# 160 Great Western Highway, Mays Hill

# DA Acoustic Assessment

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## DOCUMENT CONTROL REGISTER

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# 1 INTRODUCTION

This report presents an acoustic assessment to accompany the development application for the proposed mixed use development at 160 Great Western Highway, Mays Hill.

In this report we have:

- Conducted an external noise intrusion assessment from traffic to determine the acoustic treatments required to achieve a reasonable level of amenity for future occupants.

- Conducted background noise monitoring to determine noise emission goals for future use of the development to meet the requirements of the NSW EPA Industrial Noise Policy and the Holroyd City Council.

This noise assessment is based on the following preliminary architectural drawings:

**Table 1 – Architectural Drawings Used for Assessment**

| ARCHITECT | Job Number | Drawing Number | Issue | Date |
|---|---|---|---|---|
| Zhinar Architects | 8349 | DA03 | A | 08/12/2014 |
| | | DA04 | | |
| | | DA05 | | |
| | | DA06 | | |
| | | DA07 | | |
| | | DA08 | | |
| | | DA09 | | |
| | | DA10 | | |
| | | DA11 | | |
| | | DA12 | | |

## 2 SITE DESCRIPTION / PROPOSED DEVELOPMENT

The site is located at 160 Great Western Highway, Mays Hill. The proposed development will be a mixed use development comprising of two separate towers. The southern tower, fronting Great Western Highway, will be a nine storey mixed use building with commercial tenancies on the second floor, residential apartments from the first floor upwards, and parking on the ground and basement levels.

The northern tower will be a three storey residential building with a basement car park.

The nearest major road to generate noise impacts on the project site is the Great Western Highway to the immediate south of the site, which carries high volumes of traffic.

Noise sensitive development in the vicinity of the site are as follows:

- Residential development to the immediate east of the site;
- Residential development to the immediate west of the site;
- Residential development to the immediate north of the site;
- Residential development to the south of the site across Great Western Highway.

Refer to Figure 1 below, which is an aerial photo of the existing site.


**Figure 1 – Site Map**

Noise Monitor Location

Attended Measurement Locations

# 3 NOISE DESCRIPTORS

Traffic noise constantly varies in level, due to fluctuations in traffic speed, vehicle types, road conditions and traffic densities. Accordingly, it is not possible to accurately determine prevailing traffic noise conditions by measuring a single, instantaneous noise level. To accurately determine the effects of traffic noise a 15-20 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. These parameters are used to measure how much annoyance would be caused by a particular noise source.

In the case of environmental noise, three principle measurement parameters are used, namely $L_{10}$, $L_{90}$ 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 interval.

The $L_{10}$ 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 measurement period. $L_{eq}$ is important in the assessment of traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of traffic noise.

Current practice favours the $L_{eq}$ parameter as a means of measuring traffic noise, whereas the $L_{10}$ parameter has been used in the past and is still incorporated in some codes. For the reasons outlined above, the $L_{90}$ parameter is not used to assess traffic noise intrusion.

# 4 TRAFFIC NOISE INTRUSION ASSESSMENT

The nearest major road to impact the amenity of the future occupants of the proposed development is the Great Western Highway to the immediate south of the project site.

## 4.1 ASSESSMENT OBJECTIVES

The determination of an acceptable level of noise within the residential spaces requires consideration of the activities carried out within the space and the degree to which noise will interfere with those activities.

As sleep is the activity most affected by environmental noise, bedrooms are the most sensitive rooms. Higher levels of noise are acceptable in living areas without interfering with activities such as reading, listening to television, etc. Noise levels in utility spaces such as kitchens, bathrooms, laundries, etc can be higher.

This development will be assessed against the requirements of the Holroyd City Council Development Control Plan (DCP), the SEPP (Infrastructure) 2007, and Australian Standard AS2107:2000.

### 4.1.1 Holroyd City Council DCP

Part B of the Holroyd City Council DCP states the following regarding external noise impacts on residential development:

*"**1.4 Privacy***

*C11. Where a property is adjacent to a railway or arterial road, an acoustic report conducted by a suitably qualified acoustic consultant is required to be submitted to Council. The acoustic report shall provide measurements of noise impacts upon proposed dwellings and make specific recommendations for the attenuation of noise to currently recognised levels conductive to reasonable residential amenity. Compliance with the maximum design sound levels recommended by the relevant Australian Standard. Recommended design sound levels and reverberation times for building interiors, as follows:*

- *Recreation areas- 40dB(A)*
- *Sleeping areas- 35dB(A)*
- *Other habitable rooms- 40dB(A)"*

### 4.1.2 SEPP (Infrastructure) 2007

Map No. 15 of the traffic volume maps for the Infrastructure SEPP on the RTA website (see below), classifies the Great Western Highway as a road where a noise intrusion assessment is mandatory under clause 102 of the State Environmental Planning Policy (SEPP Infrastructure) 2007. See SEPP map No. 15 and approximate location of the site below.

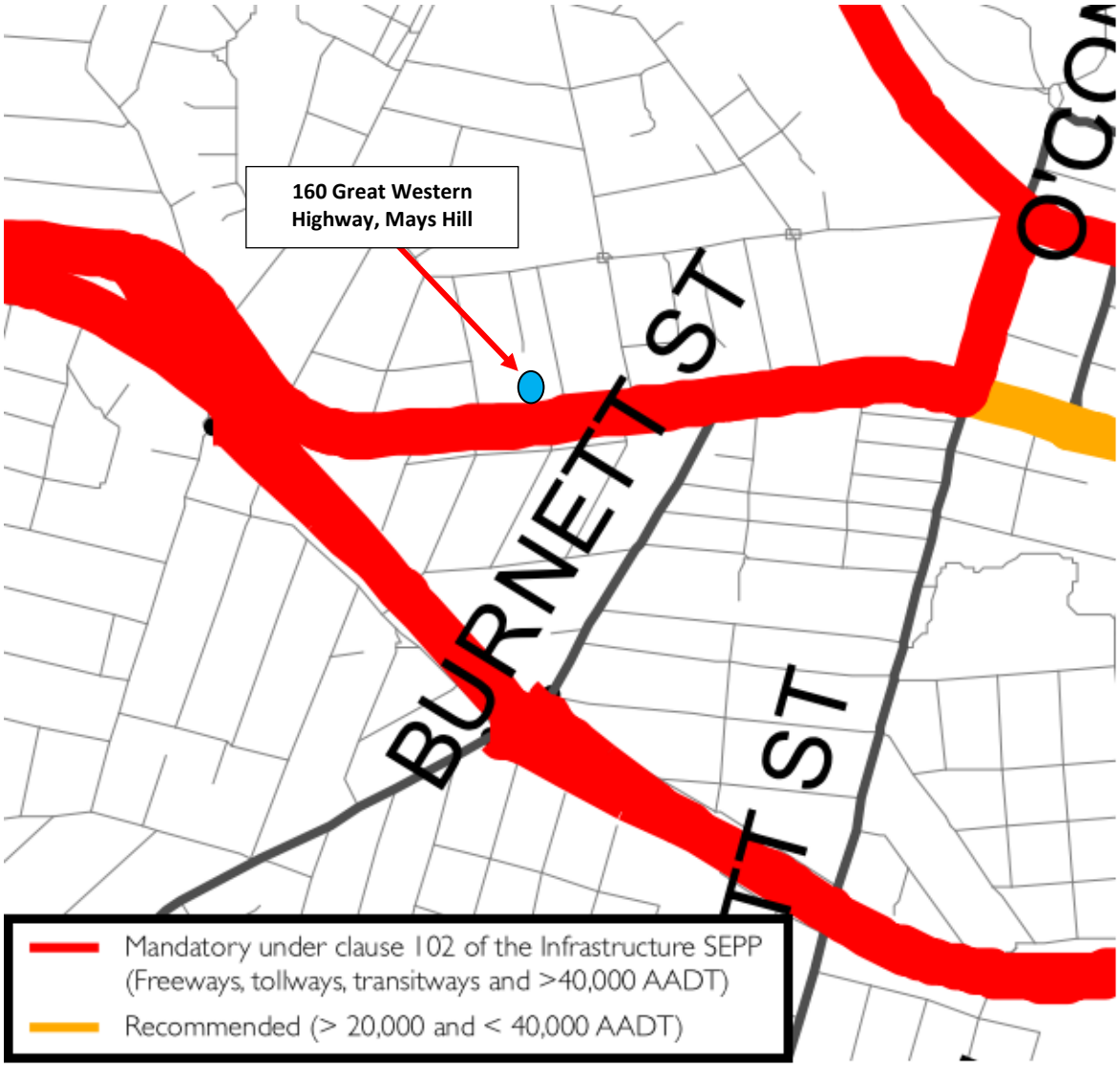



**Figure 2 – SEPP Map No. 15 and Approximate Location of Proposed Development**

Clause 102 of the SEPP (Infrastructure) 2007 stipulates the following:

*"This clause applies to development for any of the following purposes that is on land in or adjacent to the road corridor for a freeway, a tollway or a transit way or any other road with an annual average daily traffic volume of more than 40,000 vehicles (based on the traffic volume data published on the website of the RTA) and that the consent authority considers is likely to be adversely affected by road noise or vibration:*

*(a) a building for residential use,*

*If the development is for the purposes of a building for residential use, 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 $L_{Aeq}$ levels are not exceeded:*

*(a) in any bedroom in the building – 35 dB(A) at any time between 10 pm and 7am,*

*(b) anywhere else in the building (other than a garage, kitchen, bathroom or hallway) – 40 dB(A) at any time."*

### 4.1.3 Commercial

Acoustic treatments for commercial and retail spaces will be designed to achieve internal noise level of 45-50dB(A)$L_{eq}$ from traffic noise, which is the recommended noise level for retail spaces in AS2107:2000.

## 4.2 EXTERNAL NOISE MONITORING

### 4.2.1 Noise Monitoring

As part of this assessment, unattended noise monitoring and attended measurements were conducted in the vicinity of the project site to determine traffic noise levels from the nearest major roadways. The results of these measurements will be used to determine the treatments required to reduce noise levels to the internal spaces of the project site.

### 4.2.2 Measurement Locations

Attended noise measurements were conducted on the 27th November 2014 around the proposed development location between 8am and 9am. Measurements were undertaken using a Norsonics Type 140 precision sound level analyser, set to A-weighted fast response. The precision sound level analyser was calibrated before and after the measurements using a Norsonics 1251 sound level calibrator. No significant drift was recorded.

### 4.2.3 Unattended Noise Measurements

Unattended noise measurements were obtained using an Acoustic Research Laboratories Pty Ltd noise logger. The logger was programmed to store 15-minute statistical noise levels throughout the monitoring period. The noise monitor was calibrated at the beginning and the end of the measurement using a Rion NC-73 calibrator. No significant drift was detected. All measurements were taken on A-weighted fast response mode. There were no significant periods of adverse weather conditions during the measurement period. The logger was on site from the 20th to the 27th November 2014 (refer to figure 1 for location). Refer to Appendix 1 for the unmanned noise monitoring data of the site.

### 4.2.4 Measured Noise Levels

The following table presents the resultant noise levels at the proposed site location.

**Table 2 – Traffic Noise Levels at Proposed Site Location**

| Location | Period | Noise Level |
|---|---|---|
| Southern Façade (facing Great Western Highway Road) | Day (7am – 10pm) | 71dB(A) $L_{eq\ (15\ hour)}$ |
| | Night (10pm – 7am) | 67dB(A) $L_{eq\ (9\ hour)}$ |

## 4.3 RECOMMENDATIONS

External noise intrusions into the proposed development were assessed using the measured traffic 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.

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 the masonry elements will not be significant and need not be considered further.

The constructions necessary to achieve the noise levels are detailed below. The predicted noise levels have been based on the expected level and spectral characteristics of the external noise, the area of building elements exposed to traffic noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

### 4.3.1 Glazed Windows and Doors

The standard glazing recommendations for this project are presented in the glazing mark-ups in Appendix 2. These glazing recommendations will achieve the internal noise goals outlined in section 4.1. Aluminium framed/sliding glass doors and windows will be satisfactory provided they meet the following criteria listed below.

In addition to meeting the minimum glazing thickness requirements given, the design of the window mullions, perimeter seals and the installation of the windows/doors in the building openings shall not reduce the STC rating of the glazing assembly below the values nominated in the table below. Note that mohair type seals will not be acceptable for the windows requiring acoustic seals.

The window/door suppliers should provide evidence that the systems proposed have been tested in a registered laboratory with the recommended glass thicknesses and comply with the minimum listed STC requirements. Also, the glazing installer should certify that the window/doors have been constructed and installed in a manner equivalent to the tested samples.

**Table 3 – Minimum STC of Glazing (with Acoustic Seals)**

| Glazing Assembly | Minimum STC of Installed Window | Acoustic Seals |
|---|---|---|
| 5mm float | 28 | Yes |
| 6mm float | 29 | Yes |
| 6.38mm laminated | 31 | Yes |
| 10.38mm laminated | 35 | Yes |

### 4.3.2 External Walls

The proposed masonry wall construction for the development will be acoustically acceptable. There should not be vents on the internal skin of external walls. All penetrations to the internal skin of external walls should be acoustically sealed.

### 4.3.3 External Entry Doors

It is recommended that full perimeter acoustic seals are used for all living room and bedroom external entry doors on the eastern, western and southern facades of the development. Timber doors shall be a minimum of 40mm solid core timber with Raven RP10 to the top and sides, and Raven RP38 to the underside of the door.

Glazed doors shall have glazing thicknesses equal to those recommended in the Appendix 2 glazing mark-up, and are to have Raven RP10 to the top and sides, and Raven RP38 to the underside of the door.

### 4.3.4 Roof / Ceiling Construction

#### 4.3.4.1 Concrete Roof

Residential apartments with concrete construction will not require any extra treatment for acoustic purposes.

#### 4.3.4.2 Lightweight Roofs

The recommended roof/ceiling construction for units with metal deck roofing is shown below in Figure 2.

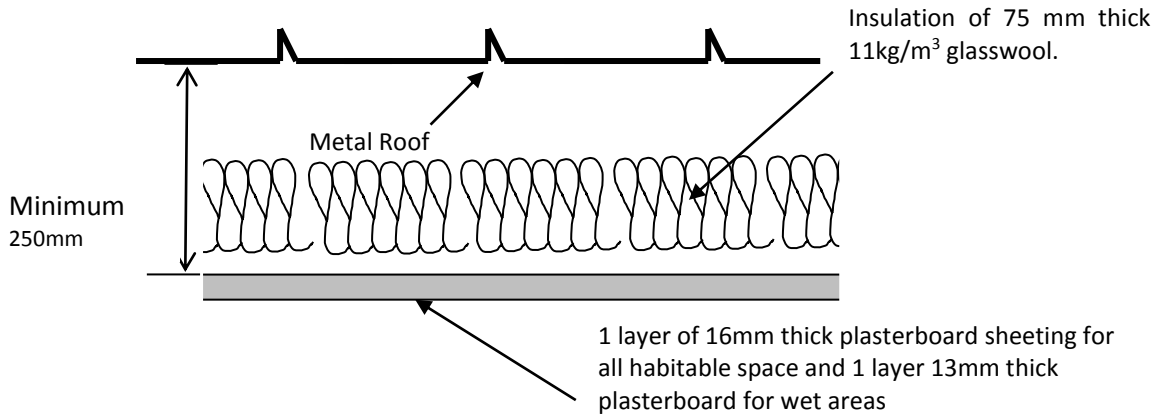



**Figure 2 - Roof / Ceiling Construction Below Light Weight Roof**

Penetrations in ceilings (such as for light fittings etc.) must be sealed gap free with a flexible sealant. Any ventilation openings in the ceilings would need to be acoustically treated to maintain the acoustic performance of the ceiling construction.

### 4.3.5 Ventilation Requirements

With respect to natural ventilation of the dwelling, the NSW Department of Planning document "Development near Busy Roads and Rail Corridors - Interim Guideline" dictates that:

- *"If internal noise levels with windows or doors open exceed the criteria by more than 10dB(A), the design of the ventilation for these rooms should be such that occupants can leave windows closed, if they so desire, and also to meet the ventilation requirements of the Building Code of Australia."*

With windows open, the allowable internal noise goal is permitted to be 10dB(A) higher than when the windows are closed (ie – allowable level in bedrooms becomes 45dB(A), and 50dB(A) in living rooms).

All habitable rooms with glazing only facing to the north will be able to achieve the internal noise goals with windows open.

All other habitable spaces within the development (that is, those with windows facing east, west or south) will require to have their windows closed in order to meet acoustic requirements. A mechanical engineer is to confirm if supplementary ventilation (to meet Australian Standard AS1668.2 requirements) will be required to these rooms.

# 5 NOISE EMISSION ASSESSMENT

Noise emissions from the site should be assessed to ensure that the amenity of nearby land users are not adversely affected.

Potential noise sources which should be assessed are:

- Noise generated by mechanical plant (typically air-conditioning).

The nearest potentially affected noise receivers are:

- Residential receivers to the north, east and west of the project site.

Noise emission criteria will be determined based on the following documents:

- NSW EPA Industrial Noise Policy
- Protection of Environmental Operation Act Regulation 2000
- Holroyd City Council DCP

## 5.1 BACKGROUND NOISE MONITORING

Background noise levels for the site were obtained using an unattended noise logger and attended measurements around the project site.

Attended noise measurements were conducted on the 27th November 2014 around the proposed development location between 8am and 9am. Measurements were undertaken using a Norsonics Type 140 precision sound level analyser, set to A-weighted fast response. The precision sound level analyser was calibrated before and after the measurements using a Norsonics 1251 sound level calibrator. No significant drift was recorded.

The unattended monitoring was conducted using an Acoustic Research Laboratory's noise logger. The logger was set to A-weighted fast response and was programmed to store 15-minute statistical noise levels throughout the monitoring period. The monitor was calibrated at the start and end of the monitoring period using a Rion NC-73 calibrator. No significant drift was noted.

The unattended measurement was conducted from the 20th to the 27th November 2014. Refer to the aerial photo in figure 1 for the noise monitor location and attended measurement locations.

The measured background noise levels are summarised in the table below.

**Table 5 - Measured Background Noise Levels**

| Description | Day Noise Level 7am to 6pm (dB(A)) | Evening Noise Level 6pm to 10pm (dB(A)) | Night Noise Level 10pm to 7am (dB(A)) |
|---|---|---|---|
| Minimum Repeatable Background $L_{90,15min}$ | 44 | 43 | 35 |

## 5.2 NOISE EMISSION OBJECTIVES

Noise emissions from the development will have to achieve the following requirements.

### 5.2.1 NSW EPA Industrial Noise Policy

The NSW EPA Industrial Noise Policy, has two criteria which need to be satisfied namely Intrusiveness and Amenity. These are described below:

- *Intrusiveness Criteria* - This 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). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

- *Amenity Criteria* - This guideline is intended to limit the absolute noise level from all "industrial" noise sources such as mechanical plant to a level that is consistent with the general environment.

The EPA's Industrial Noise Policy sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface.

Noise levels are to be assessed at the property boundary or nearby dwelling, or at the balcony or façade of an apartment.

#### 5.2.1.1 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 do not exceed the background noise level by more than 5dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

Background noise levels adopted are presented in Section 5.1. Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

**Table 6 – Intrusiveness Noise Emission Goals**

| Location | Period/Time | Intrusiveness Noise Emission Goal dB(A) $L_{eq(15min)}$ |
|---|---|---|
| Nearby Residences | Day (7am-6pm) | 49 |
| | Evening (6pm-10pm) | 43 |
| | Night (10pm-7am) | 40 |

#### 5.2.1.2 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.

The NSW EPA Industrial noise policy sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different areas. They are rural, suburban, urban and urban/industrial interface. This site is categorised by suburban receivers.

For the purposes of this condition:

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays;
- Evening is defined as the period from 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and public holidays.

**Table 7 – Amenity Noise Emission Goals**

| Location | Period/Time | Amenity Noise Emission Goal dB(A) $L_{eq(Period)}$ |
|---|---|---|
| Nearby Residences – Suburban Receiver | Day (7am-6pm) | 55 |
| | Evening(6pm-10pm) | 45 |
| | Night(10pm-7am) | 40 |

### 5.2.2 Protection of the Environmental Operation Act Regulation 2000

Protection of the Environmental Operations regulation limits the noise levels associated within the operation of domestic air conditioning criteria during night time periods which is presented below:

*Protection of the Environmental Operations (Noise Control) Regulation 2000-Sect 52*

*52 Air Conditioners*

*(1) A person must not cause or permit an air conditioner to be used on residential premises in such a manner that it emits noise that can be heard within a habitable room in any other residential premises (regardless of whether any door or window to that room is open):*

*(a) before 8 am or after 10 pm on any Saturday, Sunday or public holiday, or*
*(b) before 7 am or after 10 pm on any other day.*

### 5.2.3 Holroyd City Council DCP

Part B of the Holroyd City Council DCP states the following regarding noise emissions from mechanical plant for residential development:

*"**1.4 Privacy***

*C15. Air conditioners, swimming pool pumps and the like are not to exceed 5dB(A) above background noise levels and should not be audible from habitable rooms of neighbouring dwellings.*

*Note: Air conditioners, swimming pool pumps and the like shall comply with the Protection of the Environment Act and Noise Regulation.*

*C24. Any potential noise- generating motor, equipment or machinery system must be located so as to not cause a noise nuisance for neighbours. These items must be capable of being operated in accordance with the noise requirements of the Protection of the Environment Operations Act 1997."*

### 5.2.4 Resultant Project Noise Emission Criteria

Based on the requirements stated in the sections above, table 8 provides a summary of the assessment criteria applicable to the future residential development at the project site. The assessment criteria are also based on the background noise monitoring data conducted at the proposed development location.

**Table 8 – Environmental Noise Emission Criteria**

| Time Period | Assessment Background Noise Level dB(A)$L_{90}$ | Amenity Criteria dB(A) $L_{eq}$ | Intrusiveness Criteria Background + 5 dB(A) $L_{eq}$(15min) | EPA Criteria for Residential Condensers |
|---|---|---|---|---|
| Day | 44 | 55 | 49 | N/A |
| Evening | 43 | 45 | 48 | N/A |
| Night | 35 | 40 | 40 | Inaudible within neighbouring premises |

## 5.3 MECHANICAL PLANT

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 residential receiver should comply with the noise emission criteria in Section 5.2.4.

# 6 CONCLUSION

This report presents our acoustic assessment of the proposed mixed use development at 160 Great Western Highway, Mays Hill.

Noise intrusion from traffic onto the future occupants of the development have been assessed in accordance with the SEPP Infrastructure 2007, the Holroyd City DCP and Australian Standard AS2107:2000. Provided the acoustic treatments in Section 4 are adhered to, the internal noise levels will satisfy the requirements of the criteria.

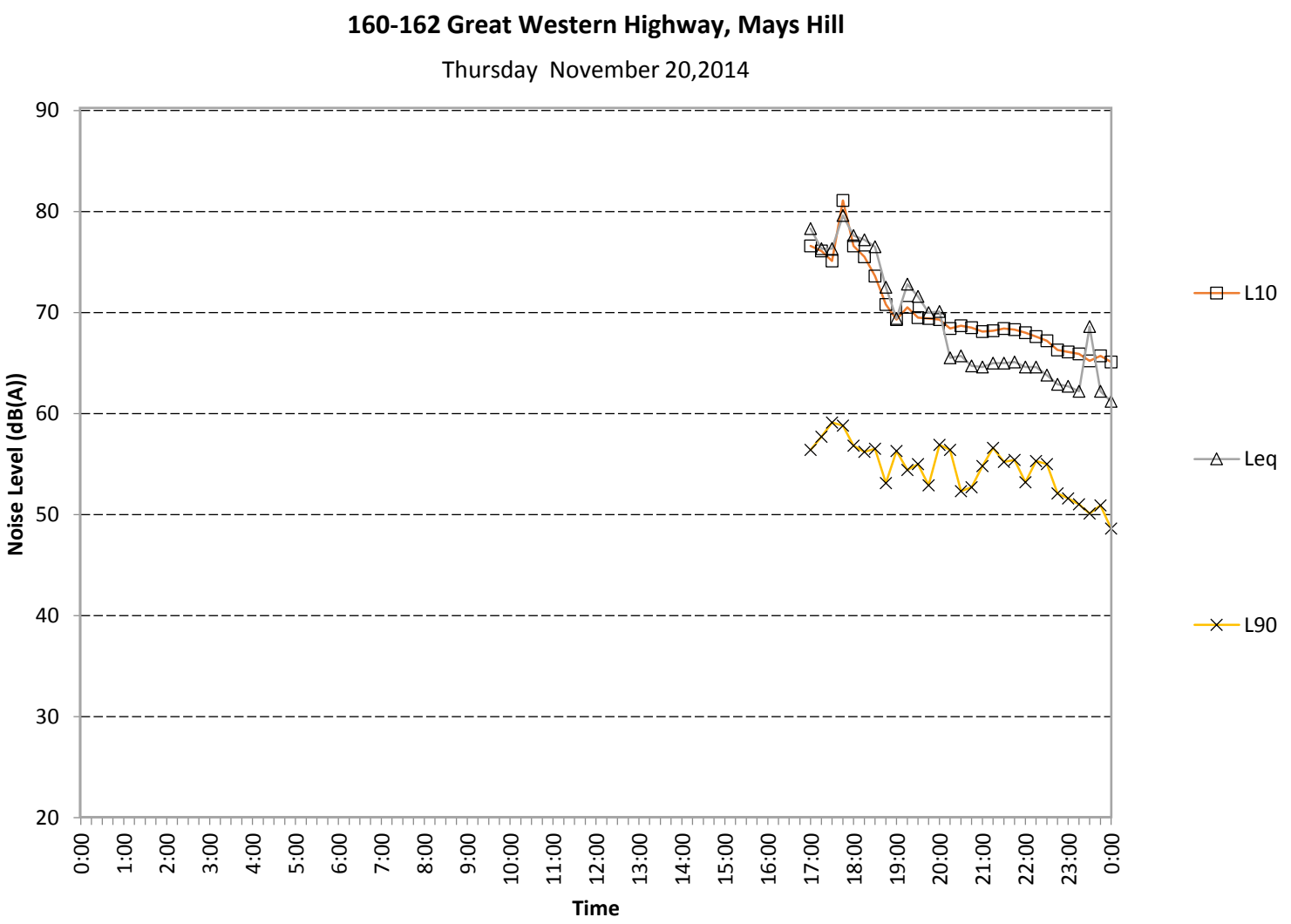
Noise emission criteria for the development site have been determined based on background noise logging data, the NSW EPA Industrial Noise Policy, the Protection of the Environment Operations Act Regulation 2000 and the Holroyd City Council. The resultant criteria are presented in Section 5.2.4. Noise from mechanical plant items associated with the proposed development should comply with these criteria. Detailed design of mechanical plant items should be carried out during the CC stage.

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

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Justin Leong

# APPENDIX 1: UNATTENDED NOISE MEASUREMENTS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Thursday November 20,2014
Noise Level (dB(A))
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80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
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11:00
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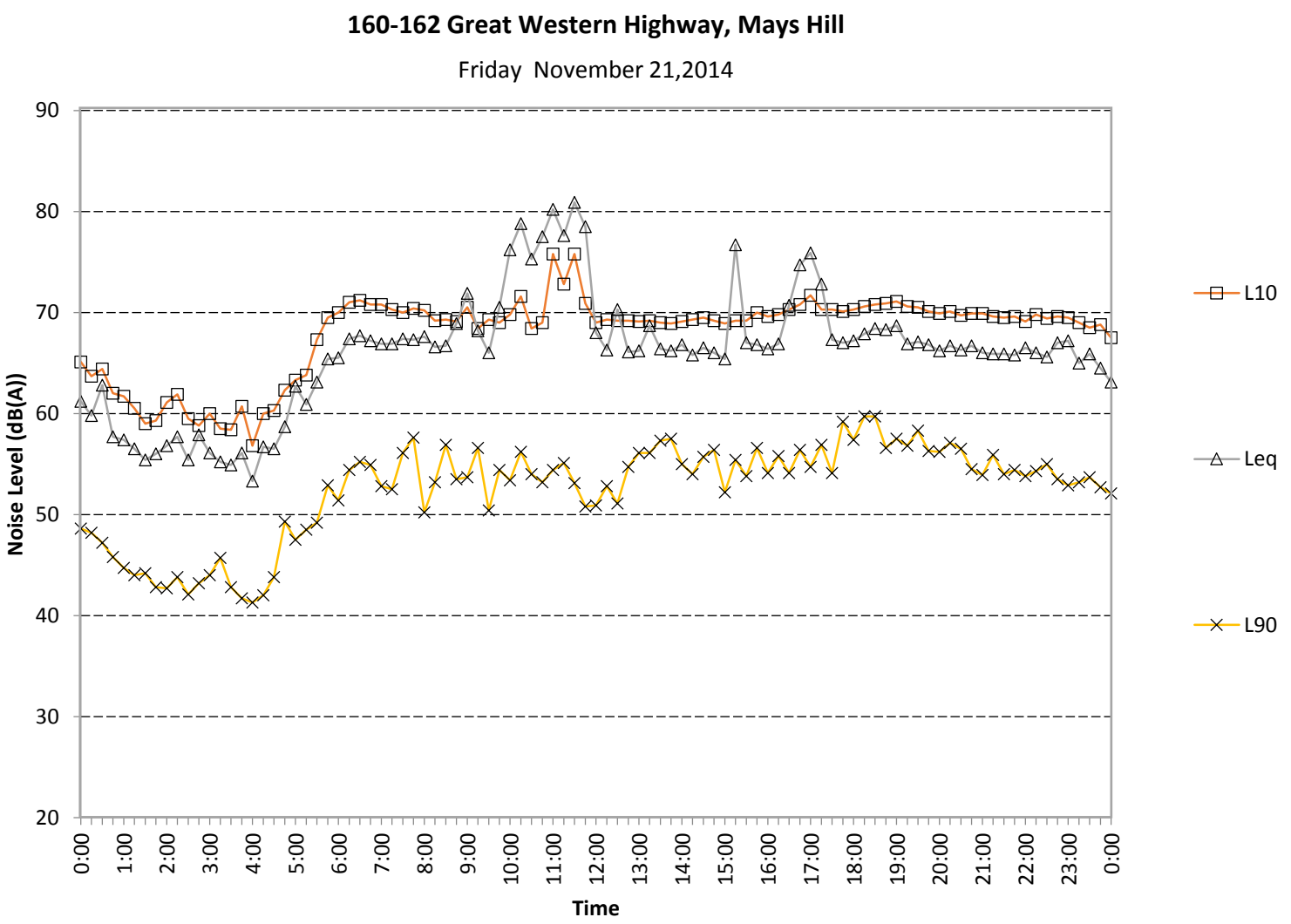
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Friday November 21,2014
Noise Level (dB(A))
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80
70
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0:00
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2:00
3:00
4:00
5:00
6:00
7:00
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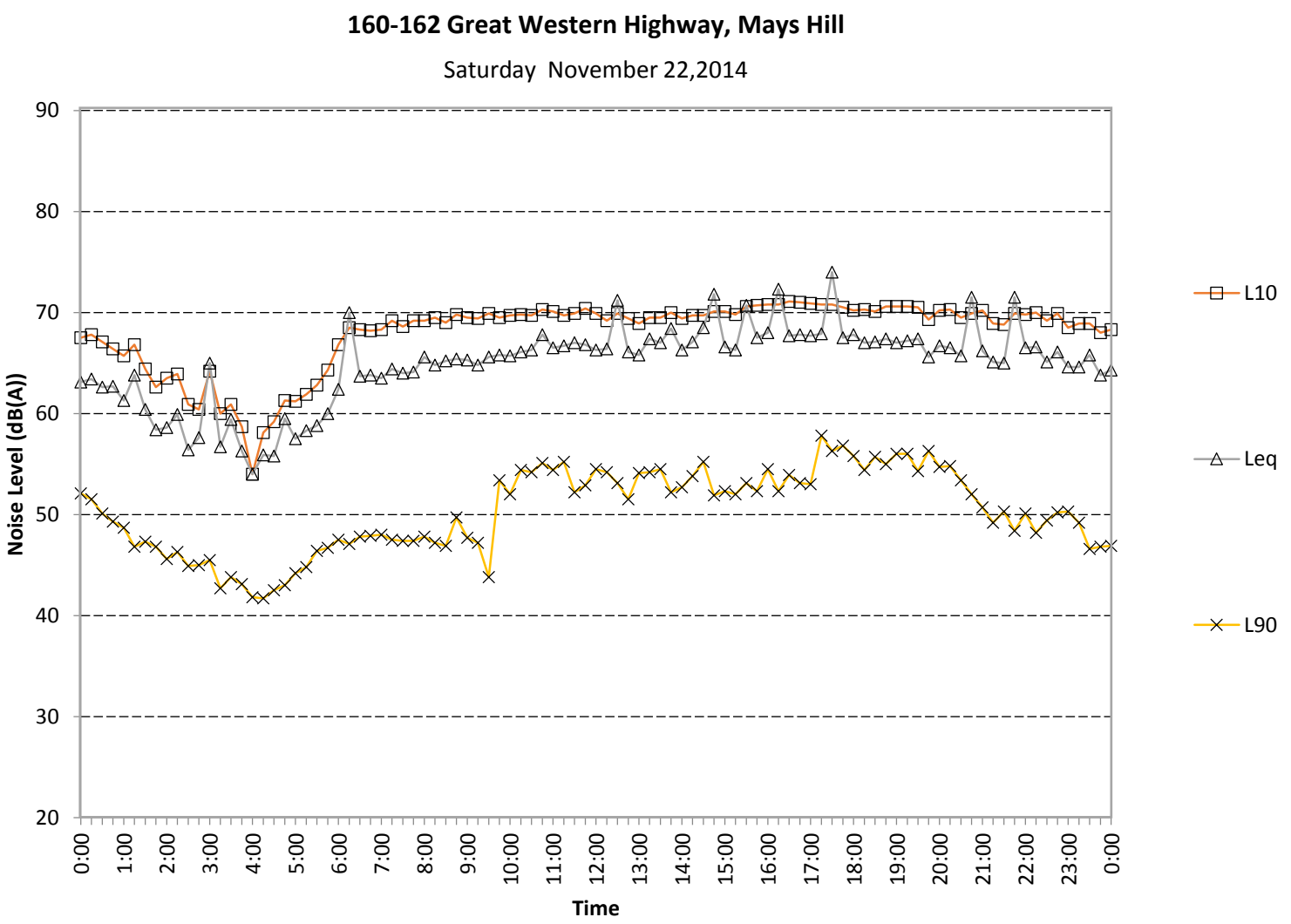
160-162 Great Western Highway, Mays Hill
Saturday November 22,2014
Noise Level (dB(A))
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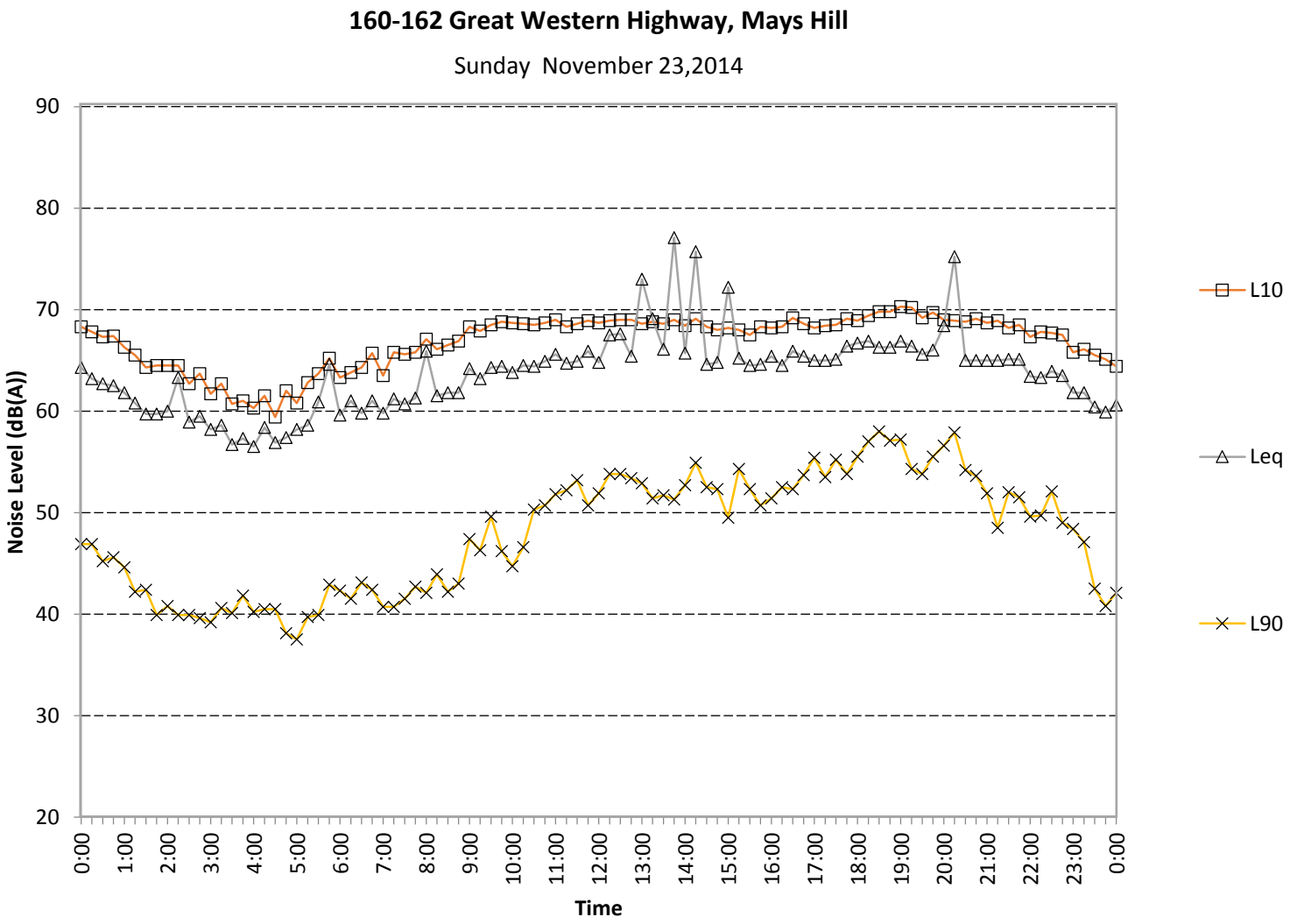
160-162 Great Western Highway, Mays Hill
Sunday November 23,2014
Noise Level (dB(A))
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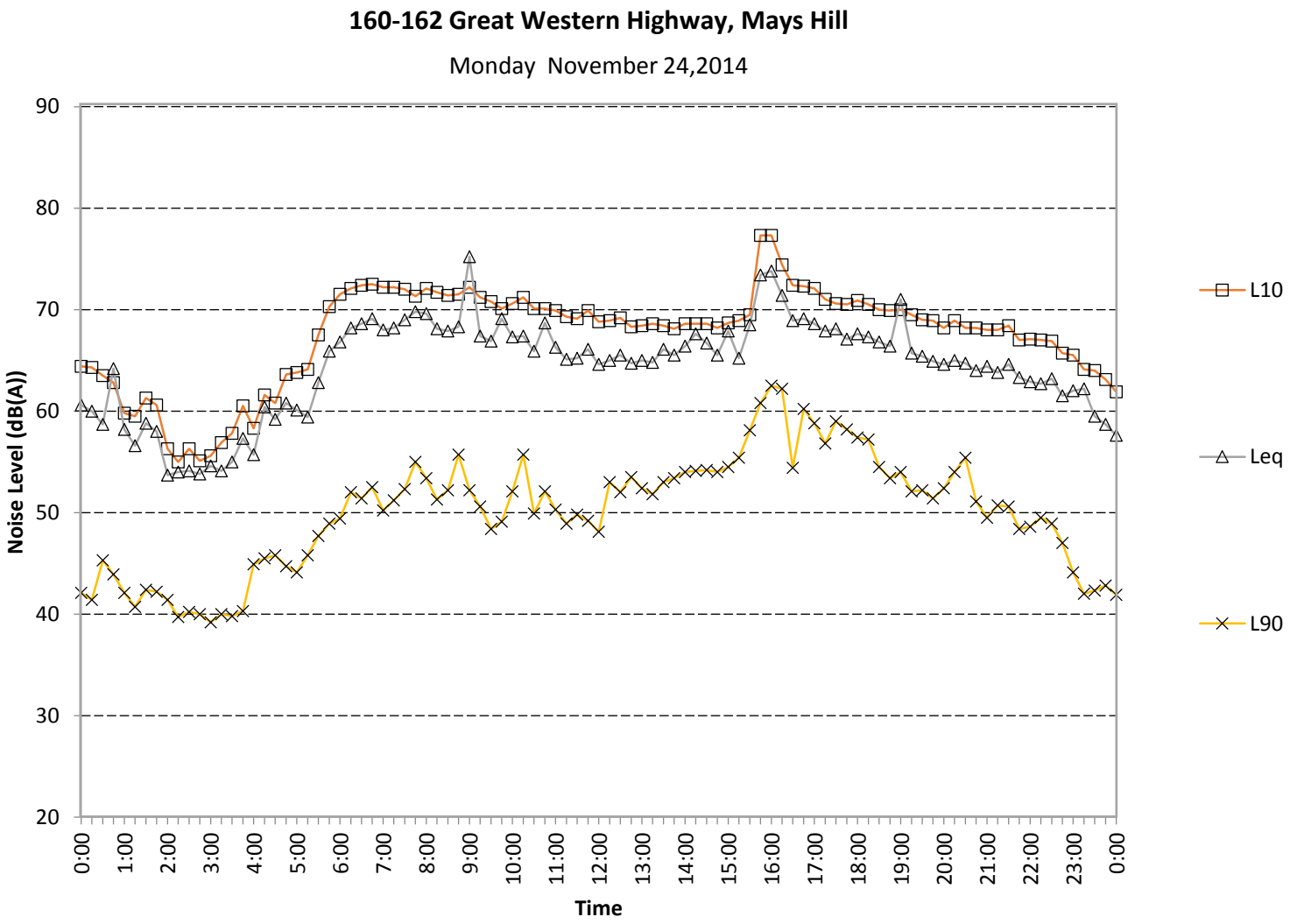
160-162 Great Western Highway, Mays Hill
Monday November 24,2014
Noise Level (dB(A))
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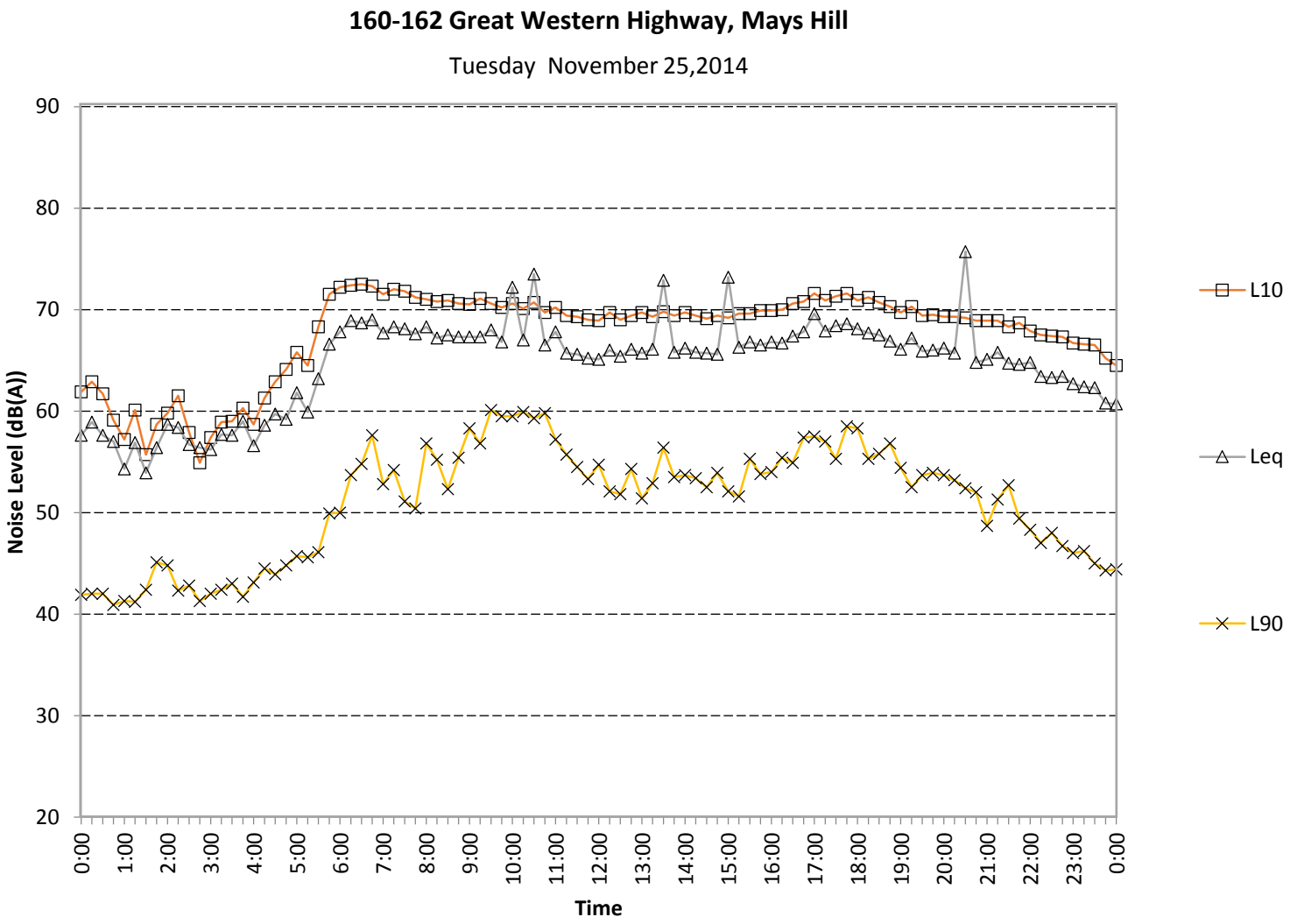
160-162 Great Western Highway, Mays Hill
Tuesday November 25,2014
Noise Level (dB(A))
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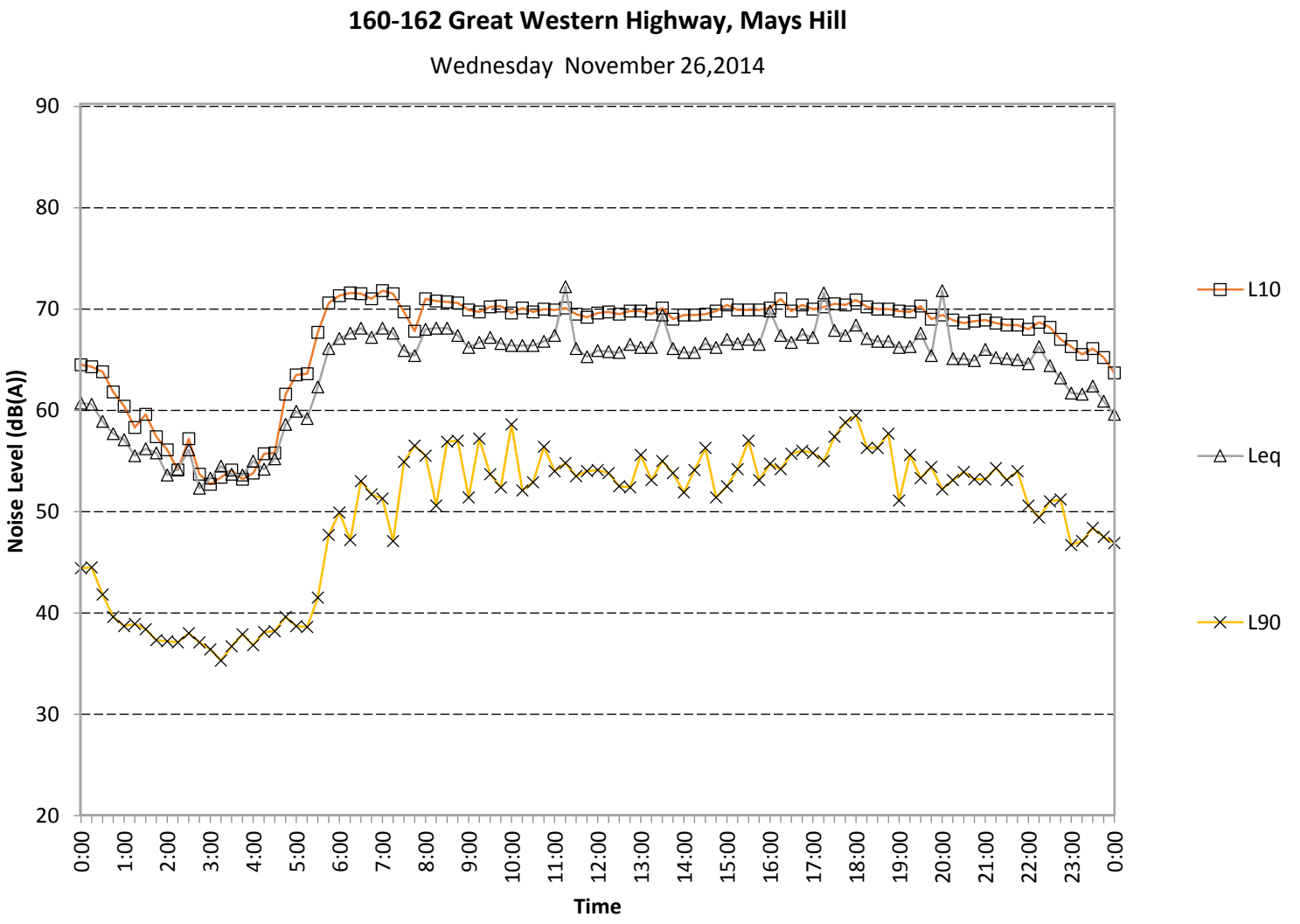
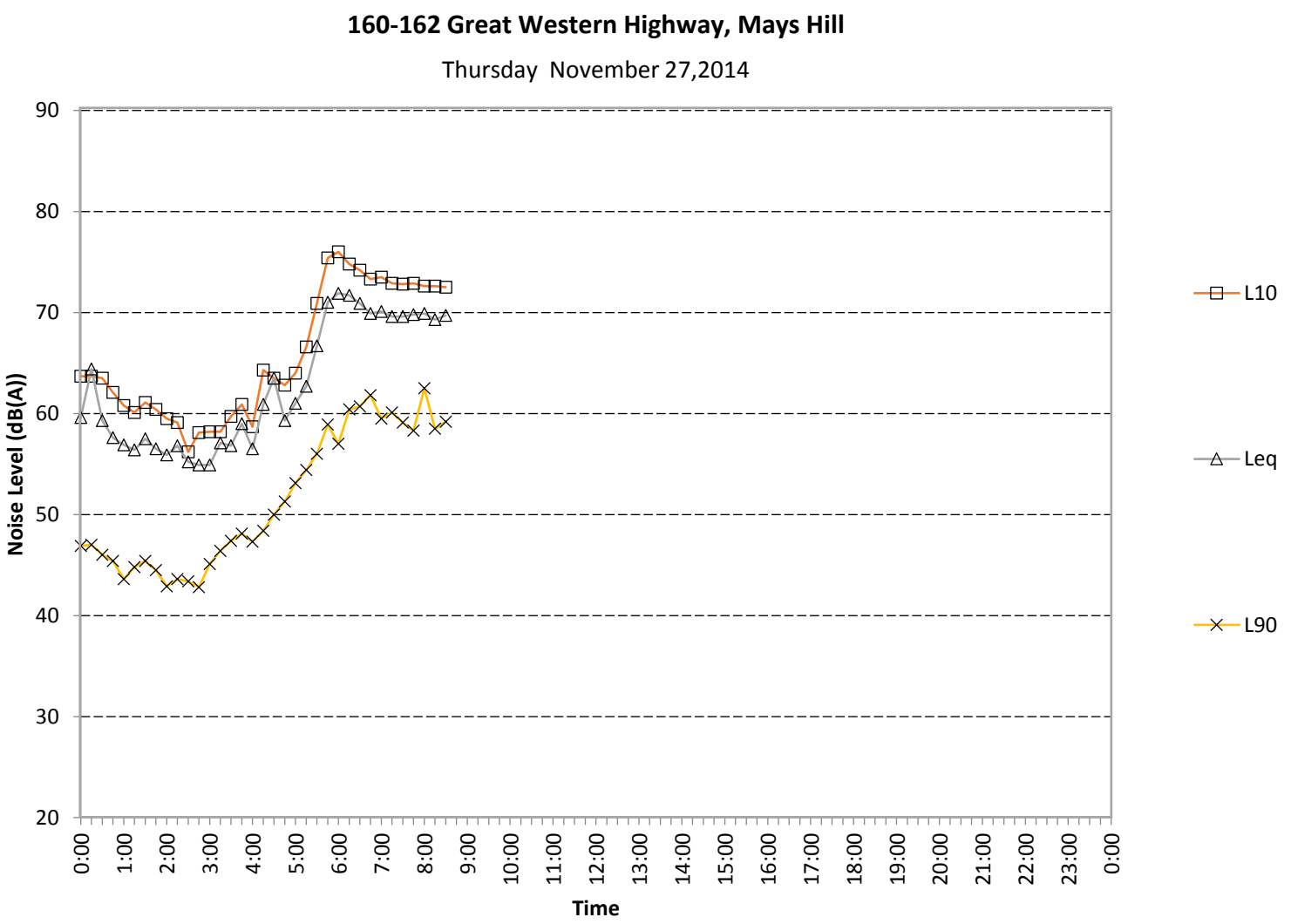
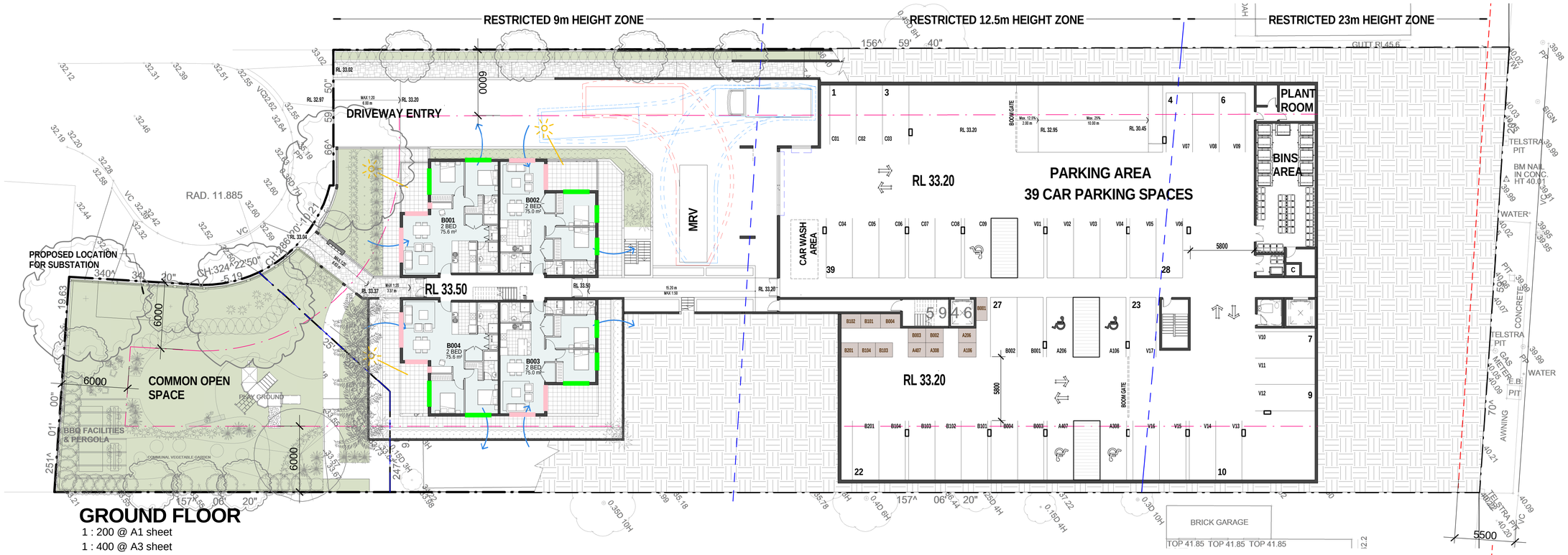
Leq
L90


160-162 Great Western Highway, Mays Hill
Wednesday November 26,2014
Noise Level (dB(A))
90
80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time
L10
Leq
L90


160-162 Great Western Highway, Mays Hill
Thursday November 27,2014
Noise Level (dB(A))
90
80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time
L10
Leq
L90

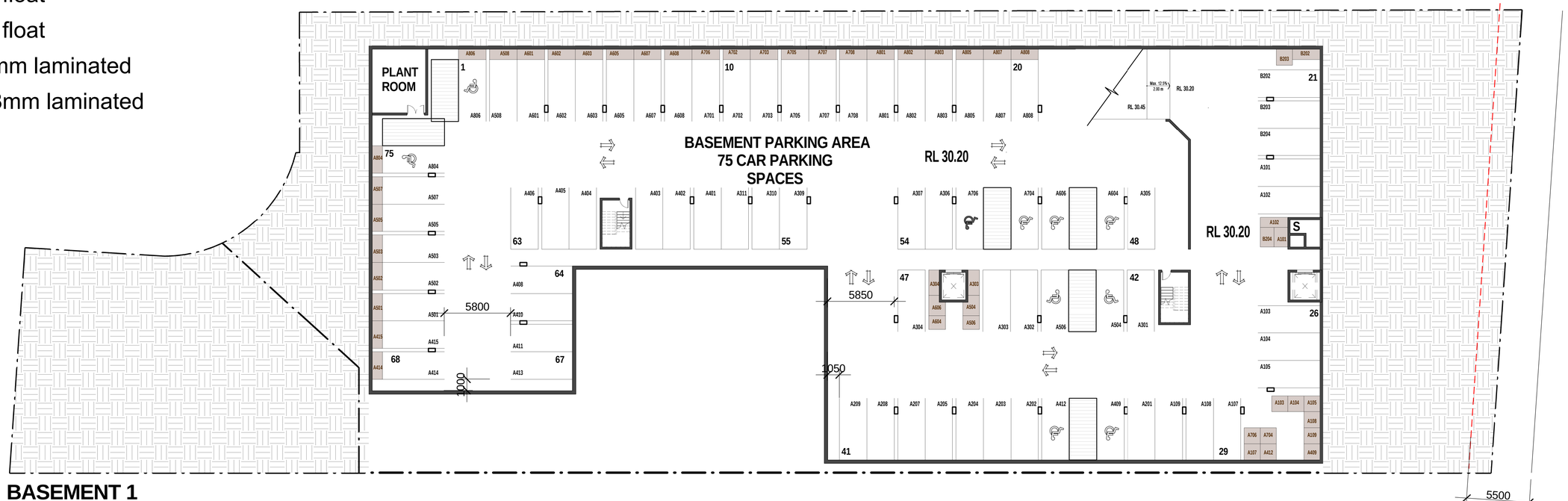
# APPENDIX 2: GLAZING MARK-UPS




## GROUND FLOOR

1 : 200 @ A1 sheet
1 : 400 @ A3 sheet

- 5mm float
- 6mm float
- 6.38mm laminated
- 10.38mm laminated




## BASEMENT 1

1 : 200 @ A1 sheet
1 : 400 @ A3 sheet

| ISSUE | AMENDMENT | DATE | DRAWN | CHECK |
|---|---|---|---|---|
| A | DA SUBMISSION | 08/12/2014 | JA, CWL | NS |

9/12/2014 4:01:16 PM

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TRUE NORTH

PROJECT STATUS :
DEVELOPMENT APPLICATION

PRELIMINARY

SHEET TITLE:
BASEMENT PLAN

| DESIGNED: | DRAWN: | COMMENCED: | SCALE | PRINT: |
|---|---|---|---|---|
| NS | JA, CWL | | 1 : 200 | A1 SHEET |

L.G.A.: HOLROYD COUNCIL

zhinar ARCHITECTS
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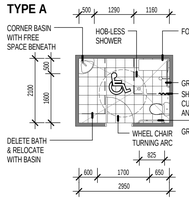
Zhinar Architects Pty Ltd ABN 28 495 869 790
SUITE 1,LEVEL 2 / 2 ROWE STREET, EASTWOOD 2122
TEL:(02)8893 8888 FAX:(02)8893 8833 WEB:www.zhinar.com.au

# Proposed Mixed Development

No.160 Great Western Highway
Mays Hill, NSW 2145

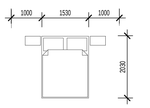
JOB No. 8349
DRAWING No. DA 04
ISSUE: A

**TYPE A**




**TYPE B**




NOTE:

ALL FITTINGS AND INSTALLATION TO COMPLY AS 1428.1
[INCLUDING ALL FITTINGS NOT SHOWN (E.G. TOILET ROLL HOLDER)]

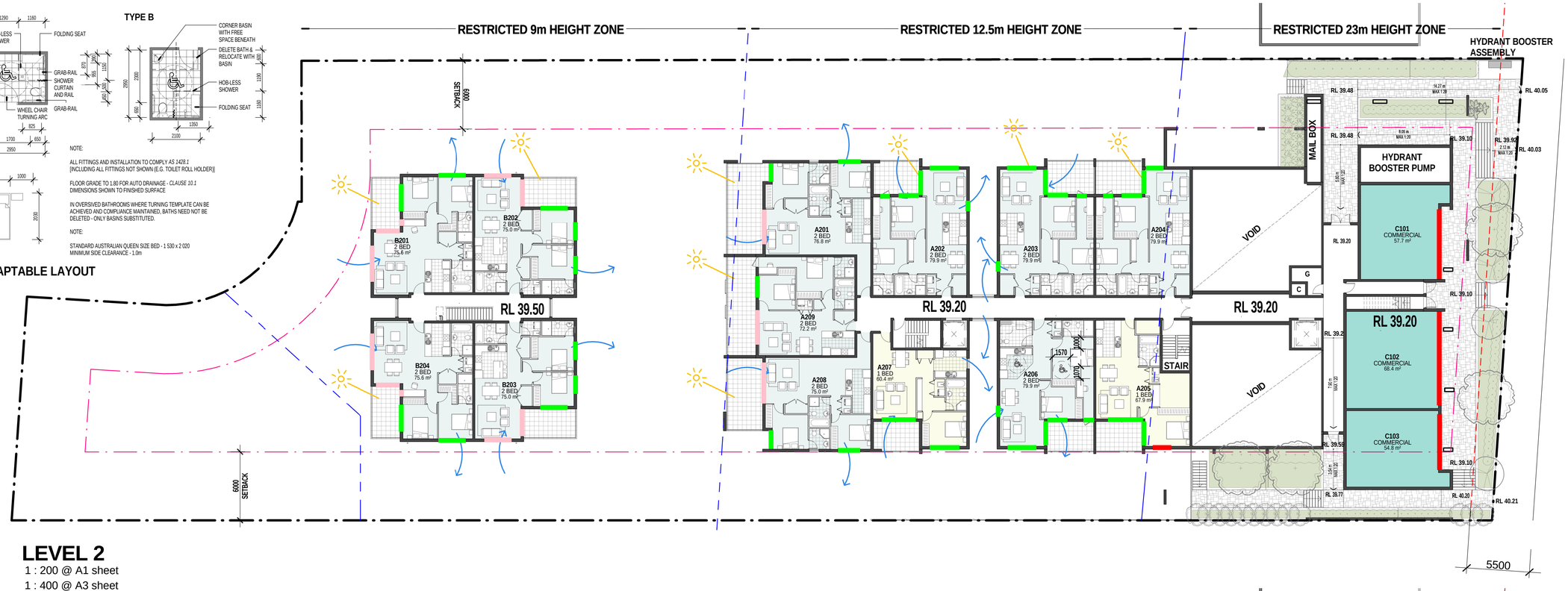
FLOOR GRADE TO 1:80 FOR AUTO DRAINAGE - *CLAUSE 10.1*
DIMENSIONS SHOWN TO FINISHED SURFACE

IN OVERSIVED BATHROOMS WHERE TURNING TEMPLATE CAN BE ACHEIVED AND COMPLIANCE MAINTAINED, BATHS NEED NOT BE DELETED - ONLY BASINS SUBSTITUTED.

NOTE:

STANDARD AUSTRALIAN QUEEN SIZE BED - 1 530 x 2 020
MINIMUM SIDE CLEARANCE - 1.0m

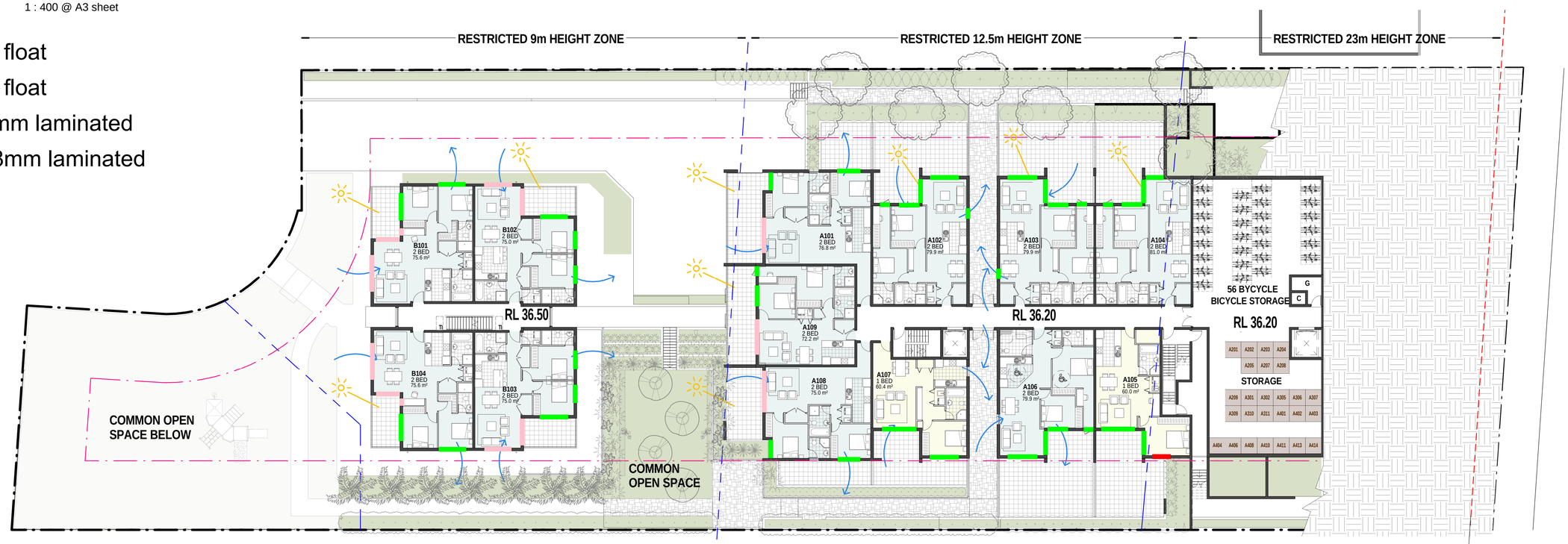
**POST ADAPTABLE LAYOUT**




## LEVEL 2

1 : 200 @ A1 sheet
1 : 400 @ A3 sheet

- 5mm float
- 6mm float
- 6.38mm laminated
- 10.38mm laminated




## LEVEL 1

1 : 200 @ A1 sheet
1 : 400 @ A3 sheet

| ISSUE | AMENDMENT | DATE | DRAWN | CHECK |
|---|---|---|---|---|
| A | DA SUBMISSION | 08/12/2014 | JA, CWL | NS |

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TRUE NORTH

PROJECT STATUS :
DEVELOPMENT APPLICATION

PRELIMINARY

SHEET TITLE:
LEVEL 1 & LVL 2

DESIGNED: NS
DRAWN: JA, CWL
COMMENCED:
SCALE: As indicated
PRINT: A1 SHEET
L.G.A.: HOLROYD COUNCIL

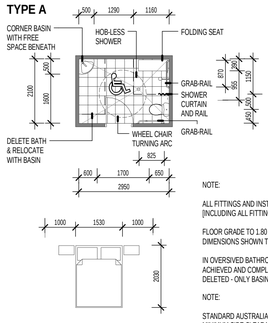
zhinar ARCHITECTS
ZHINAR ARCHITECTS
Zhinar Architects Pty Ltd ABN 26 495 869 790
SUITE 1,LEVEL 2 / 2 ROWE STREET, EASTWOOD 2122
TEL:(02)8893 8888 FAX:(02)8893 8833 WEB:www.zhinar.com.au

# Proposed Mixed Development

No.160 Great Western Highway
Mays Hill, NSW 2145

JOB No. 8349
DRAWING No. DA 05
ISSUE: A

**TYPE A**




**TYPE B**




NOTE:

ALL FITTINGS AND INSTALLATION TO COMPLY AS 1428.1
[INCLUDING ALL FITTINGS NOT SHOWN (E.G. TOILET ROLL HOLDER)]

FLOOR GRADE TO 1:80 FOR AUTO DRAINAGE - CLAUSE 10.1
DIMENSIONS SHOWN TO FINISHED SURFACE

IN OVERSIVED BATHROOMS WHERE TURNING TEMPLATE CAN BE ACHIEVED AND COMPLIANCE MAINTAINED, BATHS NEED NOT BE DELETED - ONLY BASINS SUBSTITUTED.

NOTE:

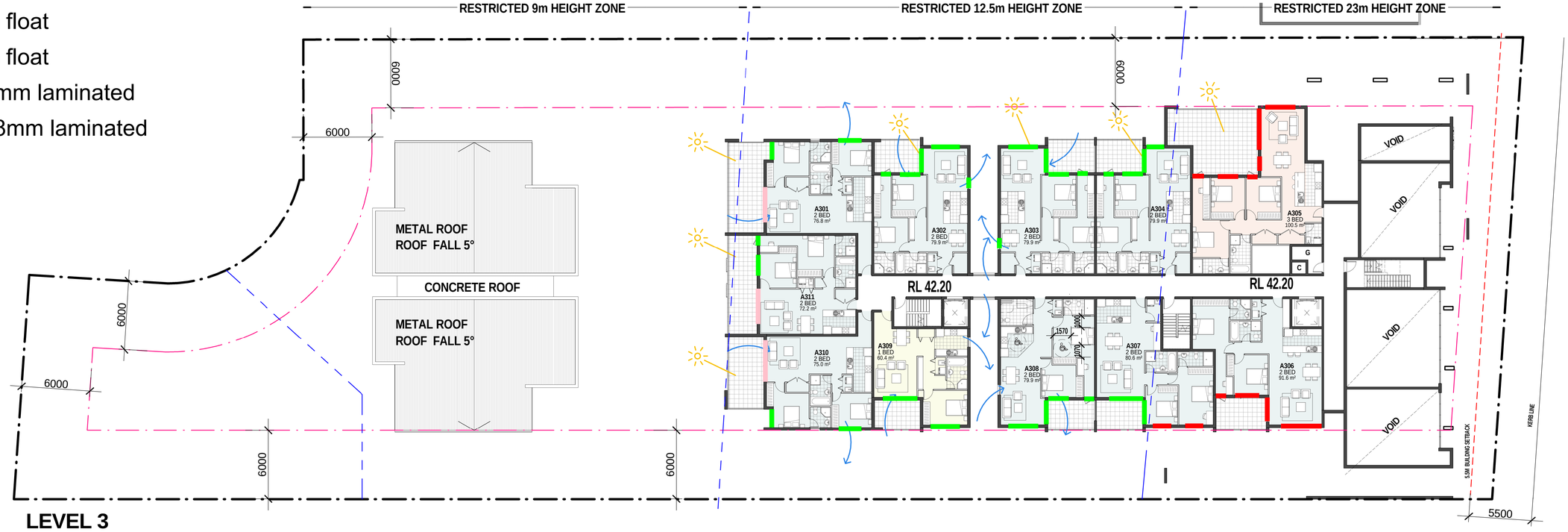
STANDARD AUSTRALIAN QUEEN SIZE BED - 1 530 x 2 020
MINIMUM SIDE CLEARANCE - 1.0m

**POST ADAPTABLE LAYOUT**


## LEVEL 4

1 : 200 @ A1 sheet
1 : 400 @ A3 sheet

- 5mm float
- 6mm float
- 6.38mm laminated
- 10.38mm laminated




## LEVEL 3

1 : 200 @ A1 sheet
1 : 400 @ A3 sheet

| ISSUE | AMENDMENT | DATE | DRAWN | CHECK |
|---|---|---|---|---|
| A | DA SUBMISSION | 08/12/2014 | JA, CWL | NS |

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TRUE NORTH

PROJECT STATUS :
DEVELOPMENT APPLICATION

PRELIMINARY

SHEET TITLE:
LVL 3 & 4

DESIGNED: NS
DRAWN: JA, CWL
COMMENCED:
SCALE: As indicated
PRINT: A1 SHEET
L.G.A.: HOLROYD COUNCIL

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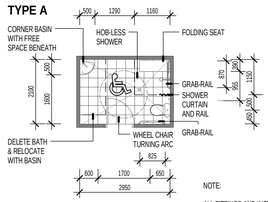
ZHINAR ARCHITECTS Pty Ltd ABN 29 495 869 790
SUITE 1,LEVEL 2 / 2 ROWE STREET, EASTWOOD 2122
TEL:(02)8893 8888 FAX:(02)8893 8833 WEB:www.zhinar.com.au

Proposed Mixed Development

No.160 Great Western Highway
Mays Hill, NSW 2145

JOB No. 8349
DRAWING No. DA 06
ISSUE: A

**TYPE A**




**TYPE B**




NOTE:

ALL FITTINGS AND INSTALLATION TO COMPLY AS 1428.1
[INCLUDING ALL FITTINGS NOT SHOWN (E.G. TOILET ROLL HOLDER)]

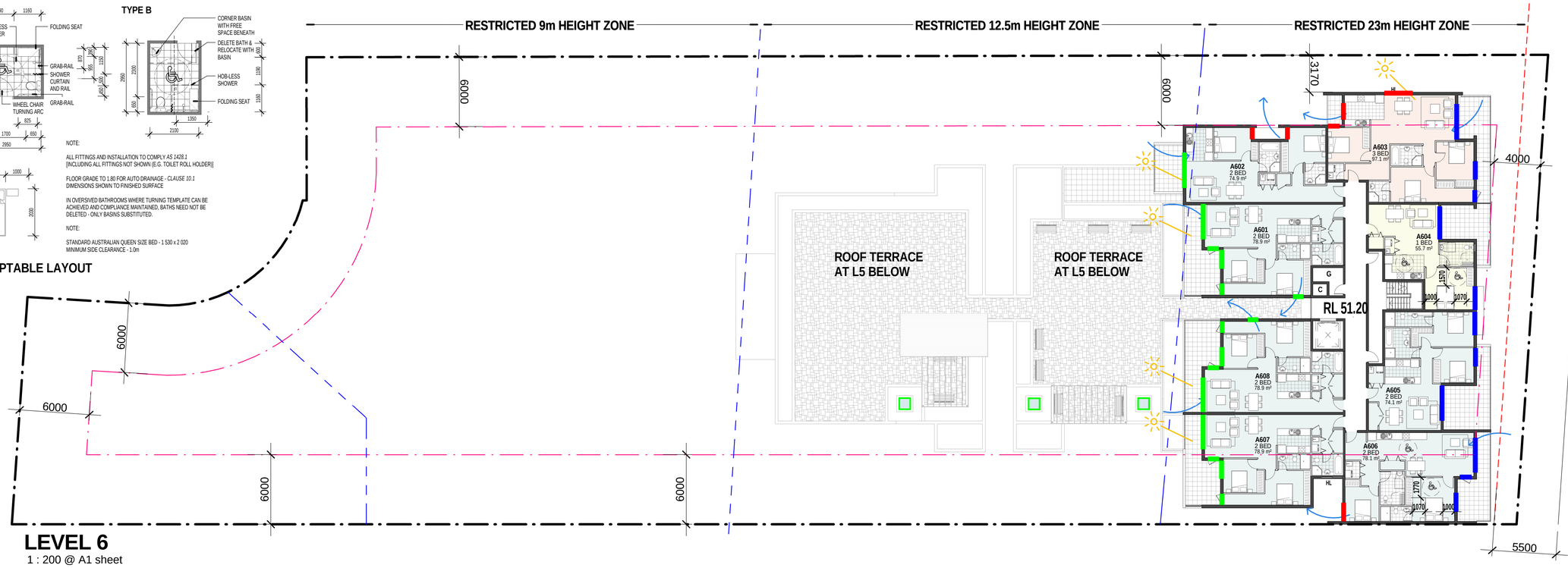
FLOOR GRADE TO 1:80 FOR AUTO DRAINAGE - CLAUSE 10.1
DIMENSIONS SHOWN TO FINISHED SURFACE

IN OVERSIVED BATHROOMS WHERE TURNING TEMPLATE CAN BE ACHIEVED AND COMPLIANCE MAINTAINED, BATHS NEED NOT BE DELETED - ONLY BASINS SUBSTITUTED.

NOTE:

STANDARD AUSTRALIAN QUEEN SIZE BED - 1 530 x 2 020
MINIMUM SIDE CLEARANCE - 1.0m

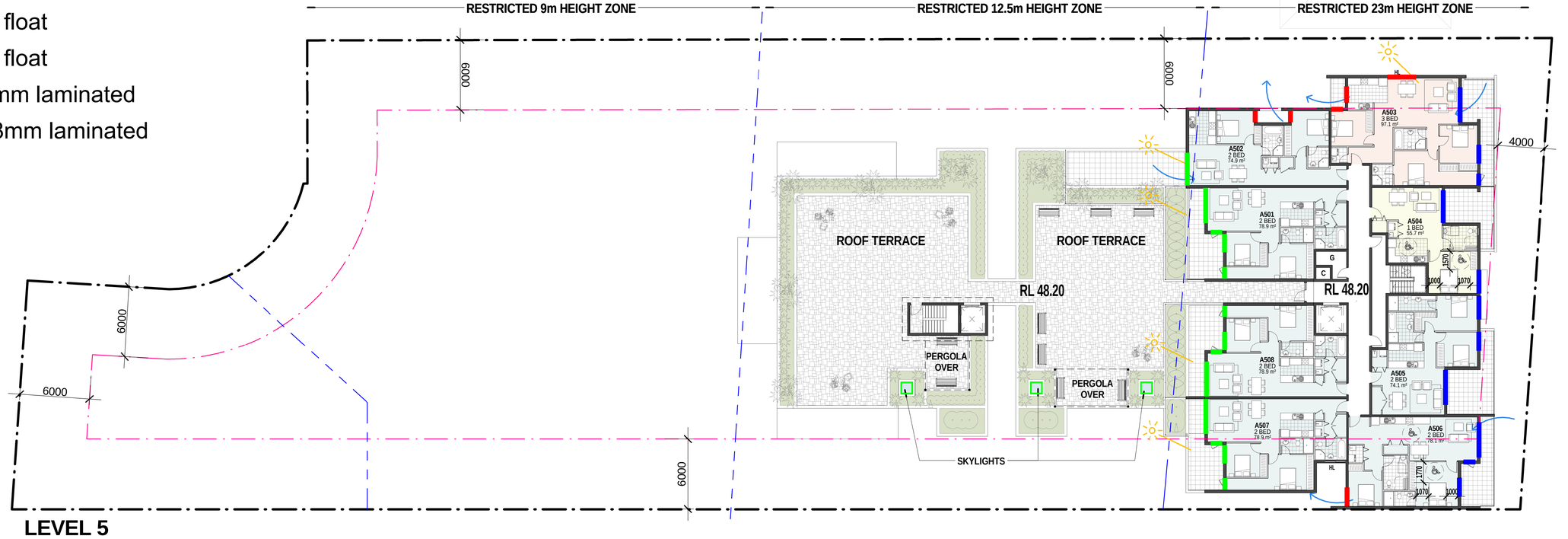
**POST ADAPTABLE LAYOUT**




## LEVEL 6

1 : 200 @ A1 sheet
1 : 400 @ A3 sheet

- 5mm float
- 6mm float
- 6.38mm laminated
- 10.38mm laminated




## LEVEL 5

1 : 200 @ A1 sheet
1 : 400 @ A3 sheet

| ISSUE | AMENDMENT | DATE | DRAWN | CHECK |
|---|---|---|---|---|
| A | DA SUBMISSION | 08/12/2014 | JA, CWL | NS |

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TRUE NORTH

PROJECT STATUS :
DEVELOPMENT APPLICATION

PRELIMINARY

SHEET TITLE:
LVL 5-6

DESIGNED: NS
DRAWN: JA, CWL
COMMENCED:
SCALE: As indicated
PRINT: A1 SHEET
L.G.A.: HOLROYD COUNCIL

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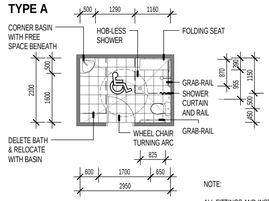
Zhinar Architects Pty Ltd ABN 28 495 869 790
SUITE 1,LEVEL 2 / 2 ROWE STREET, EASTWOOD 2122
TEL:(02)8893 8888 FAX:(02)8893 8833 WEB:www.zhinar.com.au

# Proposed Mixed Development

No.160 Great Western Highway
Mays Hill, NSW 2145

JOB No. 8349
DRAWING No. DA 07
ISSUE: A

**TYPE A**




**TYPE B**




NOTE:

ALL FITTINGS AND INSTALLATION TO COMPLY *AS 1428.1*
[INCLUDING ALL FITTINGS NOT SHOWN (E.G. TOILET ROLL HOLDER)]

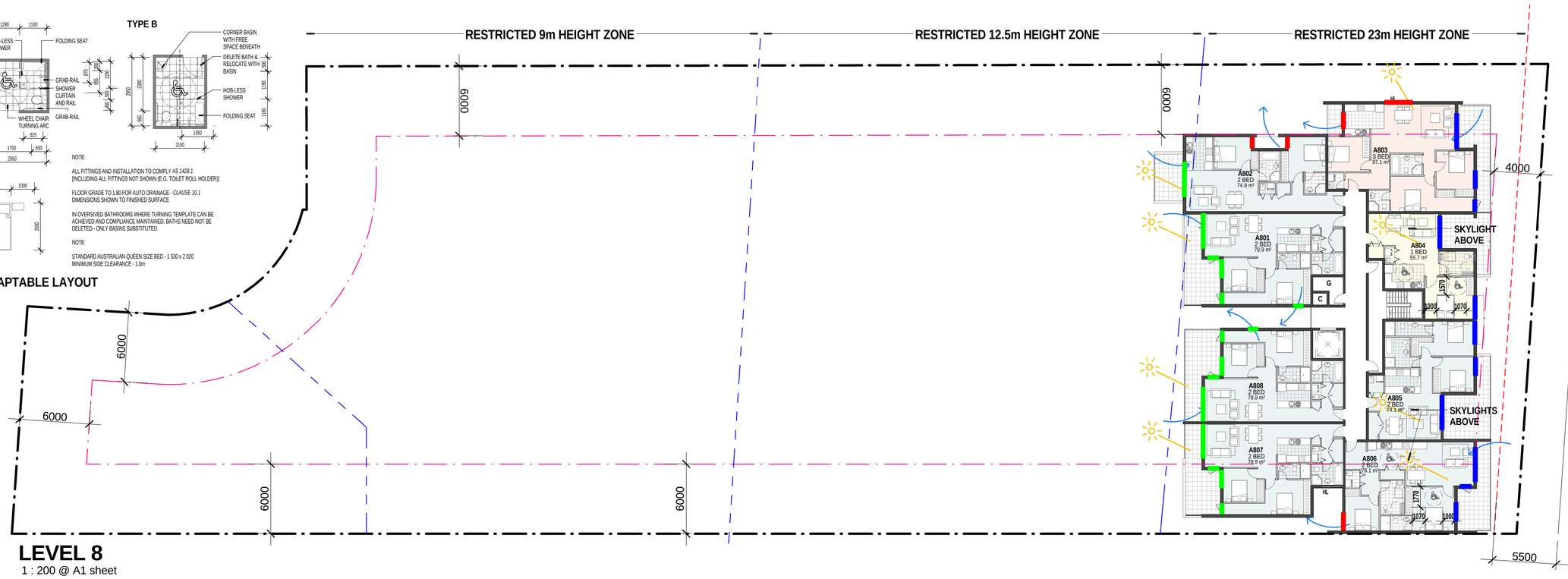
FLOOR GRADE TO 1:80 FOR AUTO DRAINAGE - *CLAUSE 10.1*
DIMENSIONS SHOWN TO FINISHED SURFACE

IN OVERSIVED BATHROOMS WHERE TURNING TEMPLATE CAN BE ACHIEVED AND COMPLIANCE MAINTAINED, BATHS NEED NOT BE DELETED - ONLY BASINS SUBSTITUTED.

NOTE:

STANDARD AUSTRALIAN QUEEN SIZE BED - 1 530 x 2 020
MINIMUM SIDE CLEARANCE - 1.0m

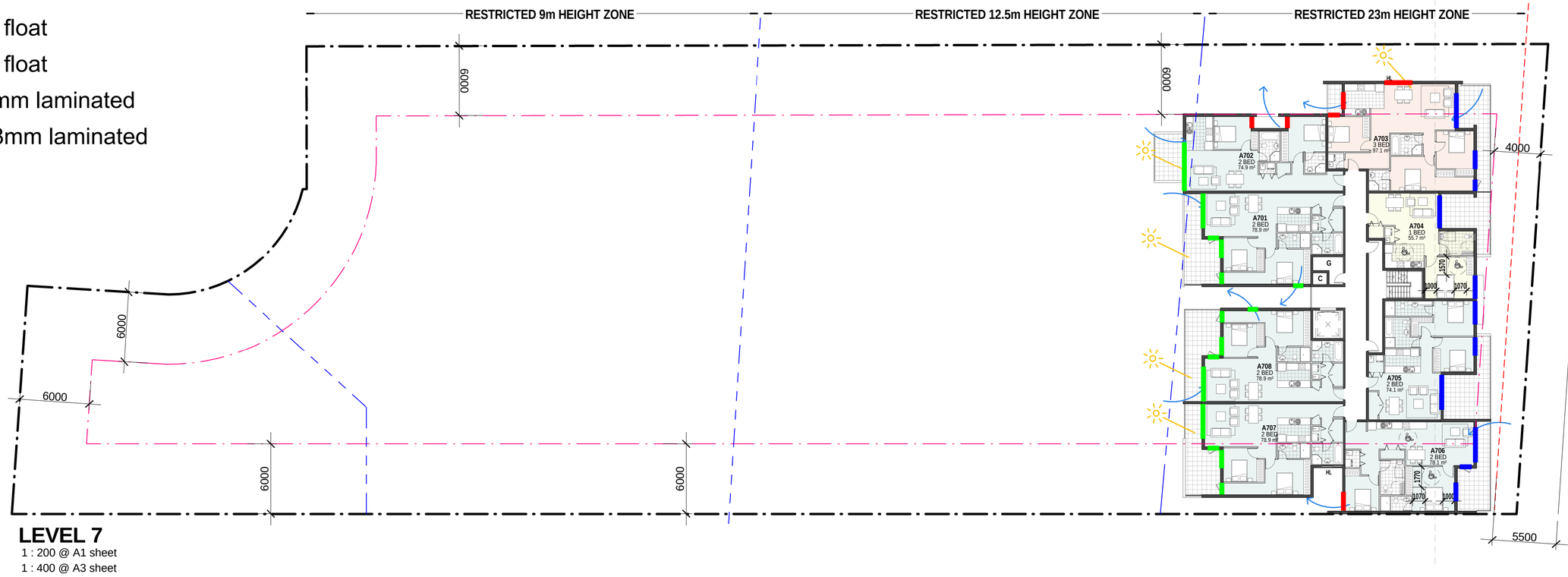
**POST ADAPTABLE LAYOUT**




## LEVEL 8

1 : 200 @ A1 sheet
1 : 400 @ A3 sheet

5mm float
6mm float
6.38mm laminated
10.38mm laminated




## LEVEL 7

1 : 200 @ A1 sheet
1 : 400 @ A3 sheet

| ISSUE | AMENDMENT | DATE | DRAWN | CHECK |
|---|---|---|---|---|
| A | DA SUBMISSION | 08/12/2014 | JA, CWL | NS |

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TRUE NORTH

PROJECT STATUS :
DEVELOPMENT APPLICATION

PRELIMINARY

SHEET TITLE:
LVL 7-8

DESIGNED: Designed JA, CWL
DRAWN:
COMMENCED:
L.G.A.: HOLROYD COUNCIL

SCALE: As indicated
PRINT: A1 SHEET

zhinar ARCHITECTS
Zhinar Architects Pty Ltd ABN 28 495 869 700
SUITE 1 LEVEL 2 / 2 ROWE STREET, EASTWOOD 2122
TEL:(02)8893 8888 FAX:(02)8893 8833 WEB:www.zhinar.com.au

Proposed Mixed Development

No.160 Great Western Highway
Mays Hill, NSW 2145

JOB No. 8349
DRAWING No. DA 08
ISSUE: A