

Project PA030519
Orange Grove Public School
Perry St, Lilyfield NSW 2040

Title
20 - ELEVATIONS
ELEVATIONS - BUILDING J - NORTH , EAST

OGPS-PTW-B001-77-DR-A-200101 24

Status	REF SUBMISSION
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1 BUILDING J - WEST ELEVATION
1 : 100 @A1



2 BUILDING J - SOUTH ELEVATION
1 : 100 @A1

Key Plan:



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Rev Amendment By Chk* Date

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Project PAD30519

Orange Grove Public School

Perry St, Lilyfield NSW 2040

Title

20 - ELEVATIONS

ELEVATIONS - BUILDING J - SOUTH, WEST

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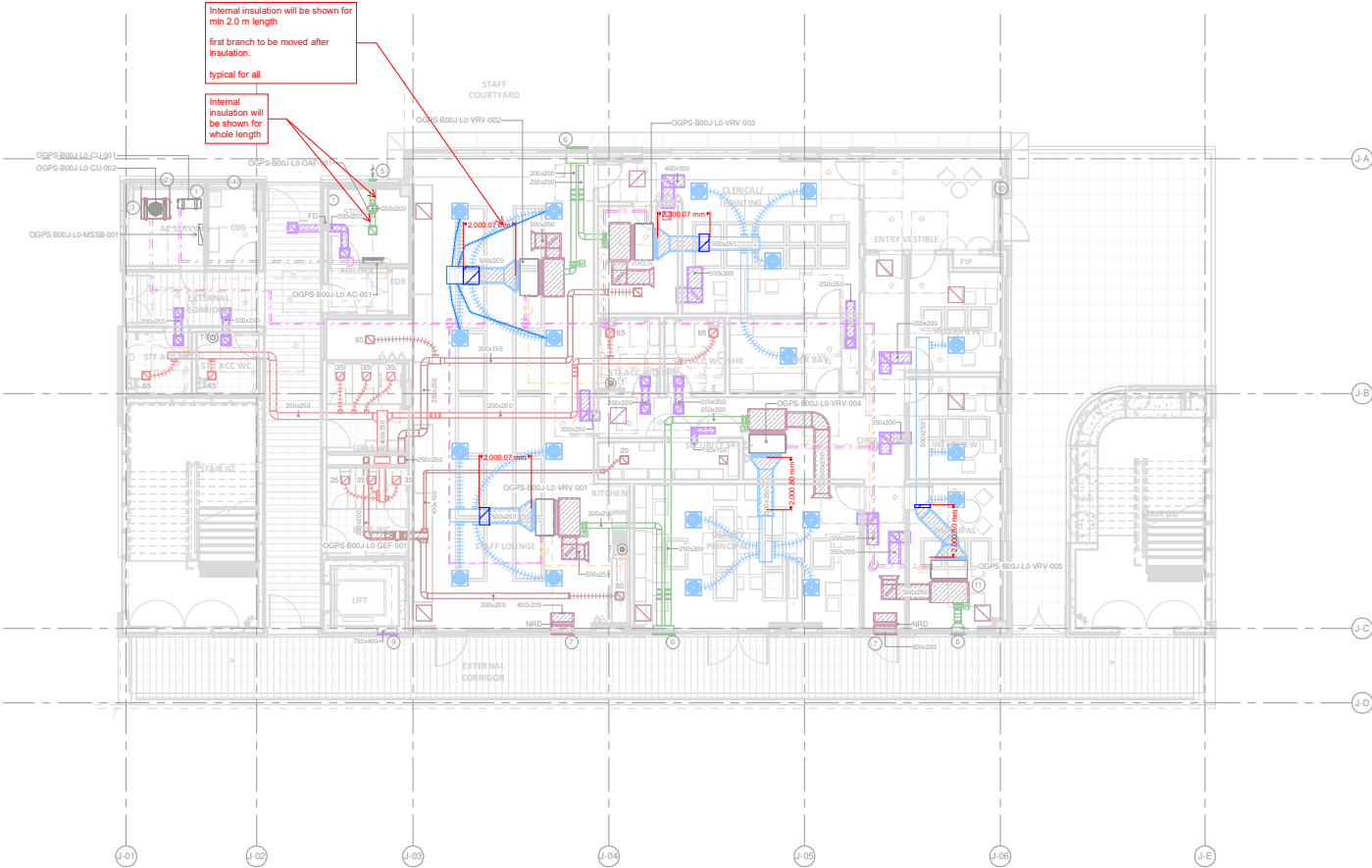
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Status

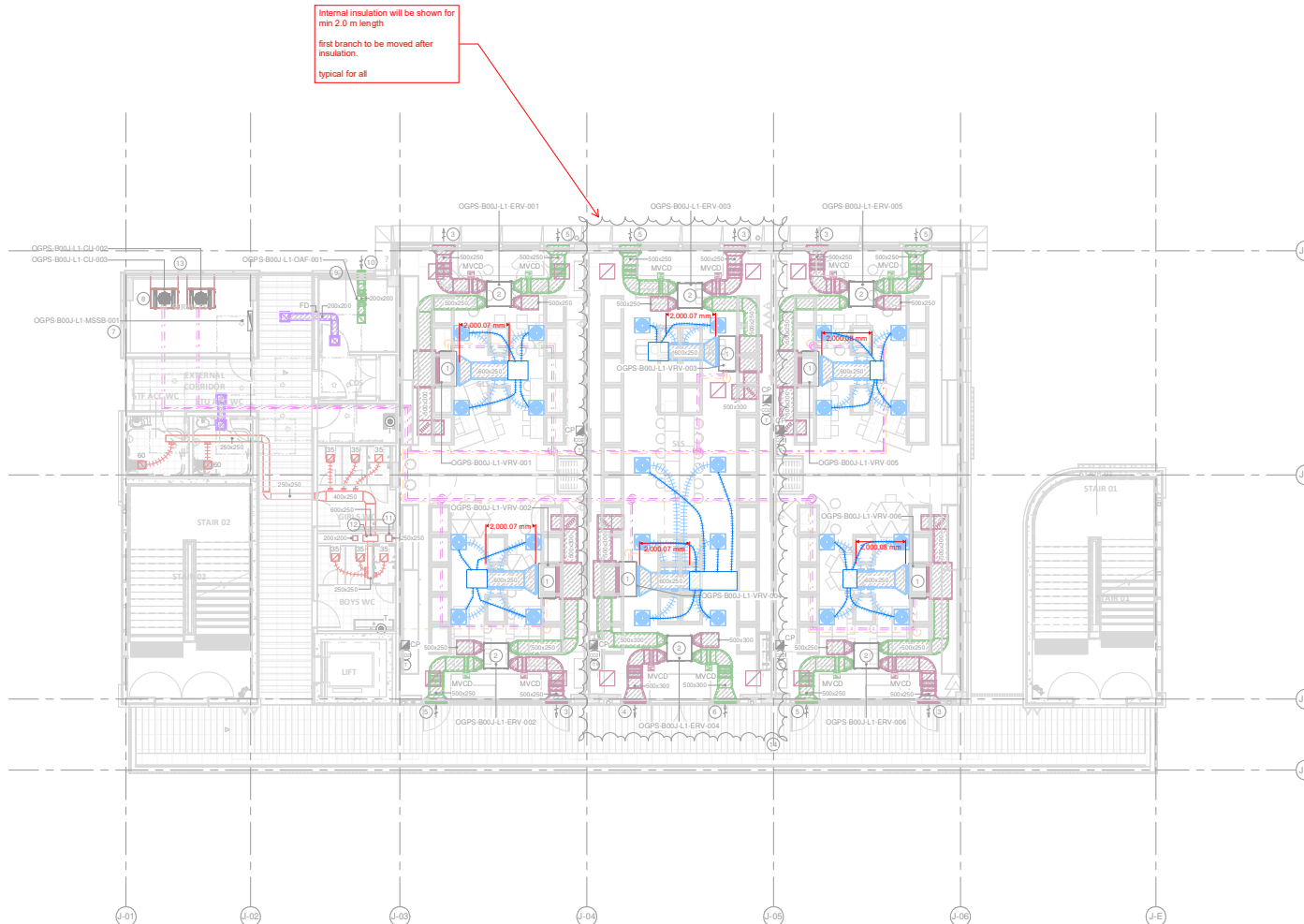
REF SUBMISSION

No.	DESCRIPTION
1	SIDE-DISCHARGE SPLIT CONDENSER UNIT ASSOCIATED WITH BCR ROOM, MOUNTED AT HIGH LEVEL.
2	LOUVRE OPENING ANGLED AT 20 DEGREES FROM HORIZONTAL. WHERE NOT USED FOR HOT AIR DISCHARGE PURPOSES, LOUVRE TO BE BLANKED OFF TO PREVENT SHORT CIRCUIT OF HOT AIR INTO THE PLANTROOM
3	VRF CONDENSER OUTDOOR UNIT WITH HIGH STATIC PRESSURE. REMOVE OUTDOOR UNIT DISCHARGE GRILL AND INSTALL SIDE DISCHARGE DUCT, DUCT TO BE FIXED AGAINST THE LOUVRE ALLOW MIN 100 MM IN BETWEEN CONDENSER UNITS 1700Hx1000x800 EACH
4	CLEANER STORE TO BE NATURALLY VENTILATED PROVIDE OPENING AT MIN 6.25% OF THE TOTAL FLOOR AREA
5	250x250 WEATHERPROOF LOUVRE ON WALL COMPLETE WITH PLENUM AND G4 FILTER
6	800x200 WEATHERPROOF LOUVRE ON WALL COMPLETE WITH PLENUM.
7	800x200 WEATHERPROOF LOUVRE ON WALL COMPLETE WITH PLENUM AND NON-RETURN AIR DAMPER FOR AIR RELIEF
8	500x200 WEATHERPROOF LOUVRE ON WALL COMPLETE WITH PLENUM.
9	750x400 WEATHERPROOF LOUVRE ON WALL
10	ENTRY VESTIBULE TO BE NATURALLY VENTILATED, ARCHITECT TO PROVIDE PERMANENT OPENING AT MIN 6.25% OF THE TOTAL FLOOR AREA
11	IN-CEILING DUCTED FAN COIL UNIT WITH MIN 800 LONG MIXING AIR PLENUM AND F5 FILTER. PROVIDE MOTORISED DAMPER ON OUTSIDE AIR CONNECTION. ALLOW FOR CONDENSATE PUMP FOR UNITS WHERE ADEQUATE FALLS CANNOT BE ACHIEVED. TYPICAL FOR ALL.



- GENERAL NOTES
- MECHANICAL CONTRACTOR SHALL ATTEND SITE PRIOR TO ANY WORKS.
 - IN CEILING EQUIPMENT LOCATION AND ROUTING ARE ESTIMATED AND FOR REFERENCE ONLY. SUBJECT TO FURTHER SITE COORDINATION BY MECHANICAL CONTRACTOR
 - ALL LOUVRE SHALL BE VERMIN PROOF

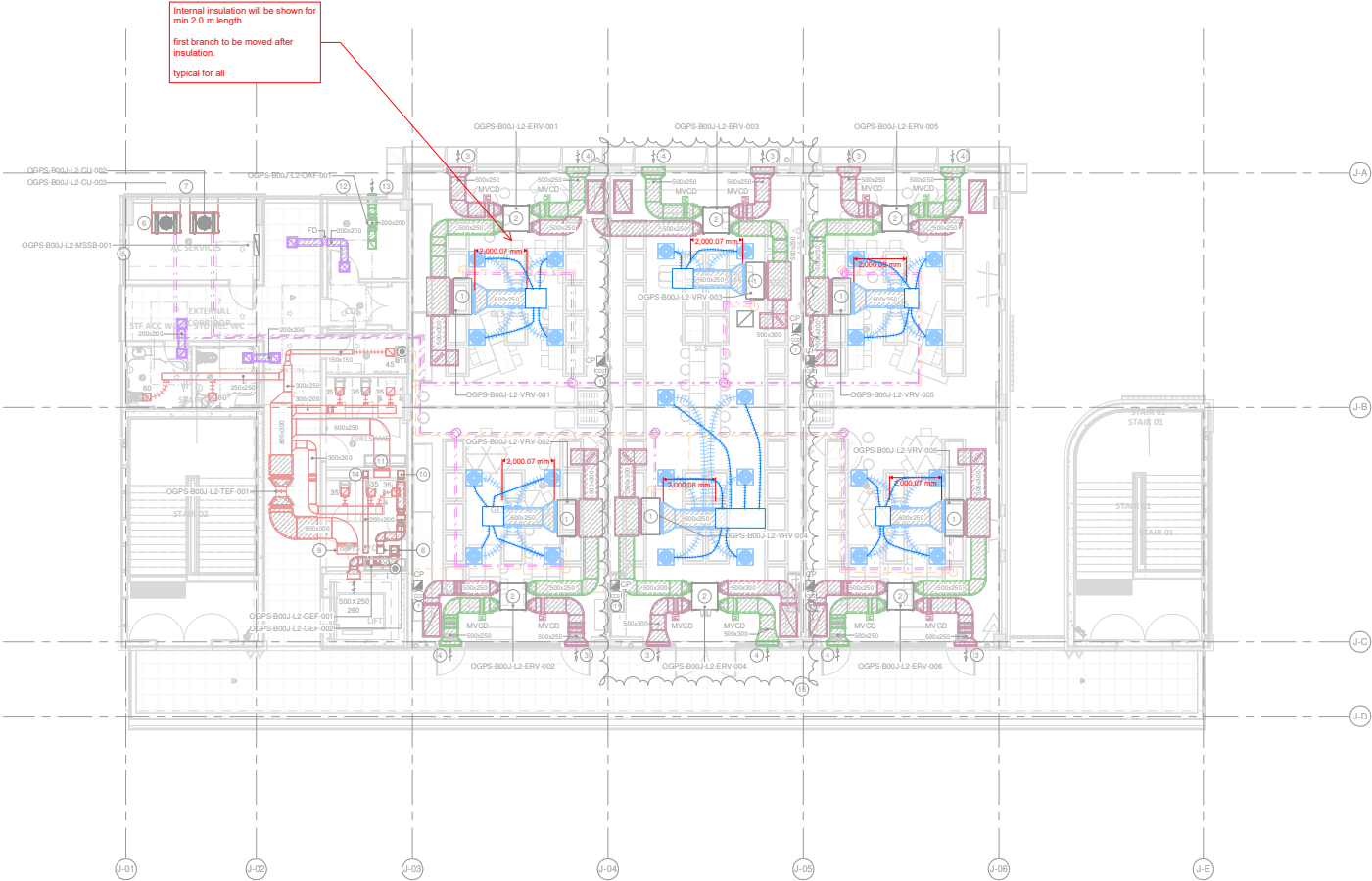
No.	DESCRIPTION
1	DUCTED FAN COIL UNIT COMPLETE WITH 800 MM LONG INTERNALLY INSULATED MIXING AIR PLENUM AND F5 FILTER. PROVIDE VOLUME CONTROL DAMPER ON INTERNALLY INSULATED RETURN AIR DUCTWORK AND MOTORIZED VOLUME CONTROL DAMPER ON OUTSIDE AIR DUCTWORK
2	ENERGY RECOVERY UNIT, 500 MM HIGH, ALLOW CLEARANCE AROUND UNIT AS REQUIRED BY MANUFACTURER
3	800/300 WEATHERPROOF RELIEF AIR LOUVER AND PLENUM
4	MIN 800x400 WEATHERPROOF RELIEF AIR LOUVER AND PLENUM
5	800/300 WEATHERPROOF OUTSIDE AIR LOUVER AND PLENUM
6	MIN 800x400 WEATHERPROOF OUTSIDE AIR LOUVER AND PLENUM
7	LOUVER OPENING ANGLED AT 20 DEGREES FROM HORIZONTAL FOR VENTILATION INTAKE TO THE CONDENSER UNITS
8	VRF CONDENSER OUTDOOR UNIT WITH HIGH STATIC PRESSURE. REMOVE OUTDOOR UNIT DISCHARGE GRILL AND INSTALL DISCHARGE DUCT, DUCT TO BE FIXED AGAINST THE LOUVER ALLOW MIN 100 MM IN BETWEEN CONDENSER UNITS 1700Wx1000x800 EACH
9	CLEANER STORE TO BE NATURALLY VENTILATED. DOOR GRILLE TO BE PROVIDED TO EASE THE ODOR GENERATION WITHIN THE ROOM
10	250/250 WEATHERPROOF LOUVER ON WALL COMPLETE WITH PLENUM AND G4 FILTER
11	250/250 GENERAL EXHAUST RISER TO BELOW
12	600x250 TOILET EXHAUST RISER TO BELOW
13	LOUVER OPENING ANGLED AT 20 DEGREES FROM HORIZONTAL. WHERE NOT USED FOR HOT AIR DISCHARGE PURPOSES, LOUVER TO BE BLANKED OFF TO PREVENT SHORT CIRCUIT OF HOT AIR INTO THE PLANTROOM
14	PENDING MULTI-PURPOSE ROOM COORDINATION



- GENERAL NOTES**
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No. DESCRIPTION

- 1 DUCTED FAN COIL UNIT COMPLETE WITH 800 MM LONG INTERNALLY INSULATED MIXING AIR PLENUM AND F5 FILTER. PROVIDE VOLUME CONTROL DAMPER ON INTERNALLY INSULATED RETURN AIR DUCTWORK AND MOTORISED VOLUME CONTROL DAMPER ON OUTSIDE AIR DUCTWORK
- 2 ENERGY RECOVERY UNIT. 500 MM HIGH. ALLOW CLEARANCE AROUND UNIT AS REQUIRED BY MANUFACTURER
- 3 800x300 WEATHERPROOF RELIEF AIR LOUVRE AND PLENUM
- 4 800x300 WEATHERPROOF OUTSIDE AIR LOUVRE AND PLENUM
- 5 LOUVRE OPENING ANGLED AT 20 DEGREES FROM HORIZONTAL FOR VENTILATION INTAKE TO THE CONDENSER UNITS
- 6 VRF CONDENSER OUTDOOR UNIT WITH HIGH STATIC PRESSURE. REMOVE OUTDOOR UNIT DISCHARGE GRILL AND INSTALL SIDE DISCHARGE DUCT. DUCT TO BE FIXED AGAINST THE LOUVRE ALLOW MIN 100 MM IN BETWEEN CONDENSER UNITS 1700x1000x800 EACH
- 7 LOUVRE OPENING ANGLED AT 20 DEGREES FROM HORIZONTAL. WHERE NOT USED FOR HOT AIR DISCHARGE PURPOSES, LOUVRE TO BE BLANKED OFF TO PREVENT SHORT CIRCUIT OF HOT AIR INTO THE PLANTROOM
- 8 250x250 GENERAL EXHAUST AIR RISER TO ABOVE. COMPLETE WITH ROOF COWL AND WIRE MESH. ROOF COWL SIZED FOR MAX 2.5 M/S DISCHARGE
- 9 800x300 TOILET EXHAUST AIR RISER TO ABOVE. COMPLETE WITH ROOF COWL AND WIRE MESH. ROOF COWL SIZED FOR MAX 2.5 M/S DISCHARGE
- 10 250x250 GENERAL EXHAUST RISER TO BELOW
- 11 600x250 TOILET EXHAUST RISER TO BELOW
- 12 CLEANER STORE TO BE NATURALLY VENTILATED. DOOR GRILLE TO BE PROVIDED TO EASE THE ODOR GENERATION WITHIN THE ROOM
- 13 250x250 WEATHERPROOF LOUVRE ON WALL COMPLETE WITH PLENUM AND G4 FILTER
- 14 200x200 GENERAL EXHAUST RISER FROM BELOW
- 15 PENDING MULTI-PURPOSE ROOM COORDINATION



- GENERAL NOTES
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 - IN CEILING EQUIPMENT LOCATION AND ROUTING ARE ESTIMATED AND FOR REFERENCE ONLY. SUBJECT TO FURTHER SITE COORDINATION BY MECHANICAL CONTRACTOR
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No.	DESCRIPTION
1	ROOF COWLS COMPLETE WITH BIRD WIRE MESH. LOCATION FOR REFERENCE ONLY, COORDINATE FINAL LOCATION ON SITE

