

# Rail Noise Assessment

Existing Coach Dwelling and Secondary Ecotourism Dwelling  
245 Station Lane  
Lochinvar, NSW

Prepared for: HDB Town Planning  
June 2024  
MAC242154-01RP1



# Document Information

## Rail Noise Assessment

Existing Coach Dwelling and Secondary Ecotourism Dwelling

245 Station Lane

Lochinvar, NSW

**Prepared for:** HDB Town Planning

Floor 1, 44 Church Street

Maitland NSW 2320



**Prepared by:** Muller Acoustic Consulting Pty Ltd

PO Box 678, Kotara NSW 2289

ABN: 36 602 225 132

P: +61 2 4920 1833

[www.mulleracoustic.com](http://www.mulleracoustic.com)

DOCUMENT ID	DATE	PREPARED	SIGNED	REVIEWED	SIGNED
MAC242154-01RP1	21 June 2024	Louis Abell		Oliver Muller	

### DISCLAIMER

All documents produced by Muller Acoustic Consulting Pty Ltd (MAC) are prepared for a particular client's requirements and are based on a specific scope, circumstances and limitations derived between MAC and the client. Information and/or report(s) prepared by MAC may not be suitable for uses other than the original intended objective. No parties other than the client should use or reproduce any information and/or report(s) without obtaining permission from MAC. Any information and/or documents prepared by MAC is not to be reproduced, presented or reviewed except in full.

**CONTENTS**

1 INTRODUCTION.....5

2 NOISE POLICY AND GUIDELINES .....7

    2.1 DEVELOPMENT NEAR RAIL CORRIDORS AND BUSY ROADS – INTERIM GUIDELINES .....7

        2.1.1 RAIL NOISE SCREENING TEST.....7

3 EXISTING ENVIRONMENT .....9

4 NOISE ASSESSMENT METHODOLOGY..... 11

    4.1 RAIL NOISE MONITORING..... 11

    4.2 INDICATIVE ATTENUATION LEVELS ..... 12

5 RESULTS ..... 13

    5.1 NOISE ASSESSMENT VALIDATION ..... 13

    5.2 RAIL NOISE PREDICTION RESULTS..... 13

6 DISCUSSION AND SUMMARY OF RECOMMENDATIONS..... 15

7 DISCUSSION AND CONCLUSION ..... 17

APPENDIX A – GLOSSARY OF TERMS

APPENDIX B – NOISE MONITORING CHARTS

APPENDIX C – PROJECT PLANS

APPENDIX D – ACOUSTIC PERFORMANCE OF BUILDING ELEMENTS

*This page has been intentionally left blank*

# 1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by HDB Town Planning (HDB) to prepare a Rail Noise Assessment (RNA) for the existing coach dwelling and proposed secondary ecotourism dwelling located at 245 Station Lane, Lochinvar, NSW.

This report presents the results, findings and recommendations of the RNA and has been prepared to accompany the project's Development Application (DA) for submission to Maitland City Council (MCC).

This assessment has been undertaken in accordance with the following documents:

- NSW Department of Planning – Development Near Rail Corridors and Busy Roads – Interim Guideline, 2008;
- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI) 2017;
- NSW Government, State Environmental Planning Policy (Transport and Infrastructure) 2021;
- NSW Environment Protection Authority (EPA), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- Roads and Traffic Authority (RTA) – Environmental Noise Management Manual (ENMM), December 2001;
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise - General Procedures;
- Standards Australia AS/NZS 2107:2016 (AS2107) – Acoustics - Recommended Design Sound Levels and Reverberation Times for Building Interiors; and
- ISO/TR 17534-3 - Acoustics — Software for the calculation of sound outdoors — Part 3: Recommendations for quality assured implementation of ISO 9613-2 in software according to ISO 17534-1.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

*This page has been intentionally left blank*

## 2 Noise Policy and Guidelines

### 2.1 Development Near Rail Corridors and Busy Roads – Interim Guidelines

Guidance for the specification of internal noise levels of habitable rooms is prescribed in Department of Planning's (DoP) Development near Rail Corridors and Busy Roads – Interim Guidelines (2008) (the guideline). The guideline outlines internal criterion levels for residential dwellings under the State Environmental Planning Policy (Infrastructure) 2008 (superseded by the State Environmental Planning Policy (Transport and Infrastructure) 2021):

*"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:*

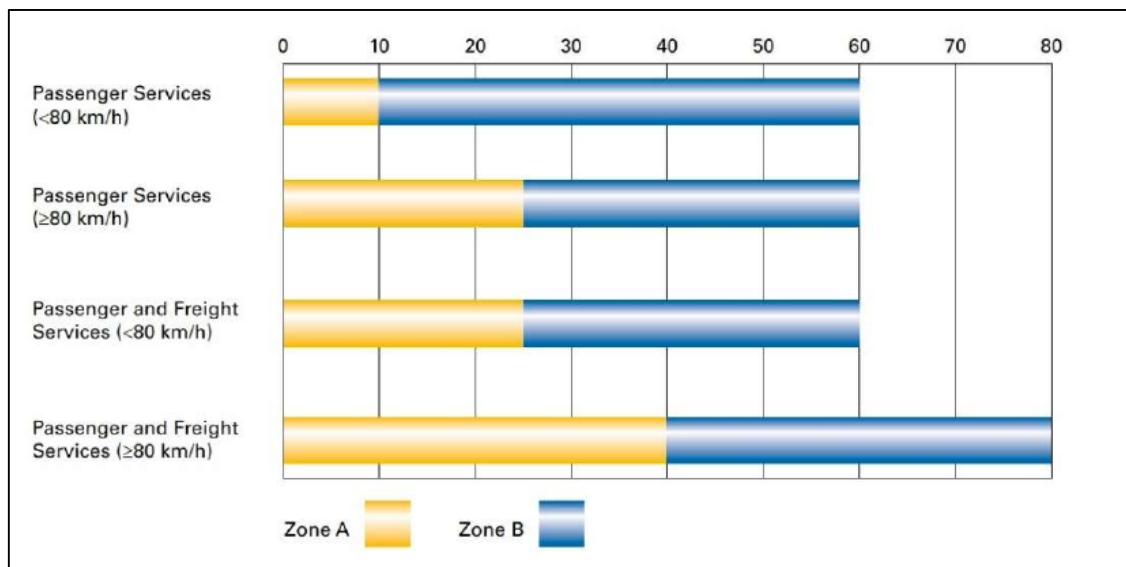
- *in any bedroom in the building: 35dBA at any time 10pm–7am; and*
- *anywhere else in the building (other than a garage, kitchen, bathroom or hallway): 40dBA at any time."*

#### 2.1.1 Rail Noise Screening Test

Section 3.5.1 of the guideline provides assessment zones for developments based on distance to existing rail lines. Two zones are prescribed based on the type of rail activity and proximity to the proposed development (reproduced in **Figure 1**). Where the proposed development is identified as being within Zone A, a full noise assessment is required. In Zone B, Category 2 acoustic treatments are expected to provide adequate attenuation for building occupants.

It is assumed that Zone B standard mitigation measures are based on having windows and external doors closed, therefore ventilation requirements should be considered in accordance with the Building Code of Australia (BCA).

Figure 1 Acoustic Assessment Zones based on distance (m) of noise-sensitive development from operational track.



The proposed developments are located at a distance approximately 90m from the railway line. From site observations and document review, the rail line comprises mainly of passenger trains typically travelling at speed less than 80km/h. Therefore, in accordance with the guideline a detailed acoustic assessment is not mandatory for the project since the site is within Zone B category. Notwithstanding, an assessment has been undertaken given the frequent pass-by events from freight trains through Lochinvar Station. The architectural design of the project should be undertaken with consideration of the recommended internal noise criteria recommended by the guideline.



### 3 Existing Environment

One unattended noise logger was installed in the vicinity of the existing coach house dwelling located at 245 Station Lane, Lochinvar, NSW, from Monday 6 May 2024 to Tuesday 15 May 2024. The logger location and locality plan showing the proposed dwellings with respect to the railway is presented in **Figure 2**. Data from the logger was used to quantify the rail noise contribution and calibrate the model for the RNA.

The unattended noise survey was conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics – Description and Measurement of Environmental Noise".

The measurements were carried out using one Svantek 977 noise analyser. The acoustic instrumentation used carries current NATA calibration and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed  $\pm 0.5$  dBA. All equipment carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per the EPA's Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022).

The results of long-term unattended noise monitoring are provided in **Table 1**. The noise monitoring charts for the background monitoring assessment are provided in **Appendix B**. Data affected by adverse meteorological conditions have been excluded from the results in accordance with methodologies provided in Fact Sheet A4 of the NPI.

**Table 1 Background Noise Monitoring Summary**

Measurement Location	Offset Distance to Rail (m)	Measured Background Noise Level (LA90) dB ABL <sup>1</sup>			Measured Ambient Noise Level dB LAeq(period)		
		Day	Evening	Night	Day	Evening	Night
		L1	90	32	41	36	62

Note 1: Assessment background level (ABL) – the single-figure background level representing each assessment period day, evening and night as per NPI Fact Sheet A.



Note: Excludes periods of wind or rain affected data. Meteorological data obtained from the Bureau of Meteorology weather station Maitland Airport AWS, NSW Site 61428 (32.7023°S 151.4881°E 28m AMSL), Commenced 2016.

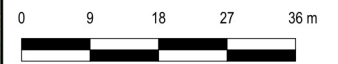
Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.



FIGURE 2  
Locality Plans  
MAC242154-01  
245 Station Lane  
Lochinar

**KEY**

-  Unattended Noise Monitoring
-  Dwellings



## 4 Noise Assessment Methodology

### 4.1 Rail Noise Monitoring

A theoretical assessment of rail noise was carried out to predict levels at the façade of the proposed dwelling on the project site using Brüel and Kjær Predictor Type 7810 (Version 11.10) noise modelling software. Noise predictions were carried out using the RMR 2009 Dutch calculation algorithms for railway noise that takes into account:

- the noise emission level by source height and by octave;
- attenuation from geometrical divergence;
- attenuation due to propagation;
- attenuation due to barriers;
- attenuation due to propagation in housing regions, if applicable; and
- the noise level reduction because of reflections, where applicable.

Rail freight movements past Lochinvar Station were sourced from the Federal Government Department of Infrastructure, Transport, Regional Development Communication and the Arts (DITDRCA) National freight data from government and industry. The data collected from 2022 to 2023 indicates approximately 4,600 rail freight movements eastbound and westbound from Lochinvar Station. This equates to an annual average volume of 13 movements per 24 hours. Additionally, data collected from Transport for NSW (TfNSW) trip planner indicates approximately 15 passenger train movements per day, and one to four passenger train movements per night.

## 4.2 Indicative Attenuation Levels

Prior to discussing the results and findings of this assessment, it is important to establish typical levels of attenuation for dwellings that may be established on the project site. The Environmental Noise Management Manual (ENMM) (2001) provides a summary of indicative attenuation from standard building types. The indicative attenuation levels are summarised in **Table 2**, which provides typical performance of buildings with respect to noise reduction.

A light frame residence with single glazing would be expected to provide a reduction of 20dBA from external to internal with windows closed. Where windows are closed, the fresh air requirements outlined in the Building Code of Australia are to be satisfied.

**Table 2 Indicative Building Noise Attenuation**

Building Type	Windows	Internal noise reduction, dBA
All	Open	10
Light Frame	Single glazed(closed)	20
Masonry	Single glazed (closed)	25
	Double glazed (closed)	30

Note: Sourced from ENMM, 2001.

## 5 Results

### 5.1 Noise Assessment Validation

Rail noise predictions were compared to measured levels at logging location L1. This is considered a good practice technique to validate the assumptions made in the assessment. Results of the validation are presented in **Table 3**. Noise predictions demonstrate an acceptable consistency when compared against measured levels (ie  $\pm 2$ dB).

**Table 3 Noise Assessment Validation Results<sup>1</sup>**

Measurement Location	Predicted Train, LAeq, dBA		Measured Train, LAeq, dBA		Difference, dB	
	Day	Night	Day	Night	Day	Night
L1	61.9	58.5	61.3	59.8	0.6	-0.3

Note: Rail noise is assessed over two periods, Day 7am to 10pm and Night 10pm to 7am (ie no evening).

Note 1: Free field measurement.

### 5.2 Rail Noise Prediction Results

The project plans (**Appendix C**) have been reviewed and incorporated into the assessment. Two calculation scenarios have been completed for the project and include an assessment of day and night noise levels.

Alterations to the coach house includes an open plan living dining area, kitchen, bathroom and one bedroom. The open plan living and dining area, as well and the bedroom both have windows on the northern façade of the building facing the rail line and are expected to be the weakest pathway for noise intrusion associated with rail noise.

The studio that is proposed to be converted into an ecotourism facility has a similar layout with one bedroom and living room with widows on the northern façade facing the rail line.

**Table 4** presents a comparison of predicted rail noise against the respective day and night internal criteria for each habitable room of the project dwellings. The noise transmission from the rail noise to the receivers was assumed via the weakest path of the façade which is through the windows of the project.

<b>Table 4 Noise Assessment Results<sup>1</sup></b>						
Façade	Element	Room Category	Predicted Level (internal)		Internal Criteria	
			dB LAeq		dB LAeq	
			Day	Night	Day	Night
<b>Coach House</b>						
Northern	Window	Living Room	41	37	40	40
Northern	Window	Bedroom	40	38	40	35
<b>Eco-Tourism Facility</b>						
Northern	Window	Living Room	40	37	40	40
Northern	Window	Bedroom	40	37	40	35

Results identify that both the bedroom area at the coach house and the ecotourism facility have the potential to be exposed to rail traffic noise above the relevant criteria (35dBA) during the night period. Acoustic treatment to the windows in these spaces are recommended to address the rail noise impacts. Recommended noise treatment options are outlined in **Section 6**.

## 6 Discussion and Summary of Recommendations

Noise predictions outline that acoustic treatment should be considered for the windows of both bedrooms facing the rail line, to attenuate noise intrusion and satisfy relevant internal criteria. **Table 5** provides the recommended building categories for windows/sliding doors at each assessed room. Corresponding Weighted Sound Reduction Index (Rw) associated with the building elements in accordance with Appendix C of the DoP Guideline, and a visual layout of the recommended treatment areas are detailed in **Appendix D**.

Table 5 Rail Noise Control Treatments – Proposed Dwellings			
Facade	Element	Room	Noise Control Treatment
<b>Coach House</b>			
Northern	Window	Living Room	Standard Glazing
Northern	Window	Bedroom	Category 2 Glazing
<b>Eco-Tourism Facility</b>			
Northern	Window	Living Room	Standard Glazing
Northern	Window	Bedroom	Category 2 Glazing

Note: Standard glazing assumes a minimum Rw of 20.

*This page has been intentionally left blank*



## 7 Discussion and Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Rail Noise Assessment (RNA) of potential rail noise impacts for the existing coach dwelling and proposed secondary ecotourism dwelling located at 245 Station Lane, Lochinvar, NSW.

The assessment has qualified the existing ambient environment with respect to rail noise, using measured levels to calibrate predictions. Noise predictions identify that Category 2 acoustic treatments are recommended for the window components of the bedrooms on the northern façade of both developments to attenuate internal levels and satisfy relevant criteria. The results of the RNA demonstrate that with the building design elements outlined in **Table 5**, the required rail noise reduction for each room type is achievable and would achieve compliance with relevant internal noise criteria for the future dwellings proposed to be constructed in the building footprint.

In summary, the Rail Noise Assessment supports the Development Application for the project provided the recommendations outlined in this assessment are implemented.

*This page has been intentionally left blank*

# Appendix A – Glossary of Terms

A number of technical terms have been used in this report and are explained in **Table A1**.

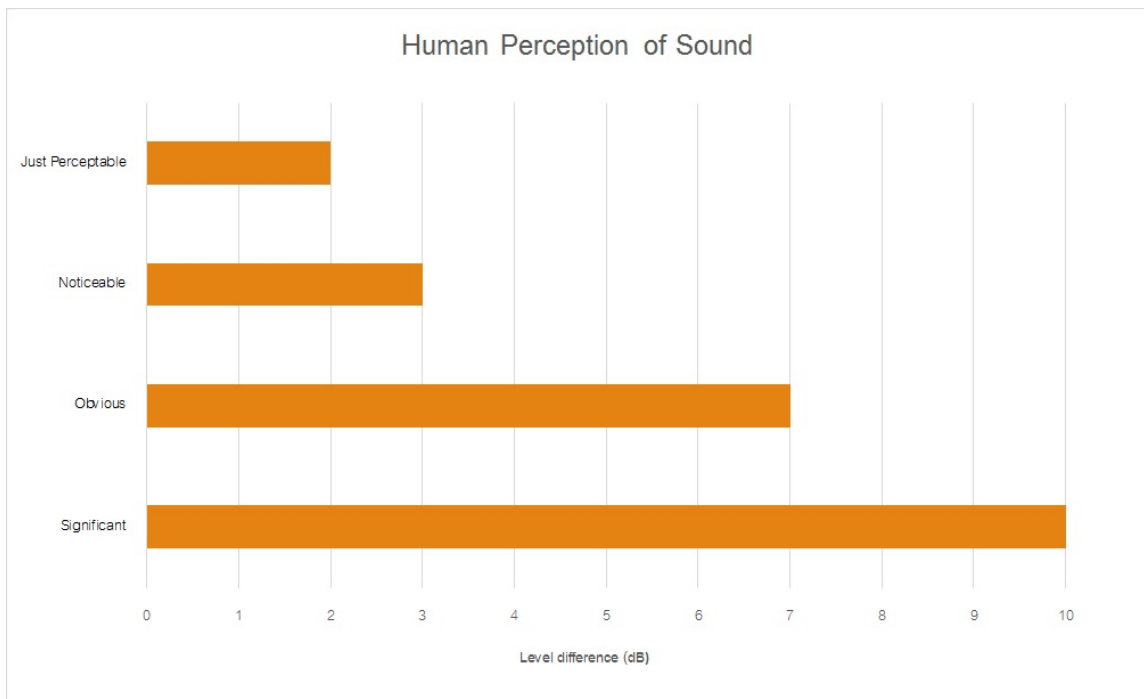
<b>Table A1 Glossary of Acoustical Terms</b>	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The total noise associated with a given environment. Typically, a composite of sounds from all sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to sound.
Background Noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is usually represented by the LA90 descriptor
dba	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Z-weighted or decibels Linear (unweighted).
Extraneous Noise	Sound resulting from activities that are not typical of the area.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A sound level which is exceeded 10% of the time.
LA90	Commonly referred to as the background noise, this is the level exceeded 90% of the time.
LAeq	Represents the average noise energy or equivalent sound pressure level over a given period.
LAm <sub>ax</sub>	The maximum sound pressure level received at the microphone during a measuring interval.
Masking	The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street.
RBL	The Rating Background Level (RBL) as defined in the NPI, is an overall single figure representing the background level for each assessment period over the whole monitoring period. The RBL, as defined is the median of ABL values over the whole monitoring period.
Sound power level (L <sub>w</sub> or SWL)	This is a measure of the total power radiated by a source in the form of sound and is given by $10 \cdot \log_{10} (W/W_0)$ . Where W is the sound power in watts to the reference level of $10^{-12}$ watts.
Sound pressure level (L <sub>p</sub> or SPL)	the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from L <sub>w</sub> in that it is the sound level at a receiver position as opposed to the sound 'intensity' of the source.

Table A2 provides a list of common noise sources and their typical sound level.

**Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA**

Source	Typical Sound Pressure Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

**Figure A1 – Human Perception of Sound**



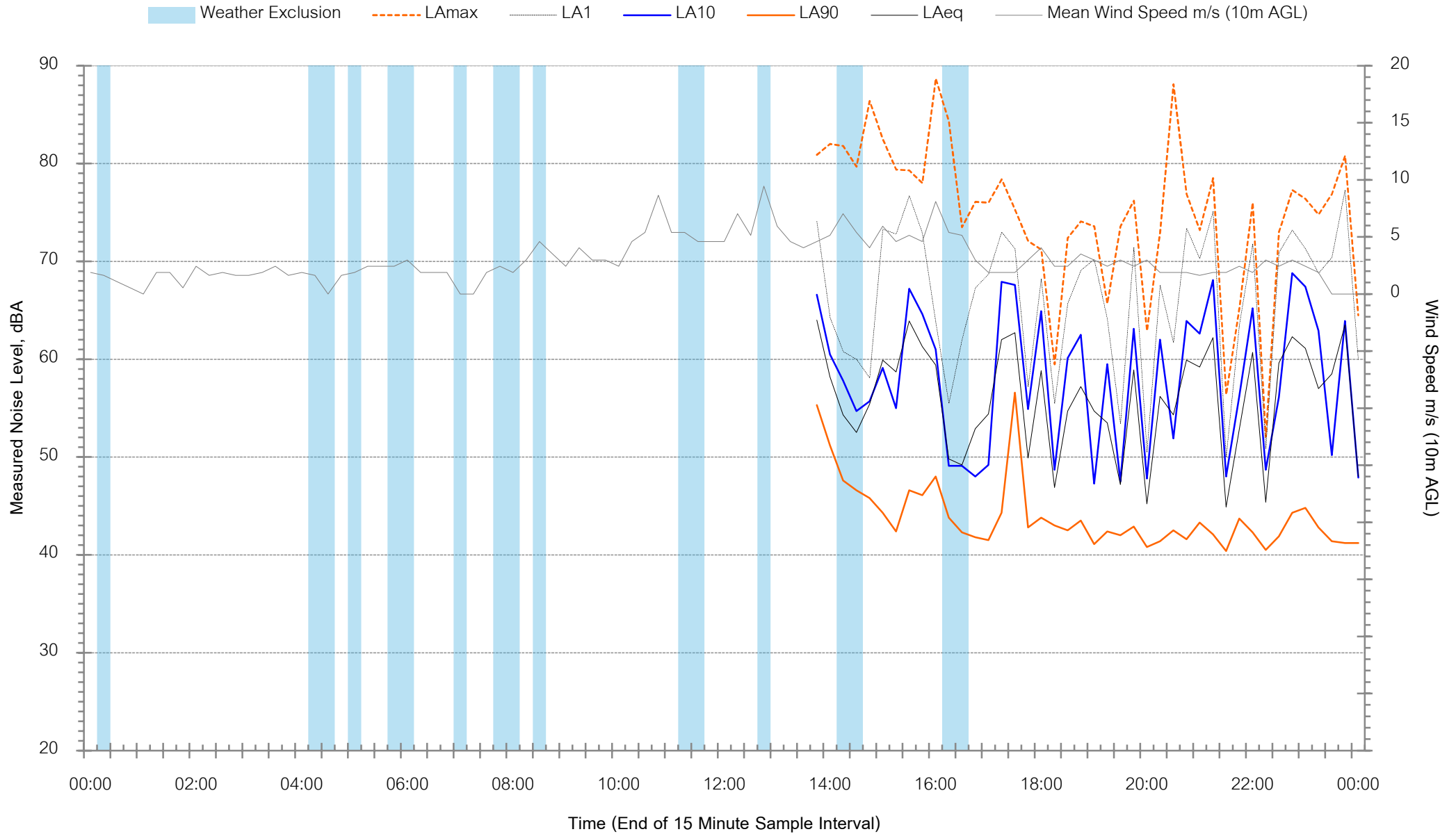
*This page has been intentionally left blank*

# Appendix B – Noise Monitoring Charts



# Background Noise Levels

245 Station Lane, Lochinvar NSW - Monday 6 May 2024

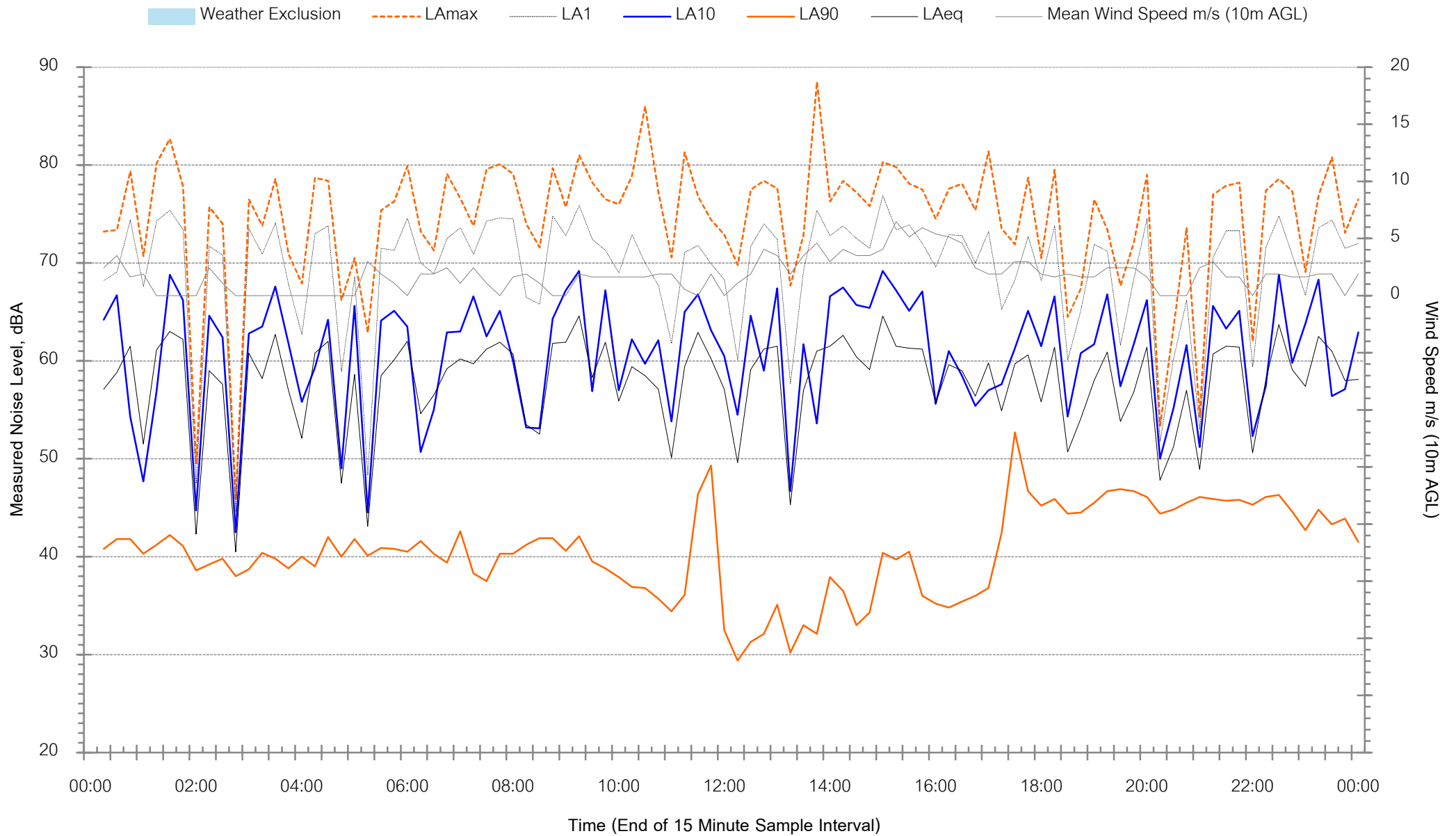






# Background Noise Levels

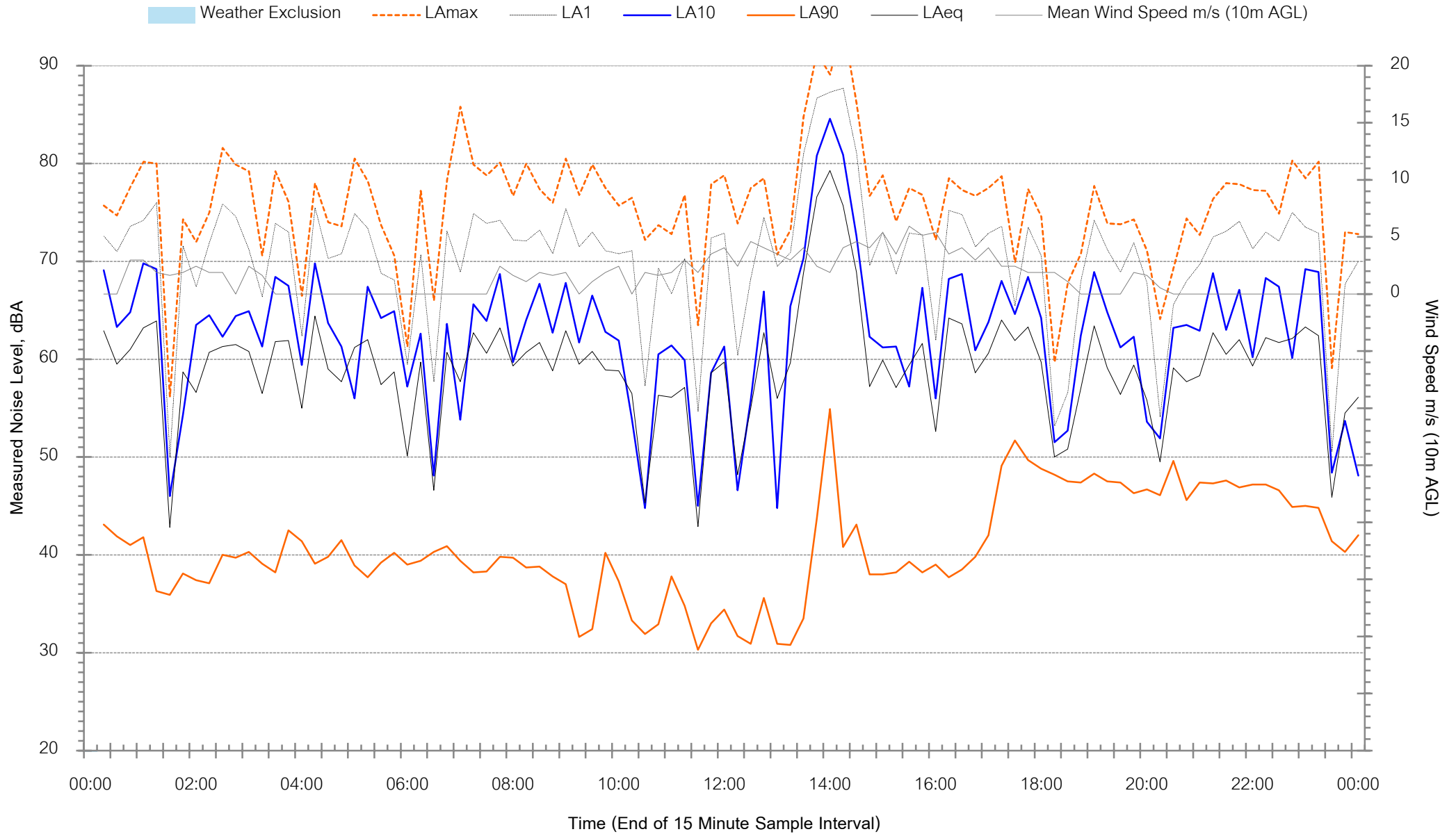
245 Station Lane, Lochinvar NSW - Tuesday 7 May 2024





# Background Noise Levels

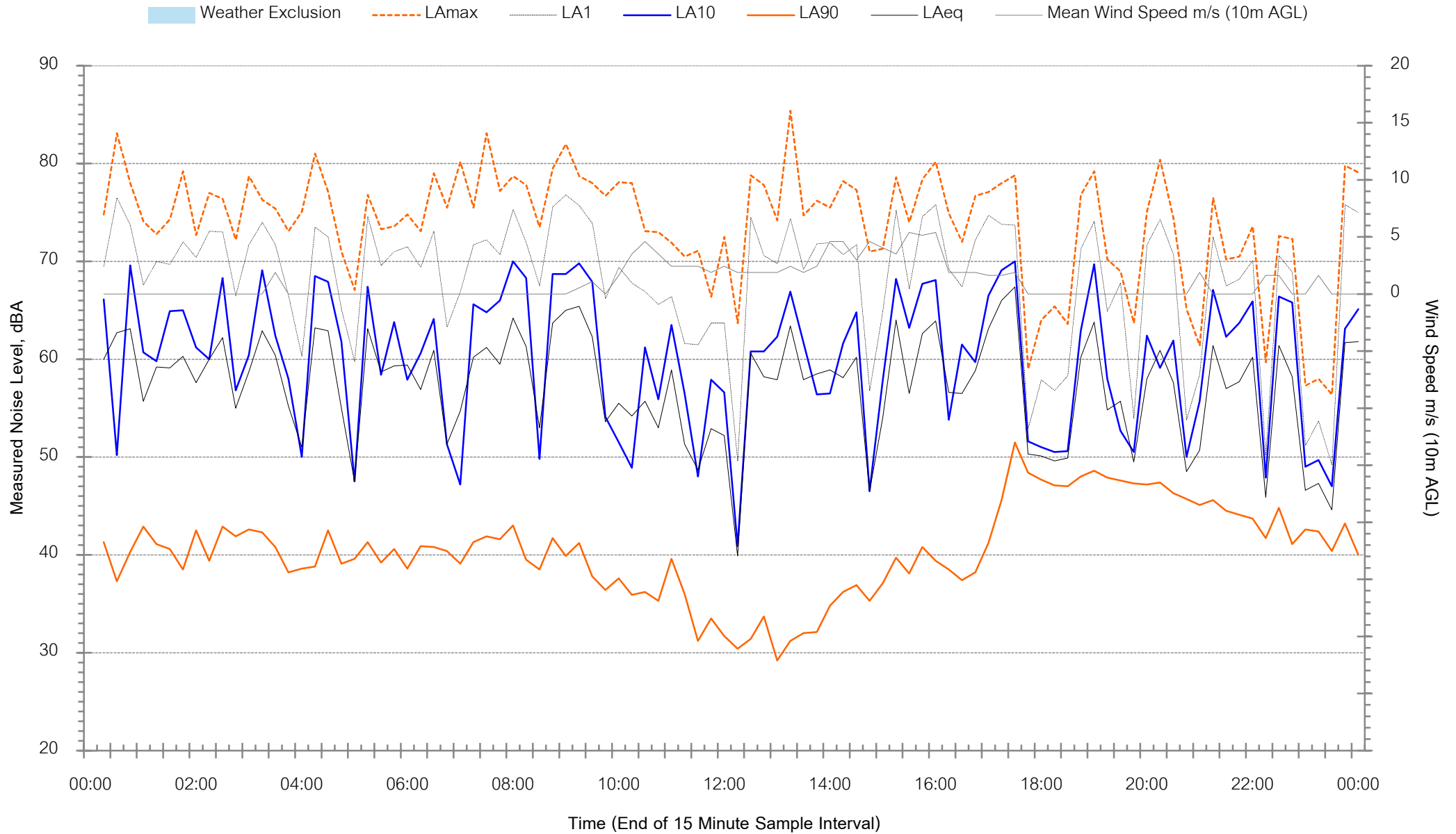
245 Station Lane, Lochinvar NSW - Wednesday 8 May 2024





# Background Noise Levels

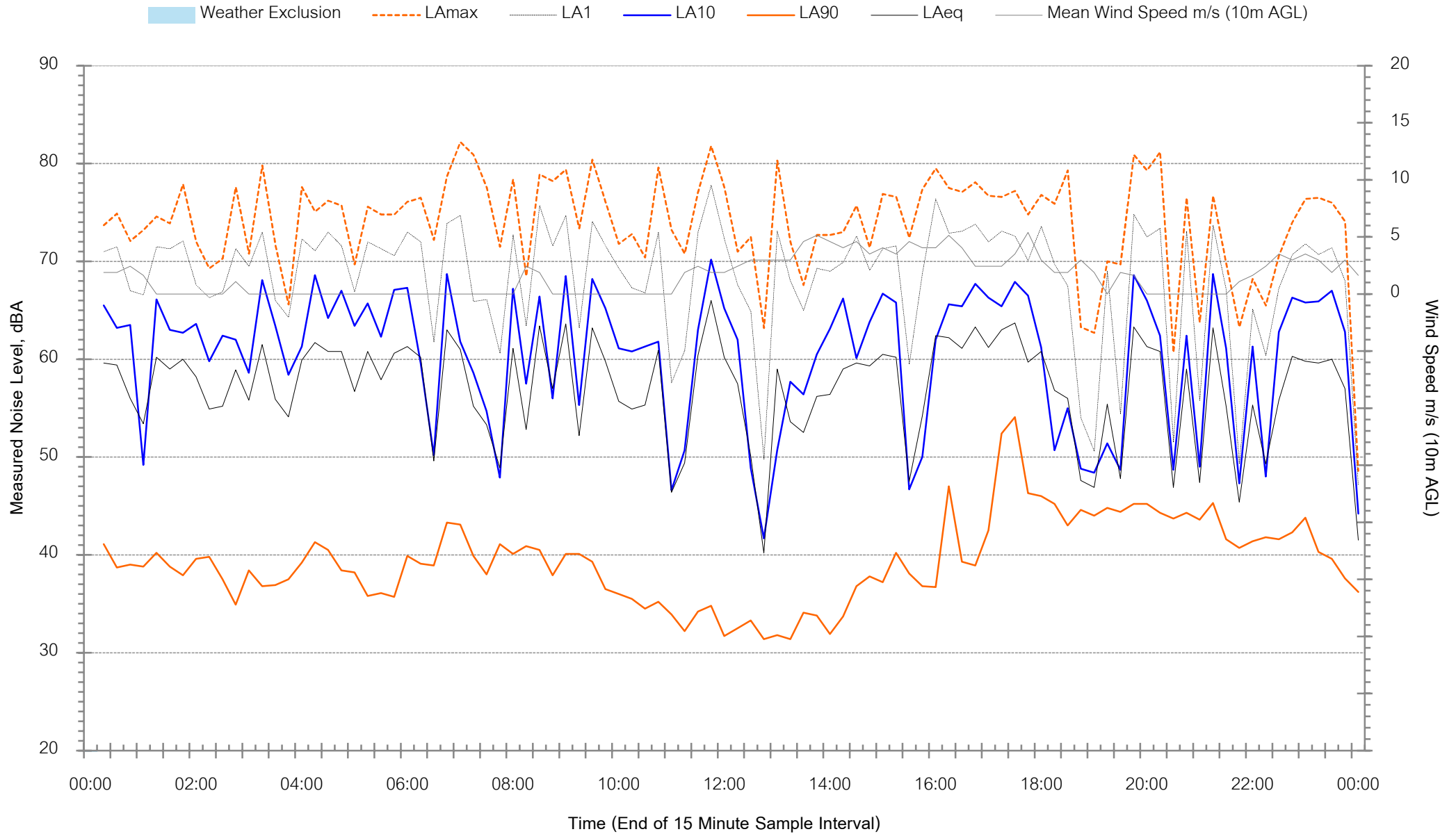
245 Station Lane, Lochinvar NSW - Thursday 9 May 2024





# Background Noise Levels

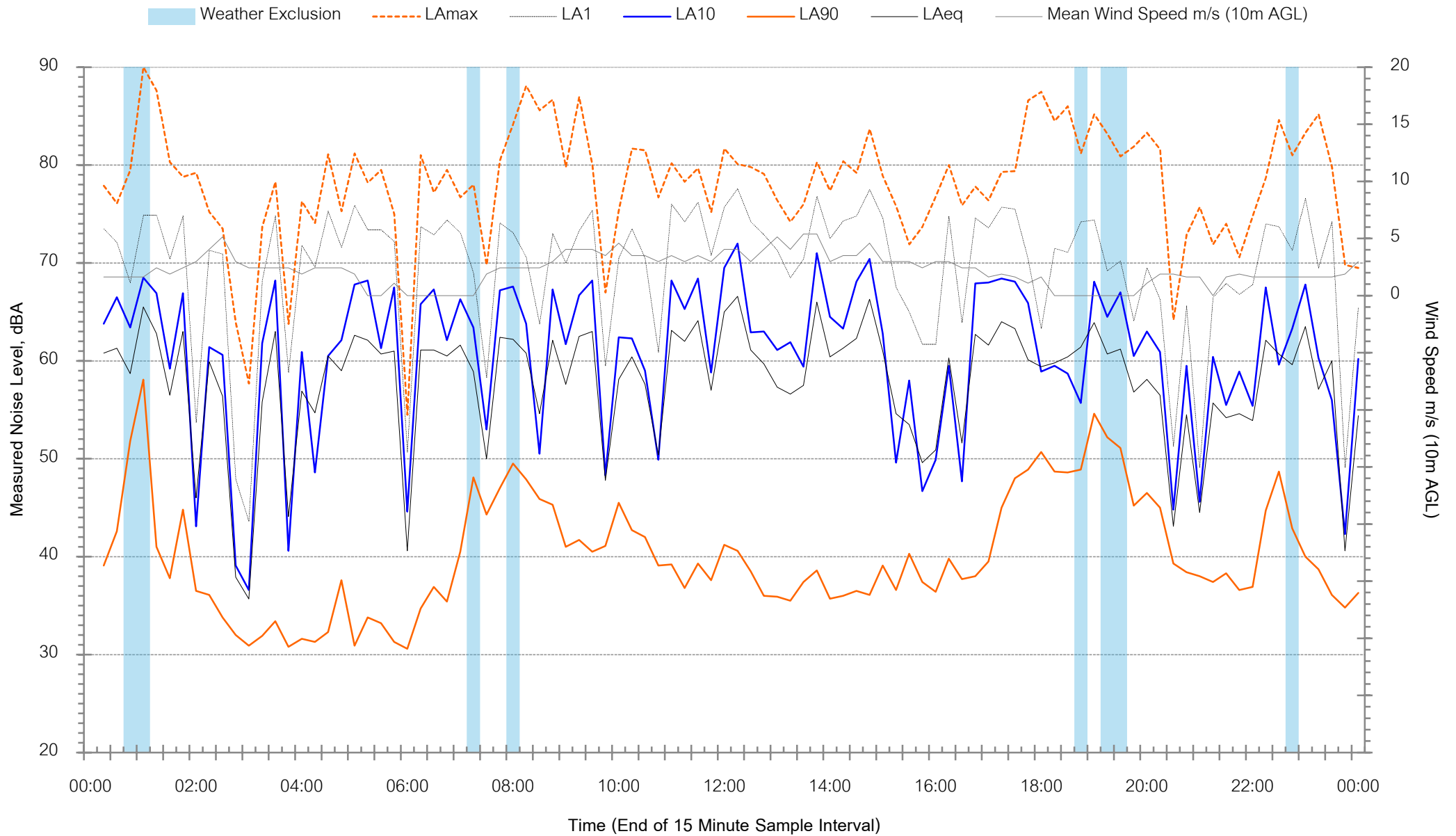
245 Station Lane, Lochinvar NSW - Friday 10 May 2024





# Background Noise Levels

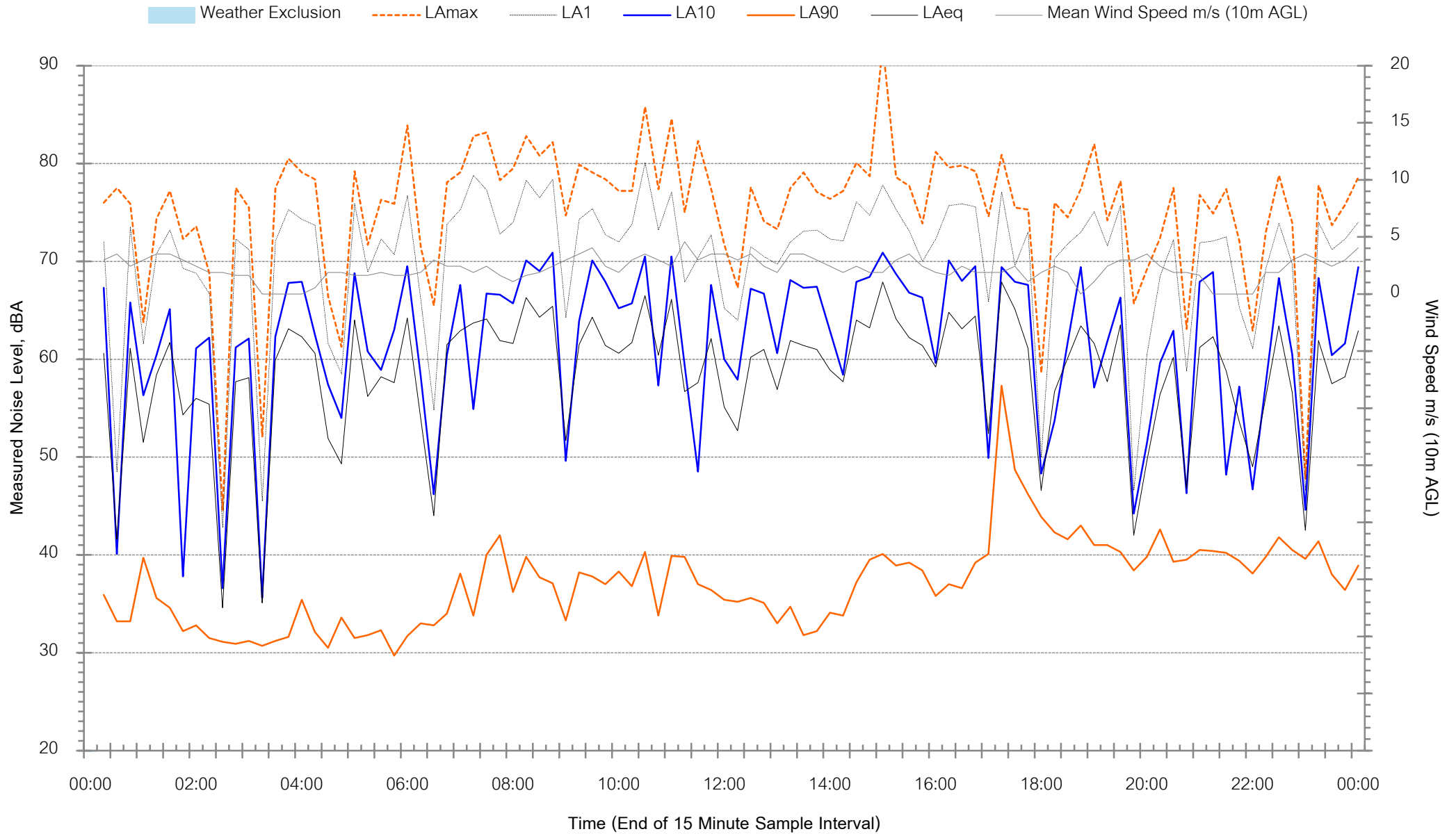
245 Station Lane, Lochinvar NSW - Saturday 11 May 2024





# Background Noise Levels

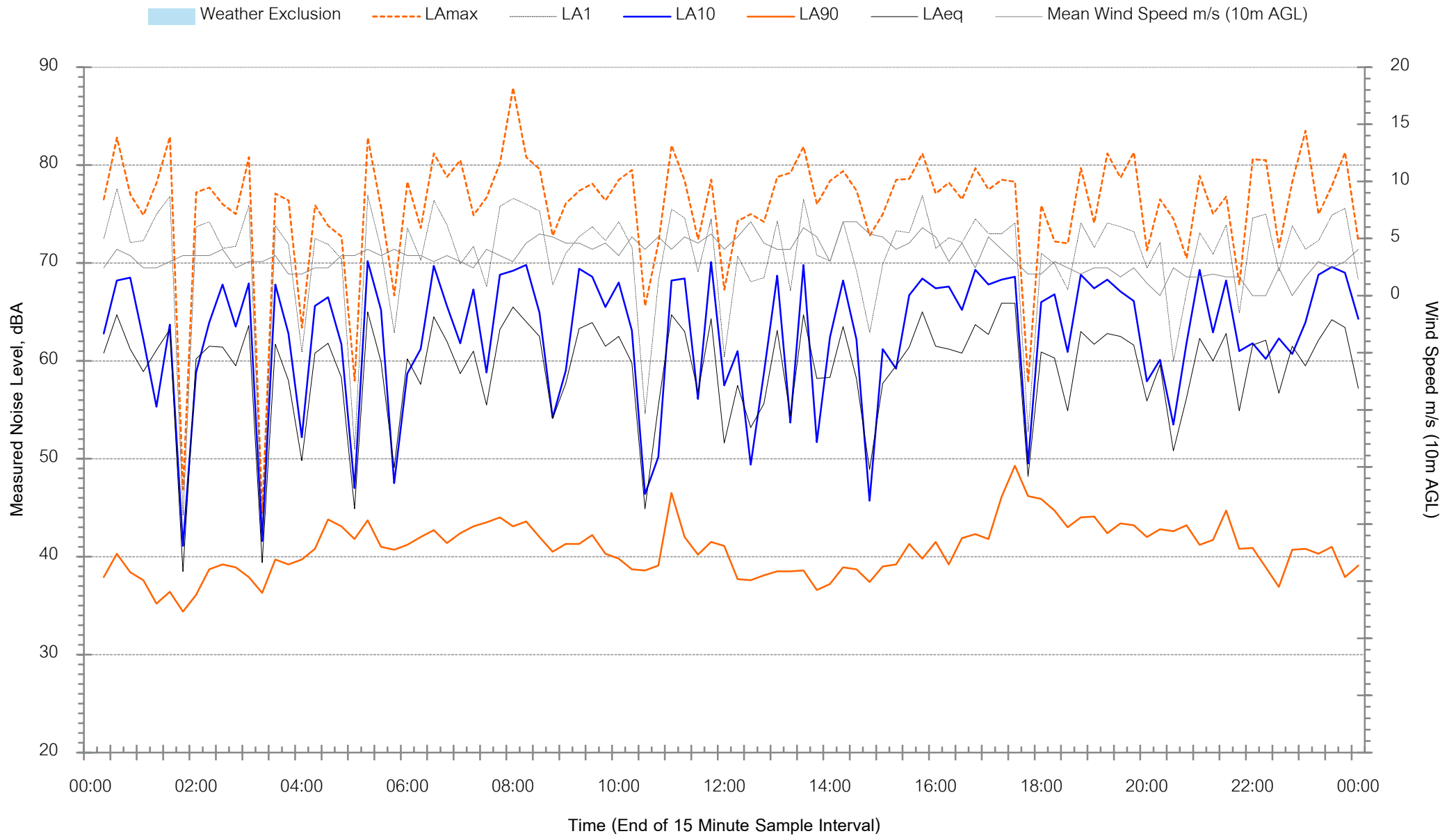
245 Station Lane, Lochinvar NSW - Sunday 12 May 2024





# Background Noise Levels

245 Station Lane, Lochinvar NSW - Monday 13 May 2024





# Background Noise Levels

245 Station Lane, Lochinvar NSW - Tuesday 14 May 2024

Weather Exclusion    LAmax    LA1    LA10    LA90    LAeq    Mean Wind Speed m/s (10m AGL)

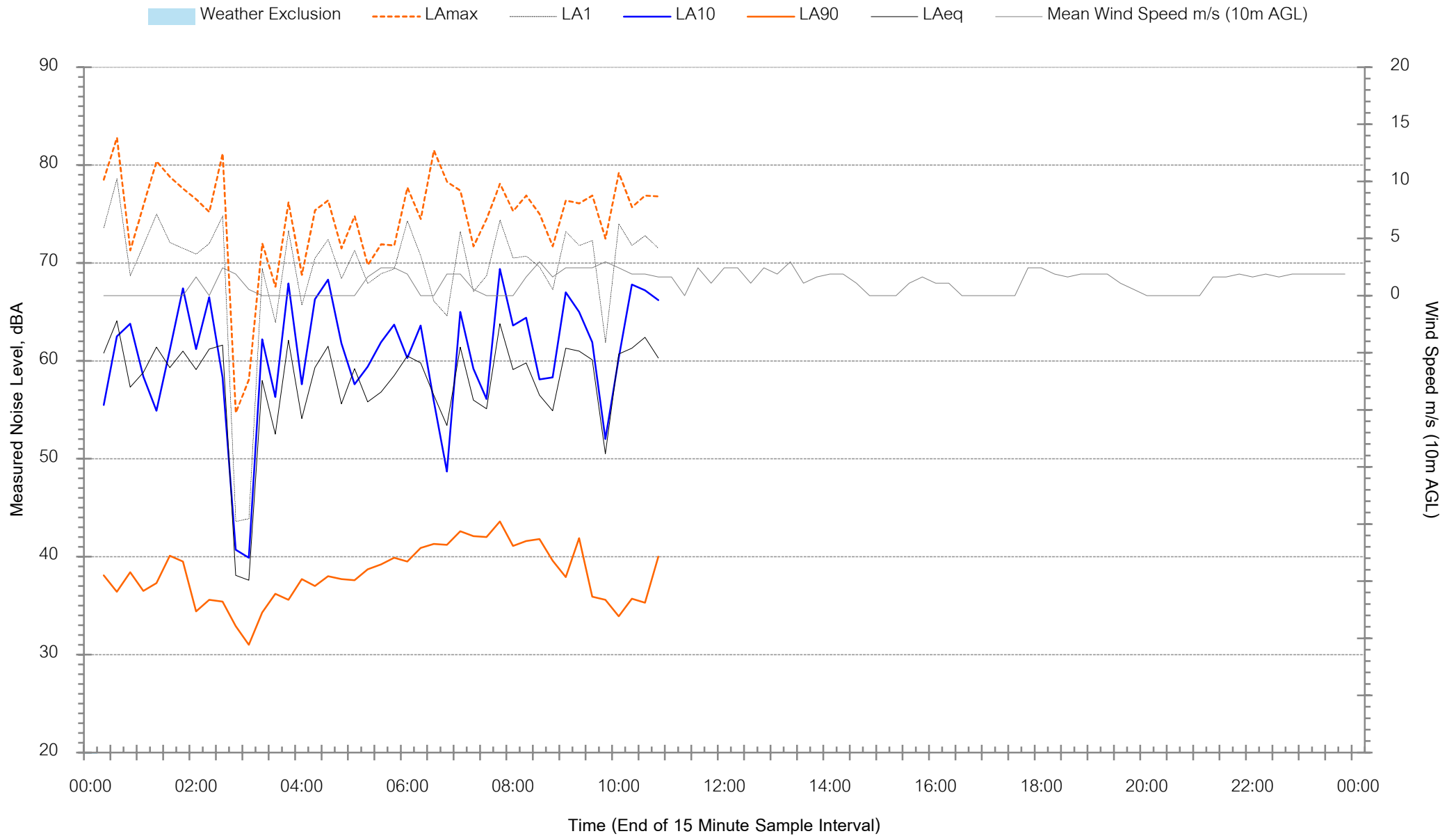






# Background Noise Levels

245 Station Lane, Lochinvar NSW - Wednesday 15 May 2024



*This page has been intentionally left blank*

# Appendix C – Project Plans

For HDB  
At Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Architectural Drawing Index

<u>Sheet Number</u>	<u>Rev</u>	<u>Sheet Name</u>
Ar01		Cover Sheet
Ar02		CH Ground Floor Plan
Ar03		CH Elevations
Ar04		CH Elevations
Ar05		CH Sections

Architectural Drawing Index

<u>Sheet Number</u>	<u>Rev</u>	<u>Sheet Name</u>
Ar06		3D Views
Ar07		Site Plan



Locality Plan



Area Plan



**PLAN VISION**

2 Lousia Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

Revision Schedule

Rev	Date	Description

**Client:**

HDB

**Address:**

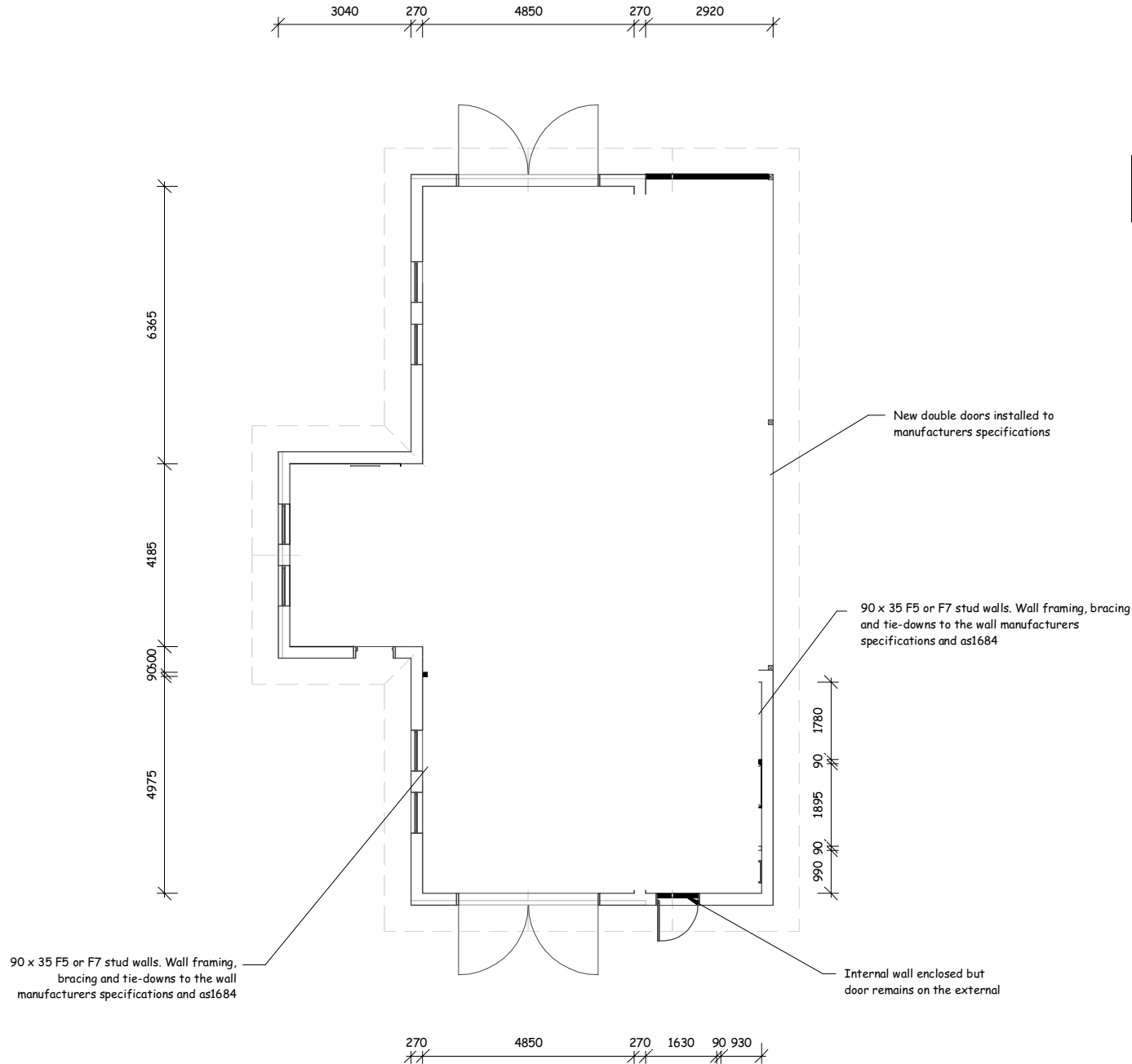
Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024

Drawing No: 524-8045

Sheet: Ar01

Scale: © A3



**General Notes**

1. Bracing and tie-down details to the engineers details and AS1684.2
2. All timber and steel to be installed and treated to the manufacturers specifications, especially for any exterior applications
3. All white ant protection to be strictly within the guidelines of AS3660 and installed by a qualified licenced pest control consultant
4. AJ denotes masonry articulation joint, to be installed to AS 3700 section 4.8 requirements

**Note:** boundaries to be pegged and setout confirmed before commencement of construction



**PLAN VISION**  
 2 Louisa Avenue, Cardiff  
 W/ (02) 40231266 M/ 0414 011 483

**BUILDERS NOTE:**  
 Use Dimensions in preference to scale. Site verify all dimensions before ordering Materials.  
 Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground. Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes.  
 Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary  
 Materials are under no circumstances to be ordered direct off Additions Plans.  
 Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list.  
 Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.  
 Wind Class: N2 (W33N) (Assumed)  
 Site Class: 'M' Soil Class: 'M'  
 Refer to Geotech report for more details

**SURVEY NOTE:**  
 Boundary dimensions are assumed only and taken from site information, others or owners information.  
 Confirm boundaries before commencement of construction.  
 Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes.  
 See schedule of specifications for details.

Revision Schedule		
Rev	Date	Description

**Client:**  
 HDB

**Address:**  
 Lot 80 - DP 1003006  
 245 Station Lane  
 LOCHINVAR

Date Started: 13/05/2024  
 Drawing No: 524-8045  
 Sheet: Ar02  
 Scale: 1 : 100 @ A3

**CH Ground Floor**  
 1 : 100



**PLAN VISION**

2 Louisa Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

**BUILDERS NOTE:**

Use Dimensions in preference to scale.  
Site verify all dimensions before ordering Materials.  
Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground. Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes.  
Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary  
Materials are under no circumstances to be ordered direct off Additions Plans.  
Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list.  
Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.

Wind Class: N2 (W33N) (Assumed)  
Site Class: 'M' Soil Class: 'M'  
Refer to Geotech report for more details

**SURVEY NOTE:**

Boundary dimensions are assumed only and taken from site information, others or owners information.  
Confirm boundaries before commencement of construction.  
Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes.  
See schedule of specifications for details.

**Revision Schedule**

Rev	Date	Description

**Client:**

HDB

**Address:**

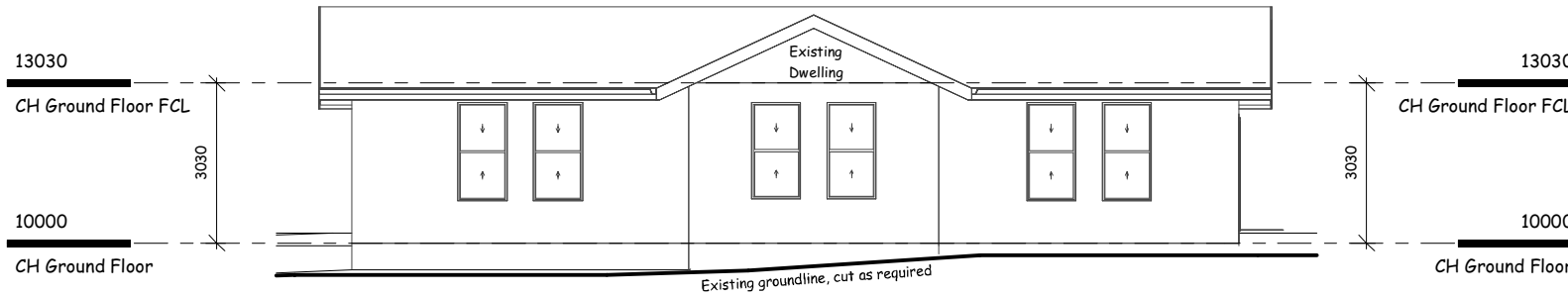
Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024

Drawing No: 524-8045

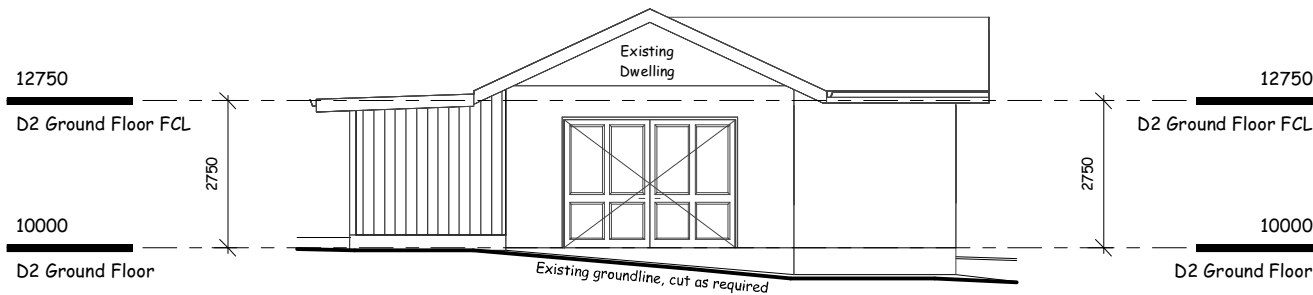
Sheet: Ar03

Scale: 1 : 100 @ A3



**CH North Elevation**

1 : 100



**CH East Elevation**

1 : 100



**PLAN VISION**

2 Louisa Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

**BUILDERS NOTE:**

Use Dimensions in preference to scale.  
Site verify all dimensions before ordering Materials.  
Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground. Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes.  
Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary  
Materials are under no circumstances to be ordered direct off Additions Plans.  
Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list.  
Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.

Wind Class: N2 (W33N) (Assumed)  
Site Class: 'M' Soil Class: 'M'  
Refer to Geotech report for more details

**SURVEY NOTE:**

Boundary dimensions are assumed only and taken from site information, others or owners information.  
Confirm boundaries before commencement of construction.  
Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes.  
See schedule of specifications for details.

**Revision Schedule**

Rev	Date	Description

**Client:**

HDB

**Address:**

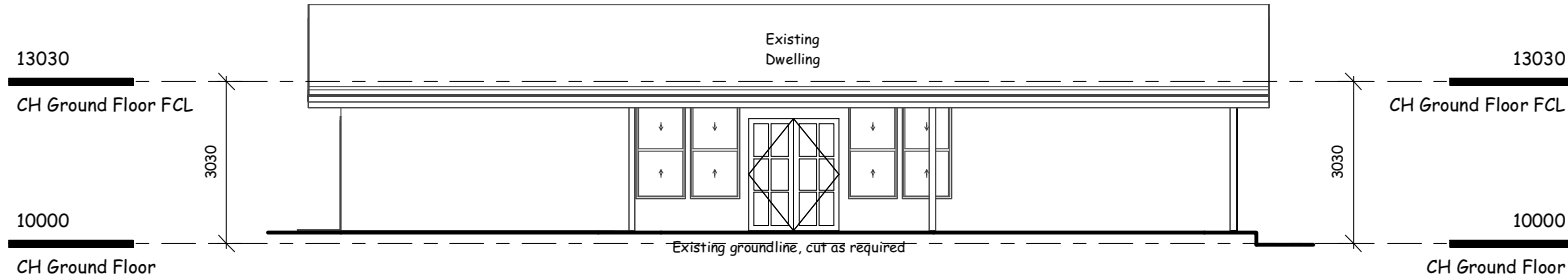
Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024

Drawing No: 524-8045

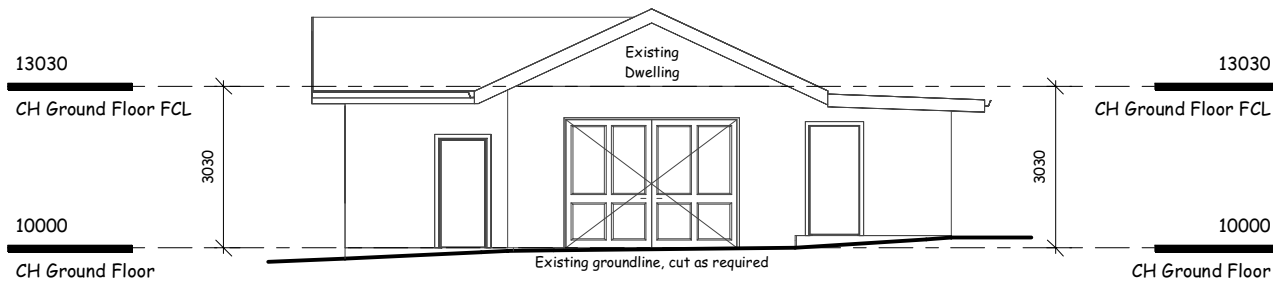
Sheet: Ar04

Scale: 1:100 @ A3



**CH South Elevation**

1:100



**CH West Elevation**

1:100



**PLAN VISION**

2 Louisa Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

**BUILDERS NOTE:**

Use Dimensions in preference to scale.  
Site verify all dimensions before ordering Materials.

Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground.

Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes.

Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary

Materials are under no circumstances to be ordered direct off Additions Plans.

Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list.

Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.

Wind Class: N2 (W33N) (Assumed)

Site Class: 'M' Soil Class: 'M'

Refer to Geotech report for more details

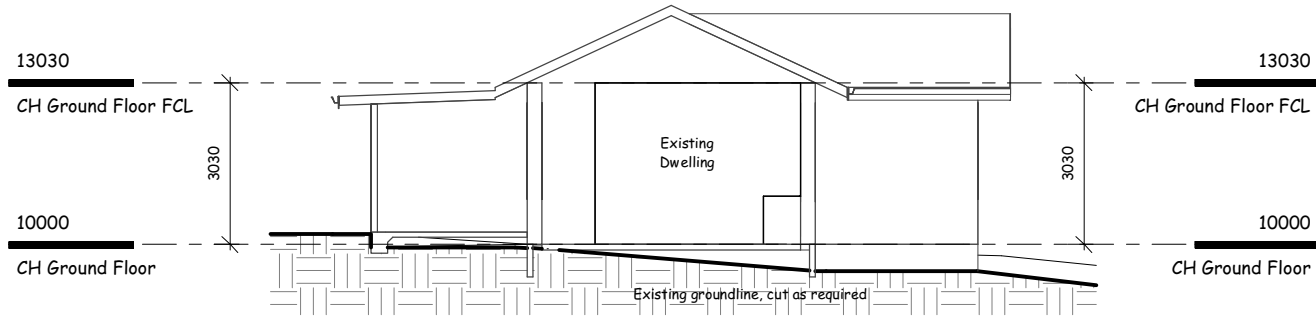
**SURVEY NOTE:**

Boundary dimensions are assumed only and taken from site information, others or owners information.

Confirm boundaries before commencement of construction.

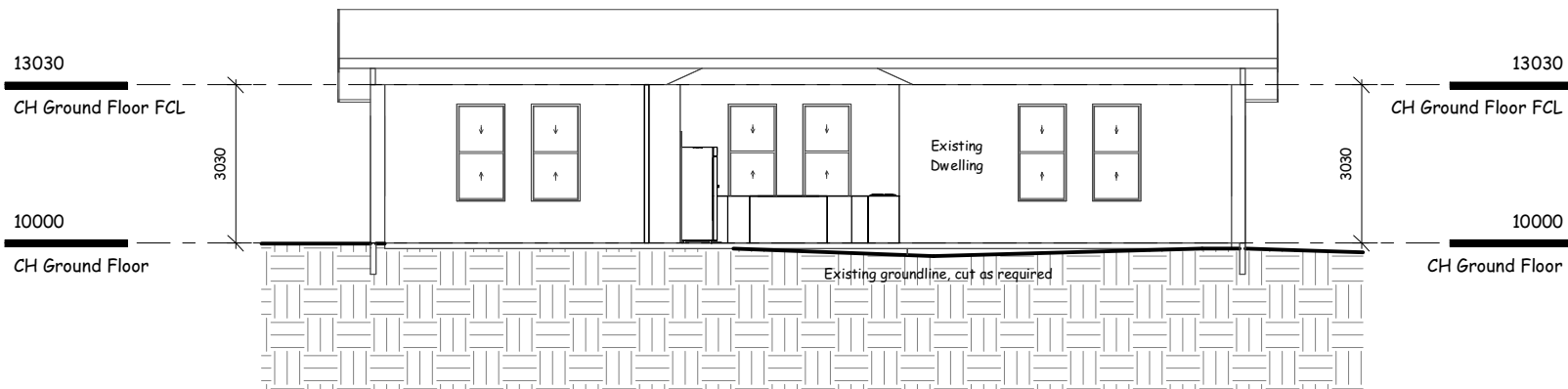
Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes.

See schedule of specifications for details.



Sec 1

1 : 100



Sec 2

1 : 100

**Revision Schedule**

Rev	Date	Description

**Client:**

HDB

**Address:**

Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024

Drawing No: 524-8045

Sheet: Ar05

Scale: 1 : 100 @ A3





**PLAN VISION**

2 Louisa Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

**BUILDERS NOTE:**

Use Dimensions in preference to scale.  
Site verify all dimensions before ordering Materials.

Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground. Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes.

Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary

Materials are under no circumstances to be ordered direct off Additions Plans.

Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list.

Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.

Wind Class: N2 (W33N) (Assumed)

Site Class: 'M' Soil Class: 'M'

Refer to Geotech report for more details

**SURVEY NOTE:**

Boundary dimensions are assumed only and taken from site information, others or owners information.

Confirm boundaries before commencement of construction.

Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes.

See schedule of specifications for details.

**Revision Schedule**

Rev	Date	Description

**Client:**

HDB

**Address:**

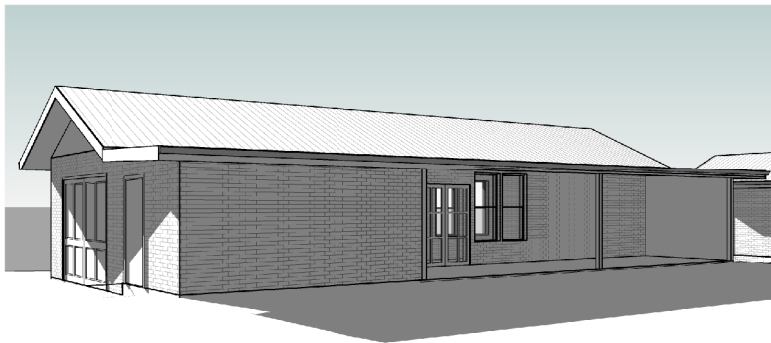
Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024

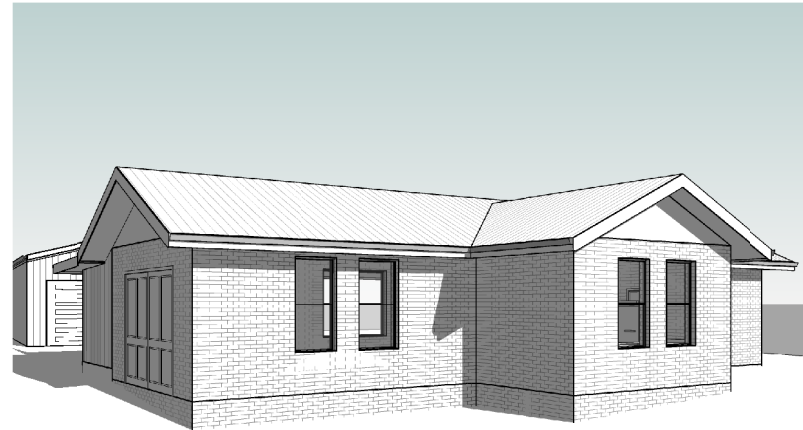
Drawing No: 524-8045

Sheet: Ar06

Scale: © A3



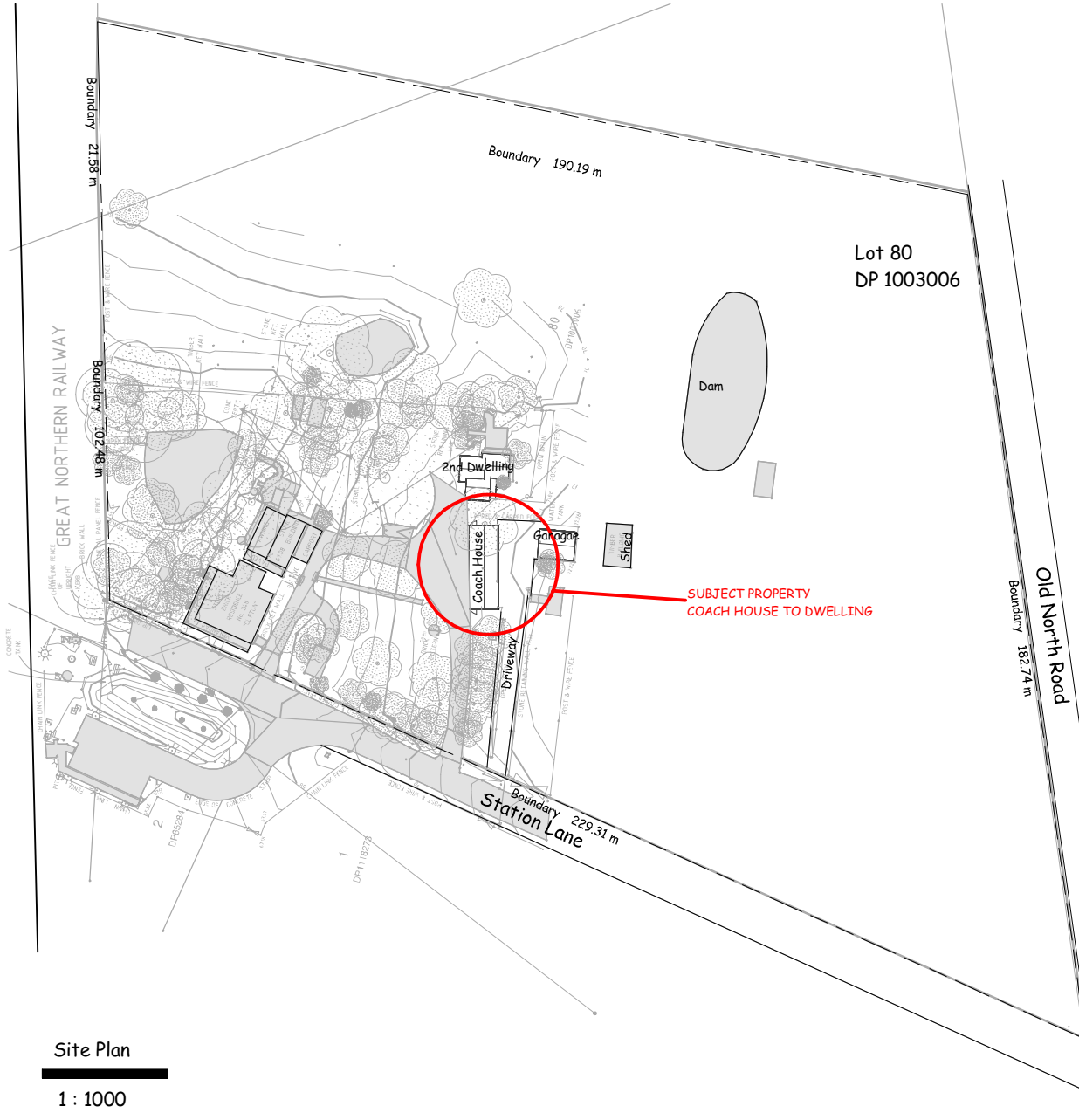
**3D View 1**



**3D View 2**



Note: boundaries to be pegged and setout confirmed before commencement of construction



Site Plan  
1 : 1000

**Erosion and Sediment Controls**

**General Notes**

- This plan shows the control objectives, philosophy and key control works for the site. The contractor shall provide supplementary works that reflect the adopted construction program and practices to ensure that erosion and sediment movement are managed in accordance with the objectives of this plan.
- Erosion and sediment hazard areas include stockpiles, exposed ground, embankments, cuttings concentrated flow paths and waterways.
- This plan is to be used as a guide only. The suitability of erosion and sediment control measures to be evaluated on site and where required, are to be modified under the supervision of a suitably qualified engineer and Council.

**Pre-Construction Phase Notes**

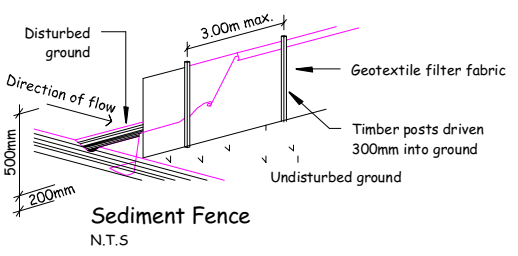
- Site works are not to start until the erosion and sediment control measures are installed and functional.
- Temporary sediment traps to be installed during construction (where applicable)
- Waste bins are to be provided for building waste or waste enclosure min. 1800 x 1800 x 1200mm high constructed using star pickets and 1200mm high weed control mat. Arrangement to be made for regular collection and disposal or recycling of construction waste.
- Entry and departure of vehicles is to be confined to the nominated existing vehicle access or stabilised site access. Sediment or barrier fencing will be used to restrict all vehicular movements to that access point. Stabilisation will be achieved by either:
  - constructing a sealed (eg concrete or asphalt) driveway to the street
  - constructing a stabilised site access according to Council's engineering standards.

**Construction Phase Notes**

- Topsoil is to be stripped from building site and stockpiled for later use in landscaping the site.
- The footpath and driveway, other than stabilised site access, is not to be disturbed, including stockpiling of materials. Where essential works (eg drainage) are required, the footpath is to be rehabilitated (turfed) as soon as possible.
- Where appropriate, an aggregate bag shall be placed in the gutter below the site access. The bag shall be made from green sediment fence material, or similar. The bag must be at least 450mm long, 200mm diameter, filled with less than 20mm blue metal or crushed rock. If the bag breaks or deteriorates, the bag shall be replaced immediately and the material cleaned out from any gutter, kerb, road surface or stormwater system it has entered. The use of hessian bags, and sand filled bags is not acceptable.
- All sedimentation controls are to be checked daily (at a min. weekly) and after all rain events. All structures to be cleaned on reaching 50% storage capacity to ensure they are maintained and in full functional condition. Excess materials and water from cleaning tools and equipment should not be washed down stormwater drains.

**Post-Construction Phase Notes:**

- Topsoil is to be re-spread and all disturbed areas rehabilitated (turfed) within 20 working days of completion of works. Where necessary, spray and seed disturbed areas.
- Roof downpipes to be connected to street kerb or other stormwater disposal system as nominated in the plans on completion of roof and guttering as soon as possible.



**PLAN VISION**  
2 Louisa Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

**BUILDERS NOTE:**  
Use Dimensions in preference to scale. Site verify all dimensions before ordering Materials.

Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground. Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes. Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary

Materials are under no circumstances to be ordered direct off Additions Plans. Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list. Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.

Wind Class: N2 (W33N) (Assumed)  
Site Class: 'M' Soil Class: 'M'  
Refer to Geotech report for more details

**SURVEY NOTE:**  
Boundary dimensions are assumed only and taken from site information, others or owners information. Confirm boundaries before commencement of construction. Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes. See schedule of specifications for details.

Revision Schedule		
Rev	Date	Description

**Client:**  
HDB

**Address:**  
Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024  
Drawing No: 524-8045  
Sheet: Ar07  
Scale: As indicated © A3

For HDB

At Lot 80 - DP 1003006

245 Station Lane

LOCHINVAR

Architectural Drawing Index

Sheet Number	Rev	Sheet Name
Ar01	A	Cover Sheet
Ar02	A	ET Ground Floor Plan
Ar03	A	ET Elevations
Ar04	A	ET Elevations
Ar05	A	ET Section

Architectural Drawing Index

Sheet Number	Rev	Sheet Name
Ar06	A	3D Views
Ar07	A	Site Plan



Locality Plan



Area Plan



**PLAN VISION**

21 Louis Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

Revision Schedule		
Rev	Date	Description
A	17/06/24	Orientation adjusted

**Client:**  
HDB

**Address:**  
Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024

Drawing No: 524-8045

Sheet: Ar01

Scale: © A3



**General Notes**

1. Bracing and tie-down details to the engineers details and AS1684.2
2. All timber and steel to be installed and treated to the manufacturers specifications, especially for any exterior applications
3. All white ant protection to be strictly within the guidelines of AS3660 and installed by a qualified licenced pest control consultant
4. AJ denotes masonry articulation joint, to be installed to AS 3700 section 4.8 requirements

Note: boundaries to be pegged and setout confirmed before commencement of construction



**PLAN VISION**

21. nisa Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

**BUILDERS NOTE:**

Use Dimensions in preference to scale.  
Site verify all dimensions before ordering Materials.  
Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground.  
Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes.  
Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary  
Materials are under no circumstances to be ordered direct off Additions Plans.  
Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list.  
Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.  
Wind Class: N2 (W33N) (Assumed)  
Site Class: 'M' Soil Class: 'M'  
Refer to Geotech report for more details

**SURVEY NOTE:**  
Boundary dimensions are assumed only and taken from site information, others or owners information.  
Confirm boundaries before commencement of construction.  
Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes.  
See schedule of specifications for details.



**Revision Schedule**

Rev	Date	Description
A	17/06/24	Orientation adjusted

**Client:**

HDB

**Address:**

Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024

Drawing No: 524-8045

Sheet: Ar02

Scale: 1:100 @ A3

Proposed Eco Tourism Floor

1 : 100



**PLAN VISION**

21 Llanisa Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

**BUILDERS NOTE:**

Use Dimensions in preference to scale.  
Site verify all dimensions before ordering Materials.

Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground. Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes.

Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary

Materials are under no circumstances to be ordered direct off Additions Plans.

Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list.

Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.

Wind Class: N2 (W33N) (Assumed)

Site Class: 'M' Soil Class: 'M'

Refer to Geotech report for more details

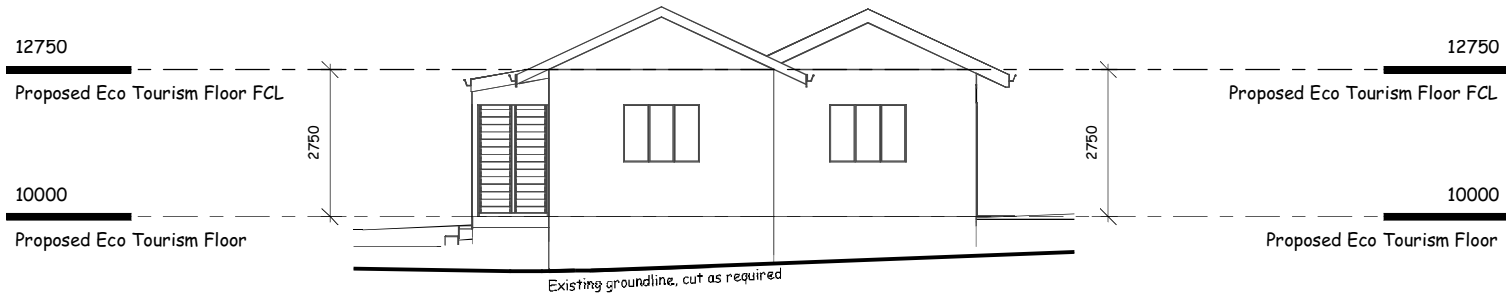
**SURVEY NOTE:**

Boundary dimensions are assumed only and taken from site information, others or owners information.

Confirm boundaries before commencement of construction.

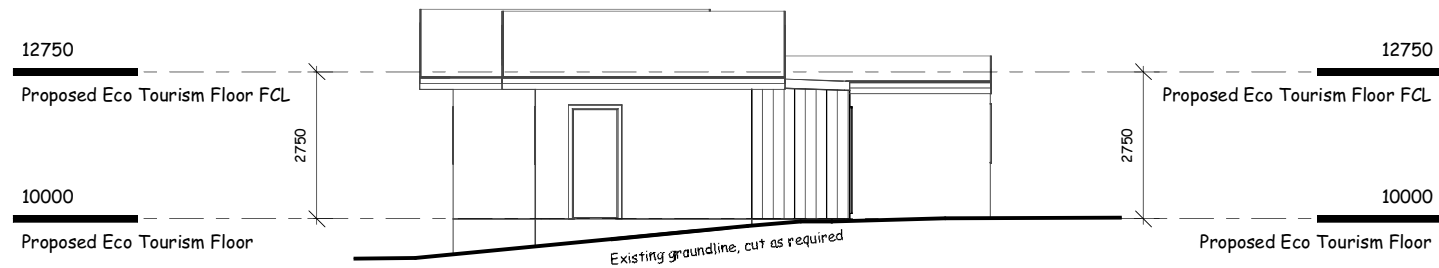
Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes.

See schedule of specifications for details.



**ET North Elevation**

1 : 100



**ET West Elevation**

1 : 100

**Revision Schedule**

Rev	Date	Description
A	17/06/24	Orientation adjusted

**Client:**

HDB

**Address:**

Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024

Drawing No: 524-8045

Sheet: Ar03

Scale: 1 : 100 @ A3



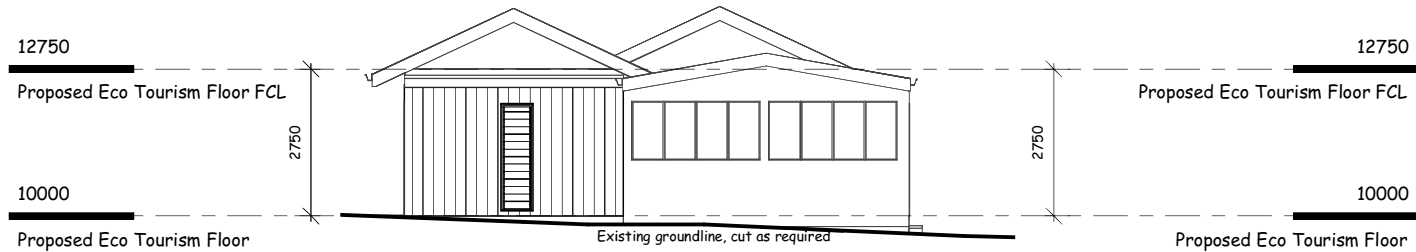
**PLAN VISION**

21. Missa Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

**BUILDERS NOTE:**

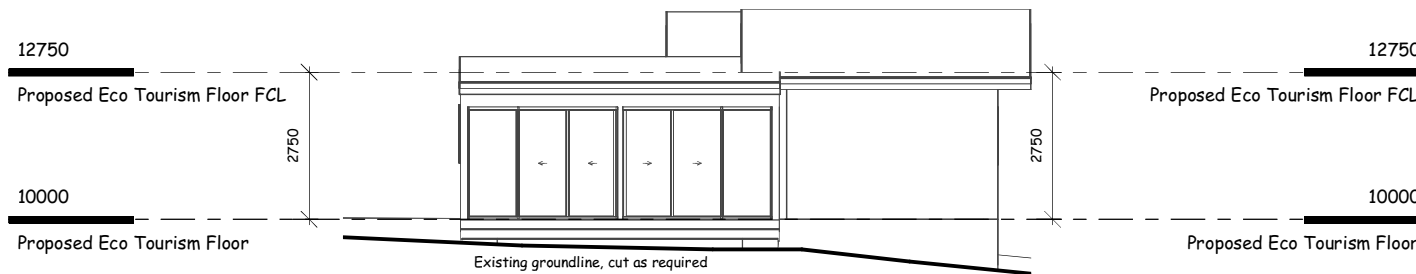
Use Dimensions in preference to scale.  
Site verify all dimensions before ordering Materials.  
Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground. Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes.  
Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary  
Materials are under no circumstances to be ordered direct off Additions Plans.  
Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list.  
Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.  
Wind Class: N2 (W33N) (Assumed)  
Site Class: 'M' Soil Class: 'M'  
Refer to Geotech report for more details

**SURVEY NOTE:**  
Boundary dimensions are assumed only and taken from site information, others or owners information.  
Confirm boundaries before commencement of construction.  
Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes.  
See schedule of specifications for details.



**ET South Elevation**

1 : 100



**ET East Elevation**

1 : 100

**Revision Schedule**

Rev	Date	Description
A	17/06/24	Orientation adjusted

**Client:**

HDB

**Address:**

Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024

Drawing No: 524-8045

Sheet: Ar04

Scale: 1 : 100 @ A3



**PLAN VISION**

21. Llanisa Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

**BUILDERS NOTE:**

Use Dimensions in preference to scale.  
Site verify all dimensions before ordering Materials.

Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground.

Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes.

Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary

Materials are under no circumstances to be ordered direct off Additions Plans.

Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list.

Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.

Wind Class: N2 (W33N) (Assumed)

Site Class: 'M' Soil Class: 'M'

Refer to Geotech report for more details

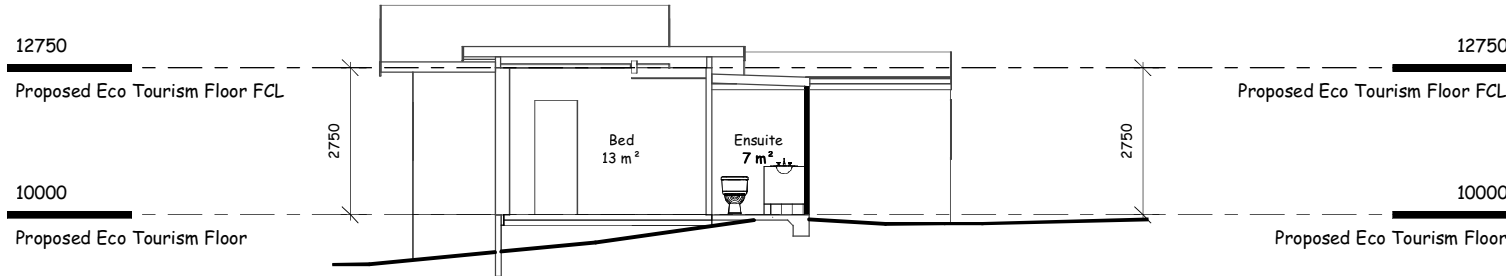
**SURVEY NOTE:**

Boundary dimensions are assumed only and taken from site information, others or owners information.

Confirm boundaries before commencement of construction.

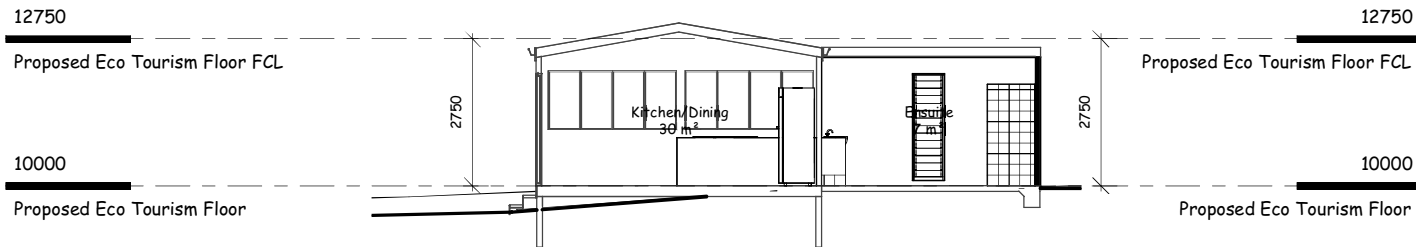
Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes.

See schedule of specifications for details.



**Section 1**

1 : 100



**Section 2**

1 : 100

**Revision Schedule**

Rev	Date	Description
A	17/06/24	Orientation adjusted

**Client:**

HDB

**Address:**

Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024

Drawing No: 524-8045

Sheet: Ar05

Scale: 1 : 100 @ A3



**PLAN VISION**

2 Louisa Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

**BUILDERS NOTE:**

Use Dimensions in preference to scale.  
Site verify all dimensions before ordering Materials.  
Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground. Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes.  
Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary  
Materials are under no circumstances to be ordered direct off Additions Plans.  
Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list.  
Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.

Wind Class: N2 (W33N) (A' Assumed)  
Site Class: 'M' Soil Class: 'M'  
Refer to Geotech report for more details

**SURVEY NOTE:**

Boundary dimensions are assumed only and taken from site information, others or owners information.  
Confirm boundaries before commencement of construction.  
Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes.  
See schedule of specifications for details.

**Revision Schedule**

Rev	Date	Description
A	17/06/24	Orientation adjusted

**Client:**

HDB

**Address:**

Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024

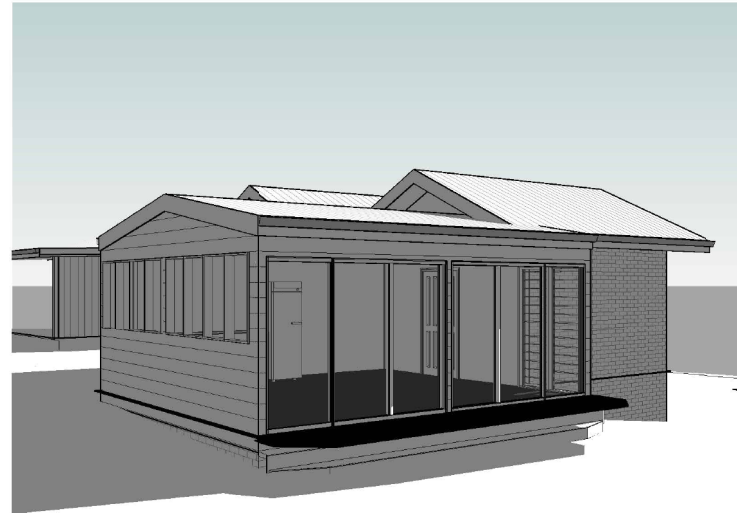
Drawing No: 524-8045

Sheet: Ar06

Scale: © A3



**3D View 4**

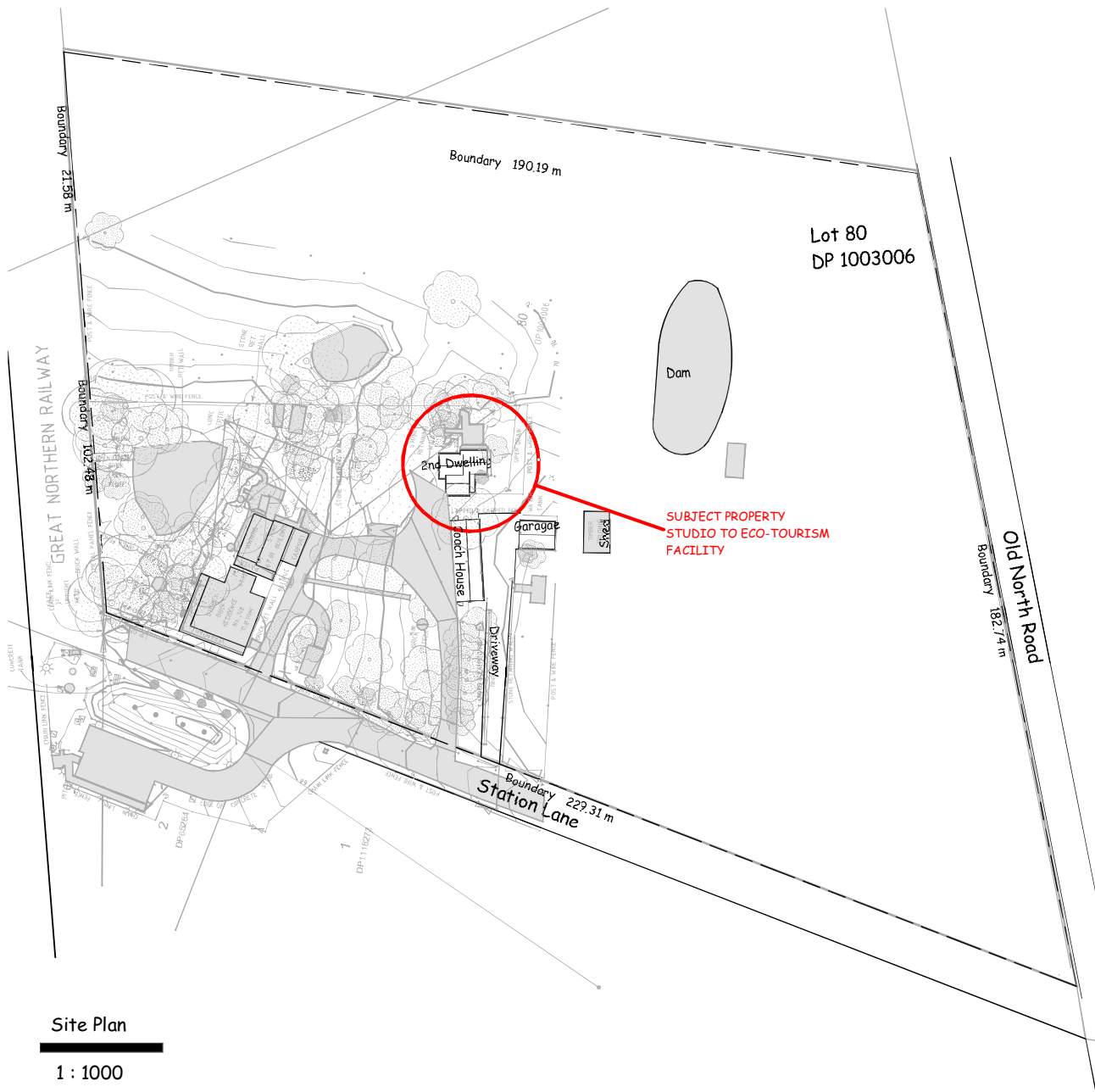


**3D View 3**





Note: boundaries to be pegged and setout confirmed before commencement of construction



Site Plan  
1 : 1000

**Erosion and Sediment Controls**

**General Notes**

- This plan shows the control objectives, philosophy and key control works for the site. The contractor shall provide supplementary works that reflect the adopted construction program and practices to ensure that erosion and sediment movement are managed in accordance with the objectives of this plan.
- Erosion and sediment hazard areas include stockpiles, exposed ground, embankments, cuttings concentrated flow paths and waterways.
- This plan is to be used as a guide only. The suitability of erosion and sediment control measures to be evaluated on site and where required, are to be modified under the supervision of a suitably qualified engineer and Council.

**Pre-Construction Phase Notes**

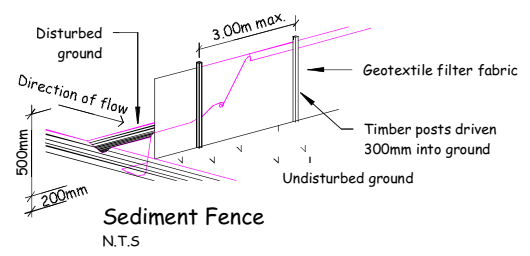
- Site works are not to start until the erosion and sediment control measures are installed and functional.
- Temporary sediment traps to be installed during construction (where applicable)
- Waste bins are to be provided for building waste or waste enclosure min. 1800 x 1800 x 1200mm high constructed using star pickets and 1200mm high weed control mat. Arrangement to be made for regular collection and disposal or recycling of construction waste.
- Entry and departure of vehicles is to be confined to the nominated existing vehicle access or stabilised site access. Sediment or barrier fencing will be used to restrict all vehicular movements to that access point. Stabilisation will be achieved by either:
  - constructing a sealed (eg concrete or asphalt) driveway to the street
  - constructing a stabilised site access according to Council's engineering standards.

**Construction Phase Notes**

- Topsoil is to be stripped from building site and stockpiled for later use in landscaping the site.
- The footpath and driveway, other than stabilised site access, is not to be disturbed, including stockpiling of materials. Where essential works (eg drainage) are required, the footpath is to be rehabilitated (turfed) as soon as possible.
- Where appropriate, an aggregate bag shall be placed in the gutter below the site access. The bag shall be made from green sediment fence material, or similar. The bag must be at least 450mm long, 200mm diameter, filled with less than 20mm blue metal or crushed rock. If the bag breaks or deteriorates, the bag shall be replaced immediately and the material cleaned out from any gutter, kerb, road surface or stormwater system it has entered. The use of hessian bags, and sand filled bags is not acceptable.
- All sedimentation controls are to be checked daily (at a min. weekly) and after all rain events. All structures to be cleaned on reaching 50% storage capacity to ensure they are maintained and in full functional condition. Excess materials and water from cleaning tools and equipment should not be washed down stormwater drains.

**Post-Construction Phase Notes:**

- Topsoil is to be re-spread and all disturbed areas rehabilitated (turfed) within 20 working days of completion of works. Where necessary, spray and seed disturbed areas.
- Roof downpipes to be connected to street kerb or other stormwater disposal system as nominated in the plans on completion of roof and guttering as soon as possible.



21, Missa Avenue, Cardiff  
W/ (02) 40231266 M/ 0414 011 483

**BUILDERS NOTE:**

Use Dimensions in preference to scale.  
Site verify all dimensions before ordering Materials.  
Footings information shown on these plans may have to be changed if Builders site excavations reveal non-virgin ground.  
Consultation of Plan Vision Australia Pty Ltd would then be necessary to determine the required changes.  
Builder to inspect adequacy of existing footings & piers for proposed scope of works. Replace existing footings & sub floor members as necessary  
Materials are under no circumstances to be ordered direct off Additions Plans.  
Materials to be ordered are only to be ordered from a Builders or applicable product manufacturers separate site confirmed Materials list.  
Additions plans are not intended to be the absolute medium for construction information accuracy due to existing buildings discrepancies and existing buildings hidden characteristics. See schedule of specifications for further details.  
Wind Class: N2 (W33N) (Assumed)  
Site Class: 'M' Soil Class: 'M'  
Refer to Geotech report for more details  
**SURVEY NOTE:**  
Boundary dimensions are assumed only and taken from site information, others or owners information.  
Confirm boundaries before commencement of construction.  
Full project specific detailed survey plans have not been supplied to Plan Vision for planning purposes.  
See schedule of specifications for details.

**Revision Schedule**

Rev	Date	Description
A	17/06/24	Orientation adjusted

**Client:**  
HDB

**Address:**  
Lot 80 - DP 1003006  
245 Station Lane  
LOCHINVAR

Date Started: 13/05/2024  
Drawing No: 524-8045  
Sheet: Ar07  
Scale: As indicated @ A3

*This page has been intentionally left blank*

# Appendix D – Acoustic Performance of Building Elements

# Appendix C – Acoustic Treatment of Residences



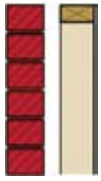

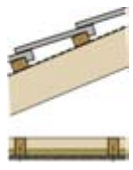

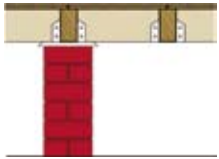

The following table sets out standard (or deemed-to-satisfy) constructions for each category of noise control treatment for the sleeping areas and other habitable areas of single / dual occupancy residential developments only. The assumptions made in the noise modelling are as follows:


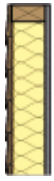


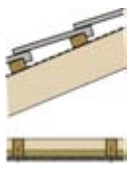

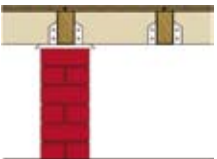

- Typical layout of a modern dwelling taken from a recent large residential development in an outer Sydney suburb
- Bedrooms and other habitable rooms are exposed to road noise




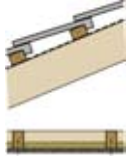


## ACOUSTIC PERFORMANCE OF BUILDING ELEMENTS




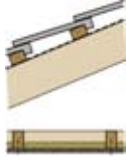


The acoustic performances assumed of each building element in deriving the Standard Constructions for each category of noise control treatment presented in the preceding Table, are presented below in terms of Weighted Sound Reduction Index ( $R_w$ ) values, which can be used to find alternatives to the standard constructions presented in this Appendix:

Category of Noise Control Treatment	$R_w$ of Building Elements (minimum assumed)				
	Windows/Sliding Doors	Frontage Facade	Roof	Entry Door	Floor
Category 1	24	38	40	28	29
Category 2	27	45	43	30	29
Category 3	32	52	48	33	50
Category 4	35	55	52	33	50
Category 5	43	55	55	40	50



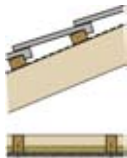

Category No.	Building Element	Standard Constructions	sample
1	Windows/Sliding Doors	Openable with minimum 4mm monolithic glass and standard weather seals	
	Frontage Facade	<b>Timber Frame or Cladding:</b> 6mm fibre cement sheeting or weatherboards or plank cladding externally, 90mm deep timber stud or 92mm metal stud, 13mm standard plasterboard internally	
		<b>Brick Veneer:</b> 110mm brick, 90mm timber stud or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally	
		<b>Double Brick Cavity:</b> 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or metal sheet roof with sarking, 10mm plasterboard ceiling fixed to ceiling joists, R1.5 insulation batts in roof cavity.	
	Entry Door	35mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	1 layer of 19mm structural floor boards, timber joist on piers	
Concrete slab floor on ground			

Category No.	Building Element	Standard Constructions	sample
2	Windows/Sliding Doors	Openable with minimum 6mm monolithic glass and full perimeter acoustic seals	
	Frontage Facade	<b>Timber Frame or Cladding Construction:</b> 6mm fibre cement sheeting or weatherboards or plank cladding externally, 90mm deep timber stud or 92mm metal stud, 13mm standard plasterboard internally with R2 insulation in wall cavity.	
		<b>Brick Veneer Construction:</b> 110mm brick, 90mm timber stud frame or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally.	
		<b>Double Brick Cavity Construction:</b> 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or metal sheet roof with sarking, 10mm plasterboard ceiling fixed to ceiling joists, R2 insulation batts in roof cavity.	
	Entry Door	40mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	1 layer of 19mm structural floor boards, timber joist on piers	
Concrete slab floor on ground			

Category No.	Building Element	Standard Constructions	sample
3	Windows/Sliding Doors	Openable with minimum 6.38mm laminated glass and full perimeter acoustic seals	
	Frontage Facade	<b>Brick Veneer Construction:</b> 110mm brick, 90mm timber stud or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, 10mm standard plasterboard internally.	
		<b>Double Brick Cavity Construction:</b> 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or sheet metal roof with sarking, 1 layer of 13mm sound-rated plasterboard fixed to ceiling joists, R2 insulation batts in roof cavity.	
	Entry Door	45mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	Concrete slab floor on ground	

Category No.	Building Element	Standard Constructions	sample
4	Windows/Sliding Doors	Openable with minimum 10.38mm laminated glass and full perimeter acoustic seals	
	Frontage Facade	<b>Brick Veneer Construction:</b> 110mm brick, 90mm timber stud or 92mm metal stud, minimum 50mm clearance between masonry and stud frame, R2 insulation batts in wall cavity, 10mm standard plasterboard internally.	
		<b>Double Brick Cavity Construction:</b> 2 leaves of 110mm brickwork separated by 50mm gap	
	Roof	Pitched concrete or terracotta tile or sheet metal roof with sarking, 2 layers of 10mm sound-rated plasterboard fixed to ceiling joists, R2 insulation batts in roof cavity.	
	Entry Door	45mm solid core timber door fitted with full perimeter acoustic seals	
	Floor	Concrete slab floor on ground	



Category No.	Building Element	Standard Constructions	sample
5	Windows/Sliding Doors	Openable Double Glazing with separate panes: 5mm monolithic glass, 100mm air gap, 5mm monolithic glass with full perimeter acoustic seals.	
	Frontage Facade	<b>Double Brick Cavity Construction:</b> 2 leaves of 110mm brickwork separated by 50mm gap with cement render to the external face of the wall and cement render or 13mm plasterboard direct fixed to internal faces of the wall.	
	Roof	Pitched concrete or terracotta tile or sheet metal roof with sarking, 2 layers of 10mm sound-rated plasterboard fixed to ceiling joist using resilient mounts, R2 insulation batts in roof cavity	
	Entry Door	Special high performance acoustic door required - Consult an Acoustic Engineer	<i>Door to acoustic consultant's specifications</i>
	Floor	Concrete slab floor on ground	
6	All	Consult an Acoustic Engineer	

Muller Acoustic Consulting Pty Ltd

PO Box 678, Kotara NSW 2289

ABN: 36 602 225 132

Ph: +61 2 4920 1833

[www.mulleracoustic.com](http://www.mulleracoustic.com)

