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3 Darling Point Road, Darling Point (Ranelagh Apartments)

DA Acoustic Assessment

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| Project ID | 20191387.2 |
|----------------|------------------------|
| Document Title | DA Acoustic Assessment |
| Attention To | Mille Projects Pty Ltd |

| Revision | Date | Document Reference | Prepared By | Checked By | Approved By |
|----------|------------|-------------------------|----------------|---------------|----------------|
| 0 | 26/02/2021 | 20191387.2/2602A/R0/KNM | KNM | | GW |
| 1 | 1/03/2021 | 20191387.2/0103A/R1/KNM | GW | | GW |
| | | | | | |

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1 INTRODUCTION

Acoustic Logic has been engaged to conduct an acoustic assessment of potential noise impacts associated with the proposed alteration and addition to the existing residential tower at 3 Darling Point Road, Darling Point (also known as Ranelagh Apartments).

This report addresses noise impacts associated with the following:

- Traffic noise intrusion for the change of facade.
- Noise emissions from mechanical plant.
- BCA requirements for Class 2 buildings.

The following documents and guidelines have been utilised in this assessment:

- Woollahra Municipal Council's Woollahra Development Control Plan 2015.
- NSW Environmental Protection Authority's (EPA) Noise Policy for Industry (NPfl) 2017.
- NSW Department of Planning's State Environmental Planning Policy (Infrastructure) 2007.
- NSW Department of Planning's Developments Near Rail Corridors or Busy Roads Interim Guideline.
- National Construction Code's Building Code of Australia 2019.

This assessment has been conducted using the architectural drawings prepared by Scott Carver (dated 12/02/2021, Revision 1).

2 SITE DESCRIPTION

The existing development, located at 3 Darling Point Road, Darling Point is a 31-storey residential tower, including 1 level of basement carpark. This development application seeks to modernise the façade of the tower by replacing the façade structure and add a single-dwelling penthouse on Level 31, bringing the tower to a total of 32-storeys.

Based on our site survey, the surrounding sensitive noise receivers include the following:

- Receiver 1 Residential properties situated south of the site.
- Receiver 2 Residential properties situated west of the site, across Darling Point Road
- Receiver 3 Residential properties situated north of the site.
- Receiver 4 Residential properties situated east of the site.

A site map, measurement description and surrounding receivers are presented in Figure 1 below.



Figure 1 – Site Survey (source: SIX Maps NSW)



Project Building

Residential Receiver



Unattended Noise Monitor

Attended Measurement

3 EXISTING ACOUSTIC ENVIRONMENT

Acoustic monitoring was conducted near the site to establish the background noise levels which will be used as basis for this assessment.

3.1 ENVIRONMENTAL NOISE DESCRIPTORS

Environmental noise constantly varies. Accordingly, it is not possible to accurately determine prevailing environmental noise conditions by measuring a single, instantaneous noise level.

To accurately determine the environmental noise a 15-minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In analysing environmental noise, three-principal measurement parameters are used, namely L₁₀, L₉₀ and L_{eq}.

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L₁₀ parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the 15-minute period. L_{eq} is important in the assessment of environmental noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

The L_{max} parameter represents the highest sound pressure level during a measurement period.

3.2 BACKGROUND NOISE LEVELS

Background noise levels which will be used as a basis for this assessment are detailed in the following sections.

3.2.1 Measurement Equipment

Background noise monitoring was undertaken with Acoustic Research Laboratories Pty Ltd noise monitors. The loggers were programmed to store 15-minute statistical noise levels throughout the monitoring period. The equipment was calibrated at the beginning and the end of each measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode.

3.2.2 Measurement Location

Please see Figure 1 for layout of monitoring locations, which are summarised below:

- Unattended Noise Logger located on outdoor carpark with 180° view of New South Head Road (see Figure 2 below).
- Unattended Noise Logger located on level 4 apartment balcony capturing traffic noise from New South Head Road and Darling Point Road (see Figure 3 below).
- Unattended Noise Logger located in the rear of the subject site, this monitor was aimed at capturing a background noise level as well as the drop off of traffic noise to the northern façade of the project site (see Figure 4 below).



Figure 2 – Monitor at Outdoor Carpark



Figure 3 – Monitor at Level 4 Apartment Balcony



Figure 4 – Monitor at Rear of Site

3.2.3 Measurement Period

Unattended noise monitoring periods for each monitor are as follows:

- 'Outdoor Carpark' monitor = from 01/12/2019 to 03/12/2019
- 'Level 4 Apartment Balcony' = from 01/12/2019 to 05/12/2019
- 'Rear of Site' monitors = from 01/12/2019 to 05/12/2019

3.2.4 Measured Background Noise Levels

NSW EPA's RBL assessment procedure requires determination of background noise level for each day (the ABL) then the median of the individual days as set out for the entire monitoring period.

Appendix A provides detailed results of the unattended noise monitoring. Adverse weather affected data was excluded from the assessment. The processed Rating Background Noise Levels (lowest 10th percentile noise levels during operation time period) are presented in the table below.

Table 1 - Measured Rating Background Noise Level

| | Rating Background Noise Level dB(A)L _{90(Period)} | | |
|--|---|-----------------------------|--------------------------------|
| Monitor Location | Daytime (7:00am-6:00pm) | Evening (6:00pm-10:00pm) | Night-Time (10:00pm-7:00am) |
| Outdoor Carpark (See Figure 2) | 55 | 52 | 43 |
| L4 Apartment Balcony (See Figure 3) | 55 | 52 | 44 |
| Rear of Site (See Figure 4) | 45 | 45 | 38 |

4 EXTERNAL NOISE INTRUSION ASSESSMENT

Site investigation indicates that the main external noise source around project site is traffic noise from Darling Point Road and New South Head Road. Noise intrusion from this source will be assessed in accordance with criteria nominated in Section 4.1 below.

4.1 CRITERIA

A noise intrusion assessment has been conducted based off the requirements of the following acoustic noise criteria/standards:

- Woollahra Municipal Council's Woollahra Development Control Plan 2015.
- NSW Department of Planning's State Environmental Planning Policy (Infrastructure) 2007.
- NSW Department of Planning's Developments Near Rail Corridors or Busy Roads Interim Guideline.

4.1.1 Woollahra Development Control Plan 2015.

Woollahra Municipal Council's *Woollahra Development Control Plan 2015* does not stipulate specific acoustic requirements in relation to internal noise levels for residential developments.

4.1.2 State Environmental Planning Policy (Infrastructure) 2007

Clause 102 of *SEPP (Infrastructure) 2007* is applied to residential accommodation developments adjacent to road corridors containing annual average daily traffic (AADT) volumes of more than 20,000 vehicles. According to Map 16 of the traffic volume maps for the Infrastructure SEPP prepared by the RTA, New South Head Road is classified as containing over 40,000 vehicles AADT and hence mandatory under clause 102.

The NSW Department of Planning's *Development Near Rail Corridors and Busy Roads – Interim Guideline*, sets out internal noise level criteria adapted from the State Environmental Planning Policy (Infrastructure) 2007 (the 'Infrastructure SEPP') for developments with the potential to be impacted by traffic or rail noise and vibration.

Clause 102 states the following:

(3) If the development is for the purposes of residential accommodation, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:

(a) in any bedroom in the residential accommodation—35 dB(A) at any time between 10 pm and 7 am,

(b) anywhere else in the residential accommodation (other than a garage, kitchen, bathroom or hallway)— 40 dB(A) at any time.

4.1.3 Development near Rail Corridors or Busy Roads – Interim Guideline

Section 3.5 of the NSW Department of Planning's *Development near Rail Corridors and Busy Roads (Interim Guideline)* states:

The following provides an overall summary of the assessment procedure to meet the requirements of clauses 87 and 102 of the Infrastructure SEPP. The procedure covers noise at developments for both Road and Rail.

- If the development is for the purpose of a building for residential use, the consent authority must be satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:
 - in any bedroom in the building: 35dB(A) at any time 10pm-7am
 - anywhere else in the building (other than a garage, kitchen, bathroom or hallway): 40dB(A) at any time.

4.1.4 Summarised Internal Noise Criteria

Based on the above, the internal noise criteria for each space are summarised below.

Table 2 – Summarised Internal Noise Criteria

| Space /Activity Type | Internal Noise Criteria |
|----------------------|---------------------------------|
| Sleeping Areas | 35 dB(A)L _{eq(9hour)} |
| Living Areas | 40 dB(A)L _{eq(15hour)} |

4.2 EXTERNAL NOISE MEASUREMENTS

This section of the report details noise measurements conducted at the site to establish external environmental noise levels impacting the development.

4.2.1 Measurement Equipment

4.2.1.1 Attended Measurements

Attended measurements were taken using a Norsonic-140 precision sound level analyser, set to A-weighted fast response. The sound level meter was calibrated before and after the measurements using a Rion NC73 precision sound calibrator and no significant drift was recorded.

4.2.1.2 Unattended Measurements

Unattended measurements were taken with Acoustic Research Laboratories Pty Ltd noise monitors. The loggers were programmed to store 15-minute statistical noise levels throughout the monitoring period. The equipment was calibrated at the beginning and the end of each measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode.

4.2.2 Measurement Location

Please see Figure 1 for layout of monitoring locations, which are summarised below:

4.2.2.1 Attended Measurements

- Attended Noise measurements on Level 4 Balcony (capturing traffic noise from New South Head Road and Darling Point Road).
- Attended Noise measurements on Level 14 Balcony (capturing traffic noise from New South Head Road and Darling Point Road).
- Attended Noise measurements on Level 30 Penthouse Balcony (capturing traffic noise from New South Head Road and Darling Point Road).
- Attended Noise measurements on Darling Point Road (Capturing traffic noise from Darling Point Road).
- Attended Noise measurements on New South Head Road (Capturing traffic noise from New South Head Road).

4.2.2.2 Unattended Measurements

- Unattended Noise Logger located on outdoor carpark with 180° view of New South Head Road (see Figure 2).
- Unattended Noise Logger located on level 4 apartment balcony capturing traffic noise from New South Head Road and Darling Point Road (see Figure 3).
- Unattended Noise Logger located in the rear of the subject site, this monitor was aimed at capturing a background noise level as well as the drop off of traffic noise to the northern façade of the project site (see Figure 4).

4.2.3 Measurement Period

4.2.3.1 Attended Measurements

Attended noise measurements were conducted on 05/12/2019 between 7:30am and 8:30am (morning peak hour) to supplement the unattended noise logging data.

4.2.3.2 Unattended Measurements

Unattended noise monitoring periods for each monitor are as follows:

- 'Outdoor Carpark' monitor = from 01/12/2019 to 03/12/2019
- 'Level 4 Apartment Balcony' = from 01/12/2019 to 05/12/2019
- 'Rear of Site' monitors = from 01/12/2019 to 05/12/2019

4.2.4 Measured Traffic Noise Levels

Results of the attended and unattended noise measurements have been summarised below for all locations.

4.2.4.1 Attended Measurements

| Measurement Location | Captured Noise | Measured Noise Level dB(A)L _{eq(15minute)} |
|-----------------------|------------------------------|--|
| Apartment 4a Balcony | Traffic Noise | 62 |
| Apartment 14b Balcony | Traffic Noise and Rail Noise | 62 |
| Penthouse 30a Balcony | Traffic Noise and Rail Noise | 60 |
| Darling Point Road | Traffic Noise | 59 |
| New South Head Road | Traffic Noise | 76 |

Table 3 – Attended Measurements (Traffic Noise)

4.2.4.2 Unattended Noise Monitoring

Results of the unattended noise monitoring conducted inside the project site has been summarised below. Further detailed results can be found in Appendix A of this report.

Table 4 - Unattended Noise Monitoring (Traffic Noise)

| | Measured Traffic Noise Levels | | |
|--|---|---|--|
| Location | Daytime (7am-10pm) dB(A)L _{eq(15hour)} | Night-Time (10pm-7am) dB(A)L _{eq(9hour)} | |
| Outdoor Carpark (See Figure 2) | 62 | 57 | |
| L4 Apartment Balcony (See Figure 3) | 62 | 56 | |
| Rear of Site (See Figure 4) | 58 | 47 | |

4.2.5 Adopted Noise Levels

The following table presents the resultant noise levels at the proposed boundary of the development. The noise levels are based on both the attended and unattended noise measurement results detailed above.

Table 5 – Adopted Traffic Noise Levels

| Locations | Traffic Noise Levels | | |
|-----------------------|-------------------------------------|-------------------------------------|--|
| | Daytime (7am-10pm) | Night time (10pm-7am) | |
| Southern Boundary | 63dB(A)L _{eq(24hr)} -SEPP | 63dB(A)L _{eq(24hr)} -SEPP | |
| (New South Head Road) | 65dB(A)L _{eq(1hr)} -AS2017 | 60dB(A)L _{eq(1hr)} -AS2017 | |
| Western Boundary | 63dB(A)L _{eq(24hr)} -SEPP | 63dB(A)L _{eq(24hr)} -SEPP | |
| (Darling Point Road) | 62dB(A)L _{eq(1hr)} -AS2017 | 60dB(A)L _{eq(1hr)} -AS2017 | |

4.3 SOUNDPLAN NOISE MODELLING

Traffic noise intrusion into the proposed development has been assessed using the measured external noise levels reported above as a basis.

Calculations were performed taking into account the orientation of windows, the total area of glazing, facade transmission loss and room sound absorption characteristics. In this way the likely interior noise levels can be predicted. Acoustic treatment required to ensure compliance with the assessment criteria are detailed in this section.

3D sound spectral modelling was conducted using sound plan modelling software (presented in the Appendix A).

Internal noise levels will primarily be as a result of noise transfer through the windows and doors as these are relatively light building elements that offer less resistance to the transmission of sound. Noise transfer through masonry construction will not be significant and no further acoustic treatment is required.

4.4 RECOMMENDED CONSTRUCTIONS

4.4.1 Glazed Windows and Doors

The recommended glazing constructions have been marked-up and presented in Appendix A.

Aluminium framed/sliding glass doors and windows will be satisfactory provided they meet the following criteria. All external windows and doors listed are required to be fitted with Q-Lon type acoustic seals. (**Note: Mohair Seals are not considered acoustic seals**).

Thicker glazing may be required for structural, safety or other purposes. Where it is required to use thicker glazing than scheduled, this will also be acoustically acceptable.

It is recommended that only window systems having test results indicating compliance with the required ratings obtained in a certified laboratory be used where windows with acoustic seals have been recommended.

In addition to complying with the minimum scheduled glazing thickness, the R_w rating of the glazing fitted into open-able frames and fixed into the building opening should not be lower than the values listed in Table 6 for all rooms. Where nominated, this will require the use of acoustic seals around the full perimeter of open-able frames and the frame will need to be sealed into the building opening using a flexible sealant.

4.4.1.1 Option 1 – Single Glazed System

Table 6 - Minimum R_W of Glazing (with Acoustic Seals)

| Glazing Assembly | Minimum R_w of Installed Window |
|-------------------|-----------------------------------|
| 12.38mm Laminated | 37 |
| 10.38mm Laminated | 35 |
| 6.38mm Laminated | 31 |

| Glazing Assembly | Equivalent IGU System |
|-------------------|---|
| 12.38mm Laminated | 10mm/ 12mm air gap /13.76mm laminated glazing |
| 10.38mm Laminated | 6mm glazing/ 12mm air gap/ 10.38mm laminated glazing |
| 6.38mm Laminated | 6.38mm laminated glazing/ 12mm air gap/ 6.38mm laminated glazing |

Table 7 - Minimum IGU Glazing System

4.4.2 Roof/Ceiling Construction

Roof construction of masonry systems (e.g. concrete slab) will be acoustically acceptable without additional treatment.

If any penetrations are required through any of the external lining of any of the systems above for other building services, all gaps should be filled with acoustic sealant to ensure compliance with internal noise level requirements.

4.4.3 External Wall Construction

External wall constructions of masonry systems (e.g. off-form concrete) will be acoustically acceptable without additional treatment.

If any penetrations are required through any of the external lining of any of the systems above for other building services, all gaps should be filled with acoustic sealant to ensure compliance with internal noise level requirements.

5 NOISE EMISSION ASSESSMENT

A noise emission assessment has been carried out to ensure noise emitted from the use of the site is in accordance with the requirements listed below.

5.1 CRITERIA

Noise emissions from the project site will be assessed against the requirements of the following:

- Woollahra Municipal Council's Woollahra Development Control Plan 2015.
- NSW Environmental Protection Authority's (EPA) Noise Policy for Industry (NPfl) 2017.

Detailed requirements from the documents above have been discussed below.

5.1.1 Woollahra Development Control Plan 2015.

Woollahra Municipal Council's *Woollahra Development Control Plan 2015* does not stipulate specific acoustic requirements in relation to internal noise levels for residential developments.

5.1.2 Noise Policy for Industry

The EPA NPfI provides guidelines for assessing noise impacts from developments. The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The NPfI has two requirements which must both be complied with, namely an amenity criterion and an intrusiveness criterion.

5.1.2.1 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor not exceed the background noise level by more than 5 dB(A).

Based on the noise monitoring locations relative to the surrounding receivers, the background noise levels at the 'rear of site' monitor has been adopted for Receivers 1, 3 and 4, while the background noise levels at the 'L4 apartment balcony' monitor has been adopted for Receiver 2.

| Receiver | Time of Day | Background Noise Level dB(A)L _{90(Period)} | Project Intrusiveness Noise Level dB(A)L _{eq(15minute)} |
|-----------------------------|-------------|---|--|
| Residential (R1, R3, R4) | Daytime | 45 | 50 |
| | Evening | 45 | 50 |
| | Night-Time | 38 | 43 |
| | Daytime | 55 | 60 |
| Residential (R2) | Evening | 52 | 57 |
| | Night-Time | 44 | 49 |

Table 8 - NPfl Intrusiveness Criteria

5.1.2.2 Amenity Criterion

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment (e.g. cumulative noise from project site and other developments).

The EPA's NPI sets out acceptable noise levels for different residential areas, being rural, suburban and urban. When determining types of residential receiver, the NPI considers the land zoning, existing noise levels and environmental noise characteristics of the area being assessed. Based on the measured noise levels and environmental noise characteristics, the 'Urban' classification is most appropriate and has been selected.

The NPI requires project amenity noise levels to be calculated in the following manner.

Project Amenity Noise Level $dB(A)L_{eq(15min)}$ = Recommended Amenity Noise Level - 5 dB(A) + 3 dB(A)

| Type of Receiver | Time of Day | Recommended Amenity Noise Level dB(A)L _{eq(15minute)} | Project Amenity Noise Level dB(A)L _{eq(15minute)} |
|---------------------|-------------|--|--|
| | Daytime | 60 | 58 |
| Residential (Urban) | Evening | 50 | 48 |
| | Night-Time | 45 | 43 |

Table 9 - NPfl Project Amenity Criteria

5.1.2.3 Summarised NPfl Criteria

Summary for noise emission criteria for all plant associated with the development has been summarised below.

Table 10 - Summary of Noise Emission Criteria (Plant Noise)

| Receiver | Time of Day | Project Intrusiveness Noise Level dB(A)L _{eq(15minute)} | Project Amenity Noise Level dB(A)L _{eq(15minute)} |
|-----------------------------|--------------------------------|--|--|
| Residential (R1, R3, R4) | Daytime (7:00am-6:00pm) | 50 | 58 |
| | Evening (6:00pm-10:00pm) | 50 | 48 |
| | Night-Time (10:00pm-7:00am) | 43 | 43 |
| Residential (R2) | Daytime (7:00am-6:00pm) | 60 | 58 |
| | Evening (6:00pm-10:00pm) | 57 | 48 |
| | Night-Time (10:00pm-7:00am) | 49 | 43 |

The established project noise trigger level is the lower (more stringent) value of the project intrusiveness and project amenity noise level. This has been bolded and shaded above.

5.2 MECHANICAL PLANT NOISE

Detailed plant selection has not been undertaken at this stage, as plant selections have not been determined. Detailed acoustic review should be undertaken at CC stage to determine acoustic treatments to control noise emissions to satisfactory levels. Satisfactory levels will be achievable through appropriate plant selection and location and, if necessary, standard acoustic treatments such as duct lining, acoustic silencers and enclosures.

Noise emissions from all mechanical services plant to the closest receivers are to comply with the noise emission criteria stipulated above.

6 BCA REQUIREMENTS

This section setup internal noise isolation criteria for new apartments added to the project buildings only. The requirements established in National Construction Code's *Building Code of Australia 2019*, which will need to be considered as part of the new residential addition on Level 31.

6.1 INTERTENANCY FLOORS

The intertenancy floor separating the new Sole Occupancy Unit (SOU) on Level 31 from SOU's on Level 30 will need to satisfy Clause F5.4(a)(i) of *Building Code of Australia 2019*.

Clause F5.4(a)(i) states the following:

- "(a) A floor in a Class 2 or 3 building must have an $R_w + C_{tr}$ (airborne) not less than 50 and an $L_{nT,w}$ (impact) not more than 62 if it separates -
 - *(i) sole-occupancy units;*

6.2 ENTRY DOORS

The apartment entry doors separating the new Sole Occupancy Unit (SOU) on Level 31 will need to satisfy Clause F5.5(b) of *Building Code of Australia 2019*.

Clause F5.5(b) states the following:

"(b) A door may be incorporated in a wall in a Class 2 or 3 building that separates a **sole-occupancy unit** from a stairway, **public corridor**, public lobby or the like, provided the door assembly has an R_w not less than 30."

6.3 HYDRAULIC SERVICES

Hydraulic services for the new Sole Occupancy Unit (SOU) on Level 31 will need to satisfy Clause F5.6(a) of *Building Code of Australia 2019.*

Clause F5.6(a) states the following:

"If a duct, soil, waste or water supply pipe, including a duct or pipe that is located in a wall or floor cavity, serves or passes through more than one **sole-occupancy unit**, the duct or pipe must be separated from the rooms of any **sole-occupancy unit** by construction with an $R_w + C_{tr}$ (airborne) not less than—

- (i) 40 if the adjacent room is a **habitable room** (other than a kitchen); or
- (ii) 25 if the adjacent room is a kitchen or non-habitable room."

7 CONCLUSION

This report presents an acoustic assessment of noise impacts associated with the proposed co-living development at 3 Darling Point Road, Darling Point (Ranelagh Apartments). Based on the information provided above, we conclude the following:

Provided that the recommendations set out in Section 4.4 of this report are employed, internal noise levels are able to satisfy requirements outlined in:

- Woollahra Municipal Council's Woollahra Development Control Plan 2015.
- NSW Department of Planning's State Environmental Planning Policy (Infrastructure) 2007.
- NSW Department of Planning's Developments Near Rail Corridors or Busy Roads Interim Guideline.

Detailed acoustic control measures for the mechanical plant servicing the proposed development are to be determined later during CC stage once the design and equipment selection have been finalised.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

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Acoustic Logic Consultancy Pty Ltd Kanin Mungkarndee

APPENDIX A – SOUNDPLAN MODEL



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APPENDIX B – GLAZING MARKUP

- 12.38mm Laminated Glazing
- or
- IGU System: 10mm /12mm air gap/13.76mm Laminated Glazing
- 10.38mm Laminated Glazing or
- IGU System: 6mm /12mm air gap /10.38mm Laminated Glazing
- 6.38mm Laminated Glazing or
 - IGU System: 6.38mm Laminated / 12mm air gap /6.38mm Laminated





[Ref] 20190074

[Dwg No] AD-DA112 [Rev] 1

- 12.38mm Laminated Glazing
- or
- IGU System: 10mm /12mm air gap/13.76mm Laminated Glazing
- 10.38mm Laminated Glazing or
- IGU System: 6mm /12mm air gap /10.38mm Laminated Glazing
- 6.38mm Laminated Glazing or
 - IGU System: 6.38mm Laminated / 12mm air gap /6.38mm Laminated



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Doug Southwell /7362

20190074-AB-DA001.rvt

[Nom. Architect]

[File]

[Print Date]

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History

EXISTING DEMOLISHED EXISTING RETAINED PROPOSED WORKS

EXISTING & PROPOSED - FLOOR PLAN LEVEL 2-11 [Ref] 20190074 [Dwg No] AD-DA113 [Rev] 1

- 12.38mm Laminated Glazing
- or
- IGU System: 10mm /12mm air gap/13.76mm Laminated Glazing
- 10.38mm Laminated Glazing or
- IGU System: 6mm /12mm air gap /10.38mm Laminated Glazing
- 6.38mm Laminated Glazing or
 - IGU System: 6.38mm Laminated / 12mm air gap /6.38mm Laminated

LEGEND

EXISTING DEMOLISHED EXISTING RETAINED PROPOSED WORKS

EXISTING & PROPOSED - FLOOR PLAN LEVEL 12-29

[Ref] 20190074

[Dwg No] AD-DA114 [Rev] 1

- 12.38mm Laminated Glazing
- or
- IGU System: 10mm /12mm air gap/13.76mm Laminated Glazing
- 10.38mm Laminated Glazing or
- IGU System: 6mm /12mm air gap /10.38mm Laminated Glazing
- 6.38mm Laminated Glazing or
 - IGU System: 6.38mm Laminated / 12mm air gap /6.38mm Laminated

- 12.38mm Laminated Glazing
- or
- IGU System: 10mm /12mm air gap/13.76mm Laminated Glazing
- 10.38mm Laminated Glazing or
- IGU System: 6mm /12mm air gap /10.38mm Laminated Glazing
- 6.38mm Laminated Glazing or
 - IGU System: 6.38mm Laminated / 12mm air gap /6.38mm Laminated

APPENDIX C – NOISE MONITORING DATA (OUTDOOR CARPARK)

APPENDIX D – NOISE MONITORING DATA (L4 APARTMENT BALCONY)

APPENDIX E - NOISE MONITORING DATA (REAR OF SITE)

