Noise Impact Assessment by Muller Acoustic Consulting

Appendix D

pitt&sherry

Noise Impact Assessment

Muswellbrook Animal Boarding Establishment
127-129 Sydney Street
Muswellbrook, NSW.

Prepared for: Pitt&Sherry Operations Pty Ltd
May 2020
MAC191011-01RP1

MAC
Muller Acoustic Consulting

Document Information

Noise Impact Assessment

Muswellbrook Animal Boarding Establishment

127-129 Sydney Street, Muswellbrook, NSW.

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Pitt&Sherry Operations Pty Ltd (P&S) on behalf of Muswellbrook Shire Council to prepare a Noise Impact Assessment (NIA) to quantify potential noise emissions associated with the proposed Muswellbrook Animal Boarding Establishment (the 'project') to be located at 127-129 Sydney Street, Muswellbrook, NSW.

The Noise Impact Assessment has been prepared to accompany the Development Application for the project and quantifies noise emissions from the project to surrounding receivers.

This assessment has been completed in accordance with the following policies and guidelines:

- NSW Environment Protection Authority (EPA), Noise Guide for Local Government (NGLG) 2013;
- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI) 2017;
- Australian Standard AS 1055:2018 - Acoustics - Description and measurement of environmental noise - General Procedures;
- Association of Australasian Acoustical Consultants (AAAC) - Consultants Guideline for Report Writing, 2017; and
- International Standard ISO 9613:1993 - Acoustics - Attenuation of sound during propagation outdoors.

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

1.1 Project Background

MAC understands that Muswellbrook Shire Council propose to construct a multi-purpose Animal Boarding Establishment (ABE) to replace the existing facility. The project site is located at 127-129 Sydney Street, Muswellbrook, NSW (Lot 2 of DP1243931), approximately 1km southwest of the Muswellbrook Town Centre.

The multi-purpose facility would comprise the ABE itself, deposit pens, adoption and private boarding kennels, seized and stray animal kennels, a dog park, nursery, BBQ / outdoor area and sustainability hub with community garden. It is anticipated that the facility will take 9 months to construct with the main buildings consisting of core filled blocks or straw bale lined with metal sheeting. The proposed hours of the ABE are 9:00am to 5:00pm daily, with the exercise yards utilised from 9:00am to 3:30pm, however it is anticipated the ABE will have limited operations 24 hours a day with small numbers of staff onsite caring for the boarding animals during the night period.

1.2 Receiver Review

A review of receivers in close proximity to the project has been completed and are summarised in **Table 1. Figure 1** and **Figure 2** provides locality plans showing the position of these receivers in relation to the project. All receiver heights were set to 1.5m above relative ground level for ground floor receivers.

Table 1 Receiver Locations

Receiver	MGA56 Coordinates		Receiver Height	Receiver Type
R1	300506	6427651	1.5m	Residential
R2	300534	6427643	1.5m	Residential
R3	300554	6427619	1.5m	Residential
R4	300537	6427614	1.5m	Residential
R5	300523	6427607	1.5m	Residential
R6	300511	6427596	1.5m	Residential
R7	300503	6427579	1.5m	Residential
R8	300483	6427567	1.5m	Residential
R9	300477	6427559	1.5m	Residential
R10	300497	6427504	1.5m	Residential
R11	300481	6427492	1.5m	Residential
R12	300467	6427483	1.5m	Residential
R13	300453	6427470	1.5m	Residential
R14	300439	6427462	1.5m	Residential
R15	300425	6427450	1.5m	Residential
R16	300395	6427422	1.5m	Residential
R17	300372	6427408	1.5m	Residential
R18	300359	6427400	1.5m	Residential
R19	300345	6427387	1.5m	Residential
R20	300329	6427375	1.5m	Residential
R21	300314	6427362	1.5m	Residential
R22	300304	6427353	1.5m	Residential
R23	300285	6427342	1.5m	Residential
R24	300273	6427331	1.5m	Residential
R25	299396	6426895	1.5m	Residential
R26	298775	6427317	1.5m	Residential
R27	299053	6427357	1.5m	Residential
R28	299176	6427648	1.5m	Residential
R29	299852	6428101	1.5m	Residential
R30	300495	6428158	1.5m	Residential
AR1	300170	6427508	1.5m	Active Recreational
C1	300447	6427552	1.5m	Commercial

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*Imagery Source : nearmaps

FIGURE 1
LOCALITY PLAN
REF: MAC191011

0 100m

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*Imagery Source : nearmaps

FIGURE 2

LOCALITY PLAN

REF: MAC191011

0 100m

2 Noise Policy and Guidelines

2.1 Noise Guide for Local Government

The NSW EPA Noise Guide for Local Government (NGLG) provides practical guidance for local council officers in the day-to-day management of local noise problems and in the interpretation of existing policy and legislation. The aim of the NGLG is to help councils assess, manage and regulate noise issues. The NGLG is advisory in nature, and council officers are encouraged to use it to develop council procedures or policy to deal with noise issues relevant to local circumstances.

Table 1.3 of the NGLG outlines that dog kennel noise is the responsibility of both the local council and the NSW police force, however also states that although the police can issue a noise abatement direction, it is typically local councils responsibility to address these matters. As noise emissions emanating from kennels are typically ongoing in nature, are best resolved through consultations with the owners/operators. Table 1.3 of the NGLG outlines that noise from dog kennels is to be assessed utilising the "Offensive Noise Test".

Part 2 of the NGLG details the noise assessment process, being an examination of the nature and characteristics of a noise and can involve verifying aural factors such as:

- the location of the noise source;
- its audibility at certain locations;
- the time the noise is made and its duration;
- its characteristics; and
- the reported effect it has on people.

This NGLG discusses how an authorised person can judge whether a noise is audible, excessively long in duration, or offensive, as defined by the legislation. It also outlines the techniques for measuring noise where this is desirable or necessary to support decision-making.

2.2 Noise Goals for Planning

The NGLG is underpinned by the NSW Noise Policy for Industry (NPI). There are two criteria to consider when establishing noise assessment criteria/goals which the NPI defines as Project Noise Trigger Levels (PNTLs). These criteria are:

- the project intrusiveness noise level, which is based on the background noise level plus 5dB and seeks to limit the degree of change a new noise source introduces to an existing environment; and
- the project amenity noise level, is relevant to a specific land use or locality to limit continuing increases in intrusiveness levels. The ambient noise level within an area from all combined industrial sources should remain below the recommended amenity noise levels specified in Table 2.2 (of the NPI).

2.3 Noise Policy for Industry

The EPA released the Noise Policy for Industry (NPI) in October 2017 which provides a process for establishing noise criteria for consents and licenses enabling the EPA to regulate noise emissions from scheduled premises under the Protection of the Environment Operations Act 1997.

The objectives of the NPI are to:

- provide noise criteria that is used to assess the change in both short term and long-term noise levels;
- provide a clear and consistent framework for assessing environmental noise impacts from industrial premises and industrial development proposals;
- promote the use of best-practice noise mitigation measures that are feasible and reasonable where potential impacts have been identified; and
- support a process to guide the determination of achievable noise limits for planning approvals and/or licences, considering the matters that must be considered under the relevant legislation (such as the economic and social benefits and impacts of industrial development).

The policy sets out a process for industrial noise management involving the following key steps:

1. Determine the Project Noise Trigger Levels (PNTLs) (ie criteria) for a development. These are the levels (criteria), above which noise management measures are required to be considered. They are derived by considering two factors: shorter-term intrusiveness due to changes in the noise environment; and maintaining the noise amenity of an area.

2. Predict or measure the noise levels produced by the development with regard to the presence of annoying noise characteristics and meteorological effects such as temperature inversions and wind.

3. Compare the predicted or measured noise level with the PNTL, assessing impacts and the need for noise mitigation and management measures.

4. Consider residual noise impacts - that is, where noise levels exceed the PNTLs after the application of feasible and reasonable noise mitigation measures. This may involve balancing economic, social and environmental costs and benefits from the proposed development against the noise impacts, including consultation with the affected community where impacts are expected to be significant.

5. Set statutory compliance levels that reflect the best achievable and agreed noise limits for the development.

6. Monitor and report environmental noise levels from the development.

2.3.1 Project Noise Trigger Levels

The policy sets out the procedure to determine the PNTLs relevant to an industrial development. The PNTL is the lower (ie, the more stringent) of the **Project Intrusiveness Noise Level** (PINL) and **Project Amenity Noise Level** (PANL) determined in accordance with Section 2.3 and Section 2.4 of the NPI.

2.3.2 Project Intrusiveness Noise Level

The PINL ($LA_{eq(15min)}$) is the RBL + 5dB and seeks to limit the degree of change a new noise source introduces to an existing environment. Hence, when assessing intrusiveness, background noise levels need to be measured.

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

- the development must have been operating for a period in excess of 10 years in the assessment period/s being considered and is considered a normal part of the acoustic environment; and,

- the development must be operating in accordance with noise limits and requirements imposed in a consent or licence and/or be applying best practice.

Where a project intrusiveness noise level has been derived in this way, the derived level applies for a period of 10 years to avoid continuous incremental increases in intrusiveness noise levels. This approach is consistent with the purpose of the intrusiveness noise level to limit significant change in the acoustic environment. The purpose of the project amenity noise level is to moderate against background noise creep.

2.3.3 Project Amenity Noise Level

The PANL is relevant to a specific land use or locality. To limit continuing increases in intrusiveness levels, the ambient noise level within an area from all combined industrial sources should remain below the recommended amenity noise levels specified in Table 2.2 (of the NPI). The NPI defines two categories of amenity noise levels:

- **Amenity Noise Levels (ANL) –** are determined considering all current and future industrial noise within a receiver area; and
- **Project Amenity Noise Level (PANL) –** is the recommended level for a receiver area, specifically focusing the project being assessed.

Additionally, Section 2.4 of the NPI states: "*to ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise as follows*":

PANL for new industrial developments = recommended **ANL** minus 5dBA.

The following exceptions apply when deriving the PANL:

- areas with high traffic noise levels;
- proposed developments in major industrial clusters;
- existing industrial noise and cumulative industrial noise effects; and
- greenfield sites.

The NPI states with respect to high traffic noise areas:

The level of transport noise, road traffic noise in particular, may be high enough to make noise from an industrial source effectively inaudible, even though the LAeq noise level from that industrial noise source may exceed the project amenity noise level. In such cases the project amenity noise level may be derived from the LAeq, period(traffic) minus 15 dB(A).

Where relevant this assessment has considered influences of traffic with respect to amenity noise levels (ie areas where existing traffic noise levels are 10dB greater than the recommended amenity noise level).

The recommended amenity noise levels as per Table 2.2 of the NPI are reproduced in **Table 2.**

Table 2 Amenity Criteria

Receiver Type	Noise Amenity Area	Time of day	Recommended amenity noise level dB LAeq(period)
Residential	Rural	Day	50
		Evening	45
		Night	40
	Suburban	Day	55
		Evening	45
		Night	40
	Urban	Day	60
		Evening	50
		Night	45
Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks.	See column 4	See column 4	5dB above the recommended amenity noise level for a residence for the relevant noise amenity area and time of day
School Classroom	All	Noisiest 1-hour period when in use	35 (internal) 45 (external)
Hospital ward			
- internal	All	Noisiest 1-hour	35
- external	All	Noisiest 1-hour	50
Place of worship - internal	All	When in use	40
Passive Recreation	All	When in use	50
Active Recreation	All	When in use	55
Commercial premises	All	When in use	65
Industrial	All	When in use	70

Notes: The recommended amenity noise levels refer only to noise from industrial noise sources. However, they refer to noise from all such sources at the receiver location, and not only noise due to a specific project under consideration. The levels represent outdoor levels except where otherwise stated.

Types of receivers are defined as rural residential; suburban residential; urban residential; industrial interface; commercial; industrial – see Table 2.3 and Section 2.7 of the NPI.

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.

2.3.4 Maximum Noise Trigger Level Assessment

The potential for sleep disturbance from maximum noise level events from a project during the night-time period needs to be considered. The NPI considers sleep disturbance to be both awakenings and disturbance to sleep stages.

Where night-time noise levels from a development/premises at a residential location exceed the following criteria, a detailed maximum noise level event assessment should be undertaken:

- $L_{Aeq(15min)}$ 40dB or the prevailing RBL plus 5dBA, whichever is the greater, and/or
- L_{Amax} 52dB or the prevailing RBL plus 15dBA, whichever is the greater.

A detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the rating background noise level, and the number of times this happens during the night-time period.

Other factors that may be important in assessing the impacts on sleep disturbance include:

- how often the events would occur;
- the distribution of likely events across the night-time period and the existing ambient maximum events in the absence of the development;
- whether there are times of day when there is a clear change in the noise environment (such as during early morning shoulder periods); and
- current understanding of effects of maximum noise level events at night.

2.4 Interim Construction Noise Guideline

The assessment and management of noise from construction work is completed with reference to the Interim Construction Noise Guideline (ICNG). The ICNG is specifically aimed at managing noise from construction work regulated by the EPA and is used to assist in setting statutory conditions in licences or other regulatory instruments. The types of construction regulated by the EPA under the POEO Act (1997), include construction, maintenance and renewal activities carried out by a public authority, such as road upgrades as described in Schedule 1 of the POEO Act.

The ICNG sets out procedures to identify and address the impact of construction noise on residences and other sensitive land uses. This section provides a summary of noise objectives that are applicable to the assessment.

The ICNG provides two methodologies for the assessment of construction noise emissions:

- Quantitative, which is suited to major construction projects with typical durations of more than three weeks; and
- Qualitative, which is suited to short term infrastructure maintenance (for projects with a typical duration of less than three weeks).

The methodology for a quantitative assessment requires a more complex approach, involving noise emission predictions from construction activities to the nearest relevant receptors. The qualitative assessment methodology is a more simplified approach that relies more on noise management strategies. This study has adopted a quantitative assessment approach.

The quantitative approach includes identification of potentially affected receptors, description of activities involved in the project, derivation of the construction noise management levels, quantification of potential noise impact at receptors and, provides management and mitigation recommendations. **Table 3** summarises the ICNG recommended standard hours for construction.

Table 3 Recommended Standard Hours for Construction

Period	Preferred Construction Hours
Day (Standard construction hours)	Monday to Friday - 7am to 6pm Saturdays - 8am to 1pm Sundays or Public Holidays - No construction

The recommended hours do not apply in the event of direction from police, or other relevant authorities, for safety reasons or where required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm. Work conducted outside of standard hours are considered out of hours work (OOH). OOH periods are divided into two categories representing evening and night periods and cover the hours listed below:

OOH Period 1 (evening/low risk period): Monday to Friday – 6pm to 10pm, Saturdays – 1pm to 6pm, Sundays – 8am to 6pm.

OOH Period 2 (night/medium to high risk period): Monday to Friday – 10pm to 7am, Saturdays/Sundays – 6pm to 7am (8am on Sunday mornings).

2.4.1 Construction Noise Management Levels

Section 4 of the ICNG details the quantitative assessment method involving predicting noise levels and comparing them with the Noise Management Level (NML), and are important indicators of the potential level of construction noise impact. **Table 4** provides the ICNG recommended $L_{Aeq(15min)}$ NMLs and how they are to be applied.

Table 4 Noise Management Levels

Time of Day	Management Level $L_{Aeq(15min)}$[1]	How to Apply
Recommended standard hours: Monday to Friday 7am to 6pm Saturday 8am to 1pm No work on Sundays or public holidays.	Noise affected RBL + 10 dB.	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq(15min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of work to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dBA.	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account times identified by the community when they are less sensitive to noise (such as before and after school for work near schools, or mid-morning or mid-afternoon for work near residences; and if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours.	Noise affected RBL + 5 dB.	A strong justification would typically be required for work outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see section 7.2.2.

Note 1: The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the construction noise management levels for noise assessment purposes and is the median of the ABL's.

3 Noise Criteria

3.1 Background Noise Environment

3.1.1 Unattended Noise Monitoring

To quantify the existing background noise environment of the area, unattended noise monitoring was conducted at one location representative of the ambient environment surrounding the project. The selected monitoring location is shown in **Figure 1** and is considered representative of surrounding receivers as per Fact Sheet B1.1 of the NPI.

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 (L1) from Friday 27 March 2020 to Monday 6 April 2020. Observations on-site identified that the surrounding locality was typical of a suburban environment, with residential, traffic sources and distant urban hum audible. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA. All equipment carried appropriate and current NATA (or manufacturer) calibration certificates.

Data affected by adverse meteorological conditions have been excluded from the results in accordance with methodologies provided in Fact Sheet A4 of the NPI. The results of long-term unattended noise monitoring are provided in **Table 5** and plotted in graph format along with wind speed and rainfall for the monitoring period in **Appendix B.**

Table 5 Background Noise Monitoring Summary

Location	Measured background noise level, RBL, dBA			Measured dB L_{Aeq}		
	Day 7am to 6pm	Evening 6pm to 10pm	Night 10pm to 7am	Day 7am to 6pm	Evening 6pm to 10pm	Night 10pm to 7am
L1 (R1-R30)	39	37	32	53	52	47

Note: Excludes periods of wind or rain affected data. Meteorological data obtained from the Bureau of Meteorology weather station Scone Airport AWS 32.03°S 150.83°E 221m AMSL.

3.1.2 Attended Noise Monitoring

Attended noise measurements were completed at the existing animal care facility off Skellatar Stock Route on Friday 27 March 2020 to quantify the current noise levels of animal within the facility. The measurements were used to establish representative animal sound powers levels (see **Section 4.1**) which were adopted in the predictive noise modelling.

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3.2 Operational Noise Criteria

3.2.1 Project Intrusiveness Noise Levels

The Project Intrusiveness Noise Levels (PINLs) for the project are presented in **Table 6** and have been determined based on the RBL +5dBA.

Table 6 Intrusiveness Noise Levels

Receiver	Period[1]	Adopted RBL dB LA_{90}	PINL dB $LA_{eq(15min)}$
R1-R30	Day	39	44
	Evening	37	42
	Night	32	37

Note: As per Section 2.1 of the NPI, Intrusiveness Noise Levels only apply to residences.

Note 1: 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.

3.2.2 Project Amenity Noise Levels

Residential receivers situated in the surrounding area have been classified under the EPA's suburban amenity category. This criterion is used in conjunction with the intrusiveness criteria to determine the limiting criteria.

The Project Amenity Noise Levels (PANLs) for residential receivers and other receiver types (ie non-residential) potentially affected by the project are presented in **Table 7.**

Table 7 Amenity Noise Levels and Project Amenity Noise Levels

Receiver Type	Noise Amenity Area	Assessment Period[1]	Recommended ANL dB $LA_{eq(period)}$[2]	PANL dB $LA_{eq(period)}$[3]	PANL dB $LA_{eq(15min)}$[4]
R1-R30	Suburban	Day	55	50	53
		Evening	45	40	43
		Night	40	35	38
C1	Commercial	When in use	65	60	63
AR1	Active Recreational	When in use	55	50	53

Note 1: 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.

Note 2: Recommended amenity noise levels as per Table 2.2 of the NPI.

Note 3: Project Amenity Noise Level equals the amenity noise level – 5dB as there is other industry in the area.

Note 4: Includes a +3dB adjustment to the amenity period level to convert to a 15-minute assessment period as per Section 2.2 of the NPI.

3.2.3 Project Noise Trigger Levels

The Project Noise Trigger Levels (PNTLs) are the lower of either the PINL or the PANL. **Table 8** presents the derivation of the PNTLs in accordance with the methodologies outlined in the NPI.

Table 8 Project Noise Trigger Levels

Receiver	Period[1]	PINL dB $L_{Aeq(15min)}$	PANL dB $L_{Aeq(15min)}$	PNTL dB $L_{Aeq(15min)}$
R1-R30	Day	44	53	44
	Evening	42	43	42
	Night	37	38	37
C1	When in use	N/A	63	63
AR1	When in use	N/A	53	53

Note 1: 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.

3.3 Maximum Noise Trigger Level Criteria

The maximum noise trigger levels shown in **Table 9** is based on night time RBLs and trigger values as per Section 2.5 of the NPI.

Table 9 Maximum Noise Level Assessment Trigger Levels

Residential Receivers (R1-R30)			
$L_{Aeq(15min)}$		L_{Amax}	
40dB $L_{Aeq(15min)}$ or RBL + 5dB		52dB L_{Amax} or RBL + 15dB	
Trigger	40	Trigger	52
RBL 32+5dB	37	RBL 32+15dB	47
Highest	**40**	**Highest**	**52**

Note 1: As per Section 2.5 of the NPI, the highest of the two criteria are adopted as the screening criteria.

3.4 Construction Noise Management Levels

The Construction Noise Management Levels, established in accordance with the ICNG for the project are presented in **Table 10.**

Table 10 Construction Noise Management Levels

Receivers	Period[1]	Rating Background Level (RBL), dB L_{A90}	Noise Management Level dB $L_{Aeq(15min)}$ (RBL+10dB)
R1-R30	Day	39	49
AR1	Day	N/A	65
C1	Day	N/A	70

Note 1: See Table 3 of this report for Recommended Standard Hours for Construction.

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4 Noise Modelling Methodology

A computer model was developed to quantify project noise emissions to neighbouring receivers for typical construction activities and operations. DGMR (iNoise, Version 2020.0) noise modelling software was used to quantify noise emissions from typical construction activities and operations. iNoise is a new intuitive and quality assured software for industrial noise calculations in the environment. 3D noise modelling is considered industry best practice for assessing noise emissions from projects.

The model incorporated a three-dimensional digital terrain map giving all relevant topographic information used in the modelling process. Additionally, the model uses relevant noise source data, ground type, attenuation from barrier or buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers.

Plant and equipment were modelled at various locations and heights, representative of realistic operating conditions for assessed scenarios based on the proposed development plans (**Appendix C**).

The model calculation method used to predict noise levels was in accordance with ISO 9613-1 'Acoustics - Attenuation of sound during propagation outdoors. Part 1: Calculation of the absorption of sound by the atmosphere' and ISO 9613-2 'Acoustics - Attenuation of sound during propagation outdoors. Part 2: General method of calculation'. The ISO 9613 standard from 1996 is the most used noise prediction method worldwide. Many countries refer to ISO 9613 in their noise legislation. However, the ISO 9613 standard does not contain guidelines for quality assured software implementation, which leads to differences between applications in calculated results. In 2015 this changed with the release of ISO/TR 17534-3. This quality standard gives clear recommendations for interpreting the ISO 9613 method. iNoise fully supports these recommendations. The models and results for the 19 test cases are included in the software.

4.1 Sound Power Levels

An assessment of potential noise emissions associated with the project has been completed. The assessment has identified several noise sources that may contribute to potential acoustic impacts at surrounding residences and include dog and livestock noise, speech/conversation impacts from staff/patrons and vehicle movements. **Table 10** presents the sound power levels for each source assessed in this report.

Table 11 Acoustically Significant Sources – Sound Power Levels *(re 10-12 Watts)*			
Item and number modelled per 15 minutes	Individual Sound Power Level, dB $L_{Aeq(15min)}$	Total source Sound Power Level, dB $L_{Aeq(15min)}$	Source Height[1]
Operation			
Condenser plant (x3)	75	80	0.5m
Truck deliveries (x1)	92	92	1.5m
Patron car idle and start up (x5)	73	83	0.5m
Group of 4 patrons conversing (x5)	70	77	0.5m
Group of 7 dogs barking (x2)	100	103	0.5m
Livestock noise (x1)	98	98	1.0m
Sleep disturbance assessment (L_{Amax}), Night time periods (10pm to 7am)			
Truck delivery impact	102		1.0m
Maximum dog bark (Internal)	112		0.5m
Construction Fleet			
Combined Construction Fleet	108		1.5m

Note 1: Height above the relative ground or building below source.

Note 2: Source - MAC database.

Note 3: Total dBA is sound power level per item.

Table 12 provides a summary of project noise sources and the assessment period in which they propose to occur.

Table 12 Noise Generating Activities		
Activity/Source	Period	Operational
Exercise Yards	Day	✓
	Evening	✓
	Night	X
Livestock Pen	Day	✓
	Evening	✓
	Night	✓
Conversations in outdoor seating areas, BBQ area and community garden areas	Day	✓
	Evening	X
	Night	X
Patron Light Vehicles	Day	✓
	Evening	X
	Night	X
Mechanical Plant	Day	✓
	Evening	✓
	Night	✓
Staff/Delivery Vehicles	Day	✓
	Evening	✓
	Night	✓

Note 1: 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.

4.2 Noise Modelling Assumptions

The noise model incorporated the following assumptions:

- The eastern wall of the kennel buildings and exercise yards will be core filled block or strawbales (or equivalent lined) construction with metal cladding/sheeting and is to be built to a height of 1.8m above the relative yard level;
- Day periods - between the hours of 7am to 6pm, a total of up to 30 dogs are outside their kennel within the exercise yards. Up to 50% of dogs (ie 15 dogs) have been modelled barking continuously for 7.5 minutes in total out of 15 minutes;
- Evening and night periods - between the hours of 6pm to 7am, a total of up to 30 dogs are inside their kennels. Up to 50% of dogs (ie 15 dogs) have been modelled barking continuously for 7.5 minutes in total out of 15 minutes and the model has taken into account the level of noise attenuation provided by the kennels;
- The southern wall of the holding pens is constructed of lined metal sheeting, with limited louvres for ventilation;
- Mechanical plant is located on the western side of the buildings on ground level concrete slabs;
- The stock impound would contain small numbers of seized livestock animals such as sheep, goats, cattle or horses; and
- Public patrons can access the project site between the hours of 9:00am and 5:00pm.

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5 Results

5.1 Operational Noise Results

Noise predictions from all sources have been quantified surrounding residential receivers with results presented in **Table 13.**

The coincidence of all sources occurring onsite simultaneously for an entire 15-minute period is unlikely. However, it is probable that several sources may be audible simultaneously on occasion for a limited duration. To account for this, modelling has adopted the $LA_{eq(15min)}$ contribution of sources which were derived from in-field measurements of operation sources or activities. Noise levels from combined activities are predicted to satisfy the relevant NPI criteria at all nearest receivers.

Table 13 Combined Noise Predictions – All Receivers

Residential Receivers

Receiver	Predicted Noise Level dB $L_{Aeq(15min)}$			PNTL dB $L_{Aeq(15min)}$			Compliant
	Day	Evening	Night	Day	Evening	Night	
R1	40	<35	<35	44	42	37	✓
R2	39	<35	<35	44	42	37	✓
R3	38	<35	<35	44	42	37	✓
R4	<35	<35	<35	44	42	37	✓
R5	<35	<35	<35	44	42	37	✓
R6	35	<35	<35	44	42	37	✓
R7	<35	<35	<35	44	42	37	✓
R8	40	<35	<35	44	42	37	✓
R9	39	<35	<35	44	42	37	✓
R10	<35	<35	<35	44	42	37	✓
R11	<35	<35	<35	44	42	37	✓
R12	<35	<35	<35	44	42	37	✓
R13	<35	<35	<35	44	42	37	✓
R14	<35	<35	<35	44	42	37	✓
R15	<35	<35	<35	44	42	37	✓
R16	<35	<35	<35	44	42	37	✓
R17	<35	<35	<35	44	42	37	✓
R18	<35	<35	<35	44	42	37	✓
R19	<35	<35	<35	44	42	37	✓
R20	<35	<35	<35	44	42	37	✓
R21	<35	<35	<35	44	42	37	✓
R22	<35	<35	<35	44	42	37	✓
R23	<35	<35	<35	44	42	37	✓
R24	<35	<35	<35	44	42	37	✓
R25	<35	<35	<35	44	42	37	✓
R26	<35	<35	<35	44	42	37	✓
R27	<35	<35	<35	44	42	37	✓
R28	<35	<35	<35	44	42	37	✓
R29	<35	<35	<35	44	42	37	✓
R30	<35	<35	<35	44	42	37	✓

Other Receivers

Receiver	Period	Predicted Noise Level dB $L_{Aeq(15min)}$	PNTL dB $L_{Aeq(15min)}$	Compliant
AR1	When in use	<35	53	✓
C1	When in use	40	63	✓

Note 1: 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.

5.2 Maximum Noise Levels Assessment Results

In assessing transient noise events, typical LA_{max} noise levels were assessed to the nearest residential receivers. For the maximum noise assessment, a sound power level of 112dBA for a maximum dog bark inside the holding pens and a sound power of 102dBA for delivery impacts are adopted for this assessment. The night-time operational scenario is adopted for the $LA_{eq(15min)}$ assessment. Predicted noise levels from $LA_{eq(15min)}$ and LA_{max} events for assessed receivers are presented in **Table 14.** Results identify that the maximum noise events trigger values will be satisfied for all assessed receivers.

Table 14 Maximum Noise Levels Assessment (Night)[1]						
Receiver	Predicted Noise Level			Trigger Values		Compliant
	dB $L_{Aeq(15min)}$	dB L_{Amax}		dB $L_{Aeq(15min)}$	dB L_{Amax}	
		Dog Bark	Delivery Impact			
R1	<35	41	42	40	52	✓
R2	<35	45	41	40	52	✓
R3	<35	46	35	40	52	✓
R4	<35	43	<35	40	52	✓
R5	<35	42	<35	40	52	✓
R6	<35	45	<35	40	52	✓
R7	<35	45	<35	40	52	✓
R8	<35	50	36	40	52	✓
R9	<35	50	39	40	52	✓
R10	<35	40	<35	40	52	✓
R11	<35	40	<35	40	52	✓
R12	<35	39	<35	40	52	✓
R13	<35	41	<35	40	52	✓
R14	<35	40	<35	40	52	✓
R15	<35	39	<35	40	52	✓
R16	<35	38	44	40	52	✓
R17	<35	38	45	40	52	✓
R18	<35	37	43	40	52	✓
R19	<35	37	42	40	52	✓
R20	<35	36	42	40	52	✓
R21	<35	36	41	40	52	✓
R22	<35	36	41	40	52	✓
R23	<35	35	36	40	52	✓
R24	<35	35	35	40	52	✓
R25	<35	<35	<35	40	52	✓
R26	<35	<35	<35	40	52	✓
R27	<35	<35	<35	40	52	✓
R28	<35	<35	<35	40	52	✓
R29	<35	<35	<35	40	52	✓
R30	<35	<35	<35	40	52	✓

Note 1: 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.

5.3 Construction Noise Results

Table 15 presents the results of modelled construction noise emissions. Predictions identify that levels from construction have the potential to be above the noise management levels for several assessed receivers. Accordingly, recommendations to reduce the impact of construction noise emissions on surrounding receivers, are provided in **Section 6.**

Table 15 Construction Noise Levels – All Receivers				
Receiver	Period[1]	Predicted Noise Level dB $LA_{eq(15min)}$	Management Level dB $LA_{eq(15min)}$	Compliant
Residential Receivers				
R1	Day	51	49	X
R2	Day	49	49	✓
R3	Day	49	49	✓
R4	Day	44	49	✓
R5	Day	39	49	✓
R6	Day	49	49	✓
R7	Day	45	49	✓
R8	Day	57	49	X
R9	Day	52	49	X
R10	Day	36	49	✓
R11	Day	37	49	✓
R12	Day	55	49	X
R13	Day	55	49	X
R14	Day	55	49	X
R15	Day	52	49	X
R16	Day	50	49	X
R17	Day	49	49	✓
R18	Day	49	49	✓
R19	Day	48	49	✓
R20	Day	48	49	✓
R21	Day	47	49	✓
R22	Day	46	49	✓
R23	Day	45	49	✓
R24	Day	<35	49	✓
R25	Day	<35	49	✓
R26	Day	<35	49	✓
R27	Day	<35	49	✓
R28	Day	<35	49	✓
R29	Day	37	49	✓
R30	Day	51	49	X
Other Receivers				
AR1	Day	42	65	✓
C1	Day	59	70	✓

Note 1: See Table 3 of this report for Recommended Standard Hours for Construction.

6 Construction Recommendations

The results of the noise assessment demonstrate that levels during standard construction hours have the potential to be above the ICNG noise management levels at the nearest receivers to the project. Accordingly, it is recommended that noise management and mitigation measures be adopted during noise intensive construction activities to limit impacts on surrounding receivers.

Recommendations for consideration during construction activities for this project may include:

- implement boundary fences/retaining walls as early as possible to maximise their attenuation benefits to surrounding receivers;
- toolbox and induction of personnel prior to shift to discuss noise control measures that may be implemented to reduce noise emissions to the community;
- where possible use mobile screens or construction hording to act as barriers between construction works and receivers;
- all plant should be shut down when not in use. Plant to be parked/started at farthest point from relevant assessment locations;
- operating plant in a conservative manner (no over-revving);
- selection of the quietest suitable machinery available for each activity;
- avoidance of noisy plant/machinery working simultaneously where practicable;
- minimisation of metallic impact noise;
- all plant are to utilise a broadband reverse alarm in lieu of the traditional hi frequency type reverse alarm; and
- undertake letter box drops to notify receivers of potential works.

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7 Conclusion and Recommendations

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Pitt&Sherry Operations Pty Ltd (P&S) on behalf of Muswellbrook Shire Council to prepare a Noise Impact Assessment (NIA) to quantify potential noise emissions associated with the proposed Muswellbrook Animal Boarding Establishment (the 'project') to be located at 127-129 Sydney Street, Muswellbrook, NSW.

The assessment quantified noise levels from animal noise, patron noise, vehicle movements and mechanical plant.

The results of the assessment demonstrate that taking into account noise modelling assumptions in **Section 4.2** noise levels comply with relevant NPI and maximum noise trigger values for the operation of the establishment.

Modelled noise emissions from project construction activities identify that predicted noise emissions levels are anticipated to be above the applicable construction management levels. Accordingly, noise management measures are provided in this report to reduce potential impacts on surrounding receivers.

Based the Noise Impact Assessment results, assumption listed in **Section 4.2** and recommendations provided in **Section 6** of this report, there are no noise related issues which would prevent Council approving the project.

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Appendix A – Glossary of Terms

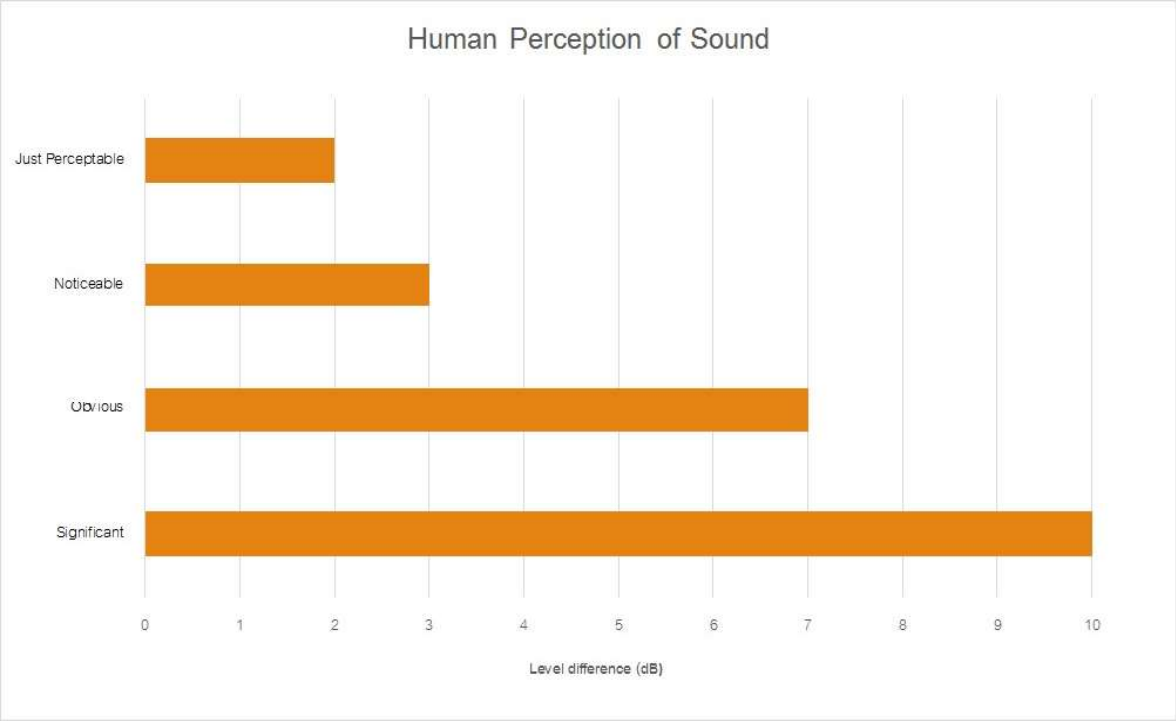
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
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 LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many 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 noise.
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. In some cases the overall change in noise level is described in dB rather than dBA, or dBZ which relates to the weighted scale.
dB(Z)	Linear Z-weighted decibels.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

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 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



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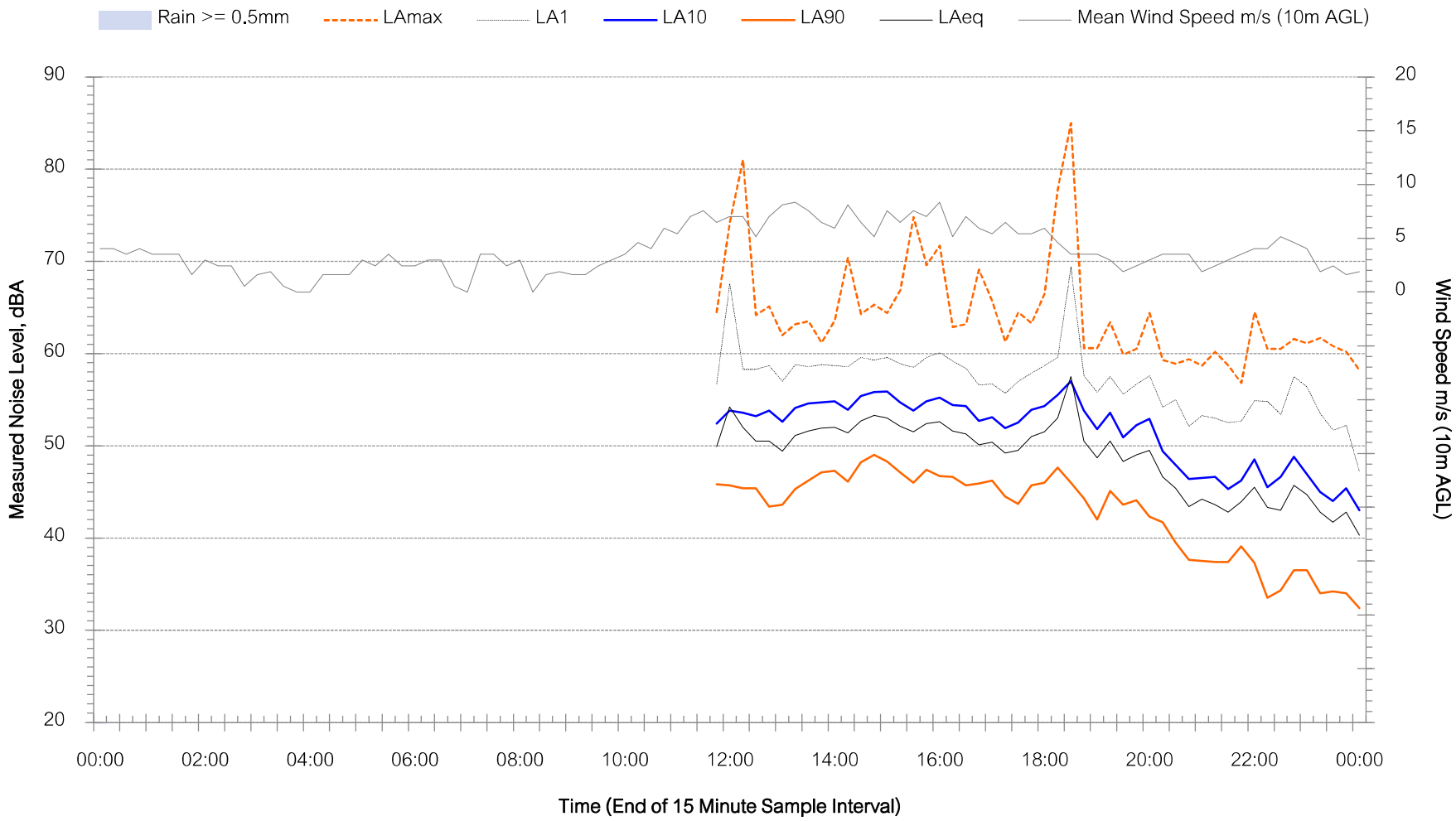
Appendix B – Noise Monitoring Charts

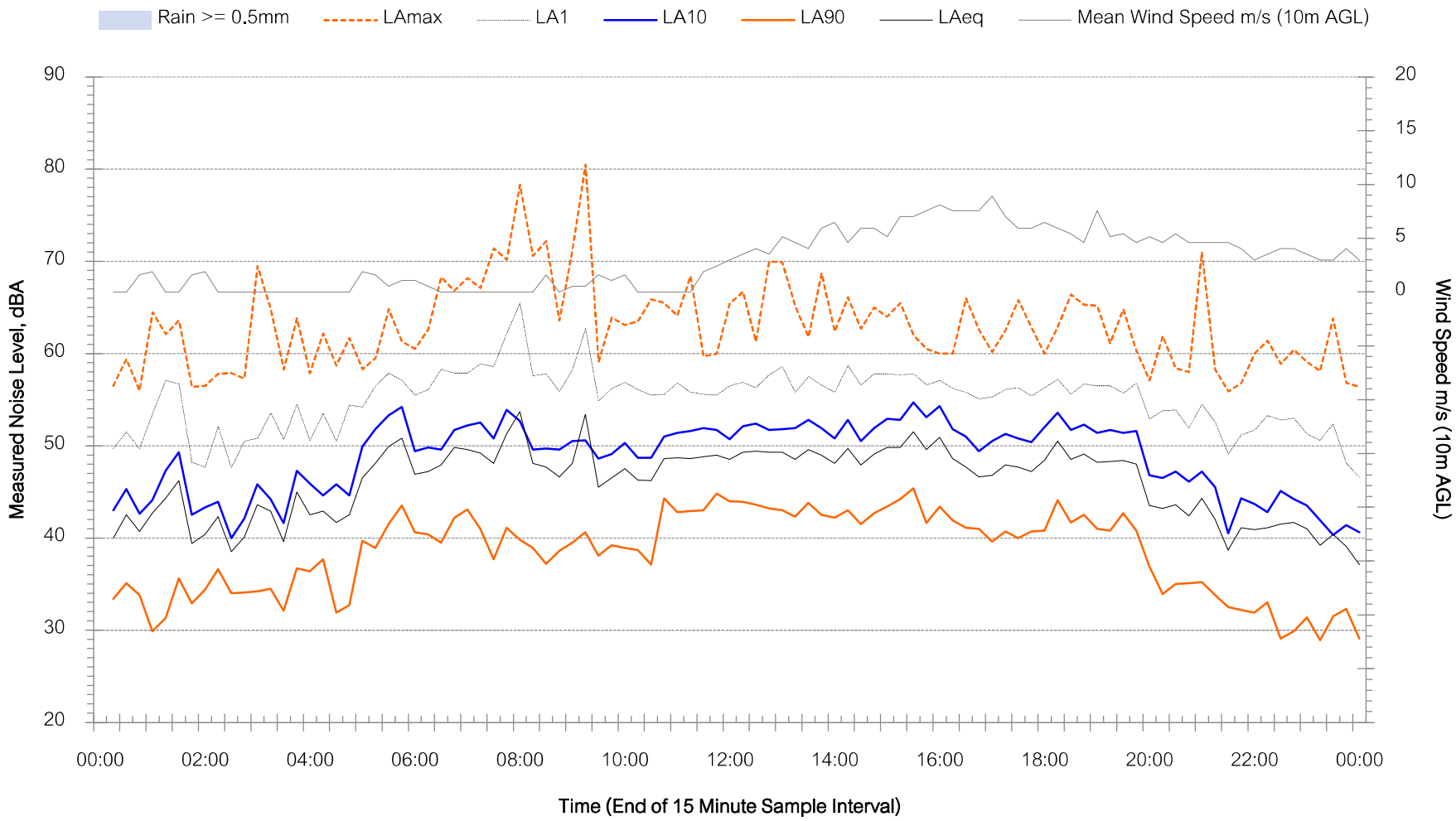
Background Noise Levels

127 Sydney Street, Muswellbrook - Friday 27 March 2020



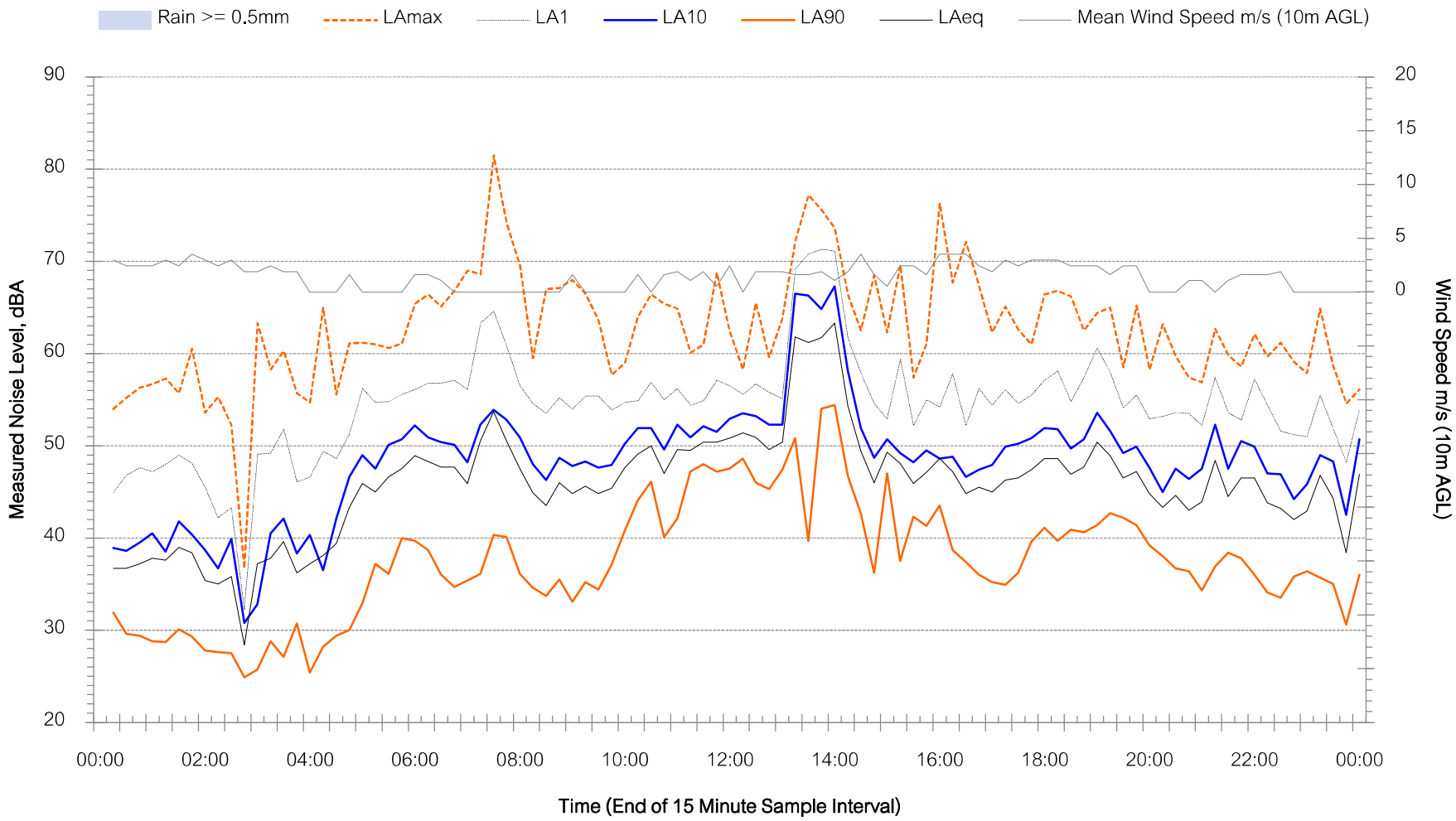
Background Noise Levels

127 Sydney Street, Muswellbrook - Saturday 28 March 2020



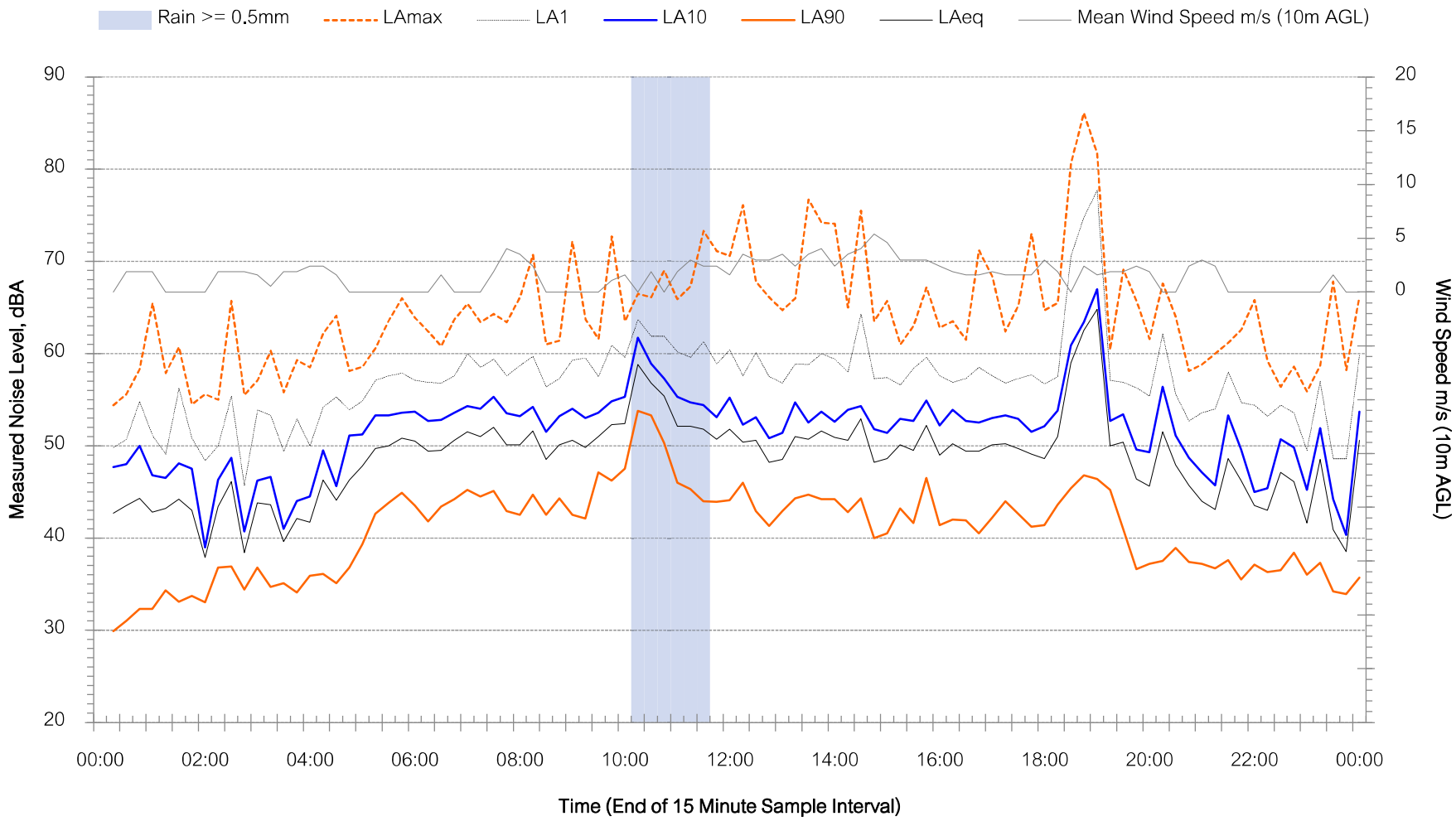
Background Noise Levels

127 Sydney Street, Muswellbrook - Sunday 29 March 2020



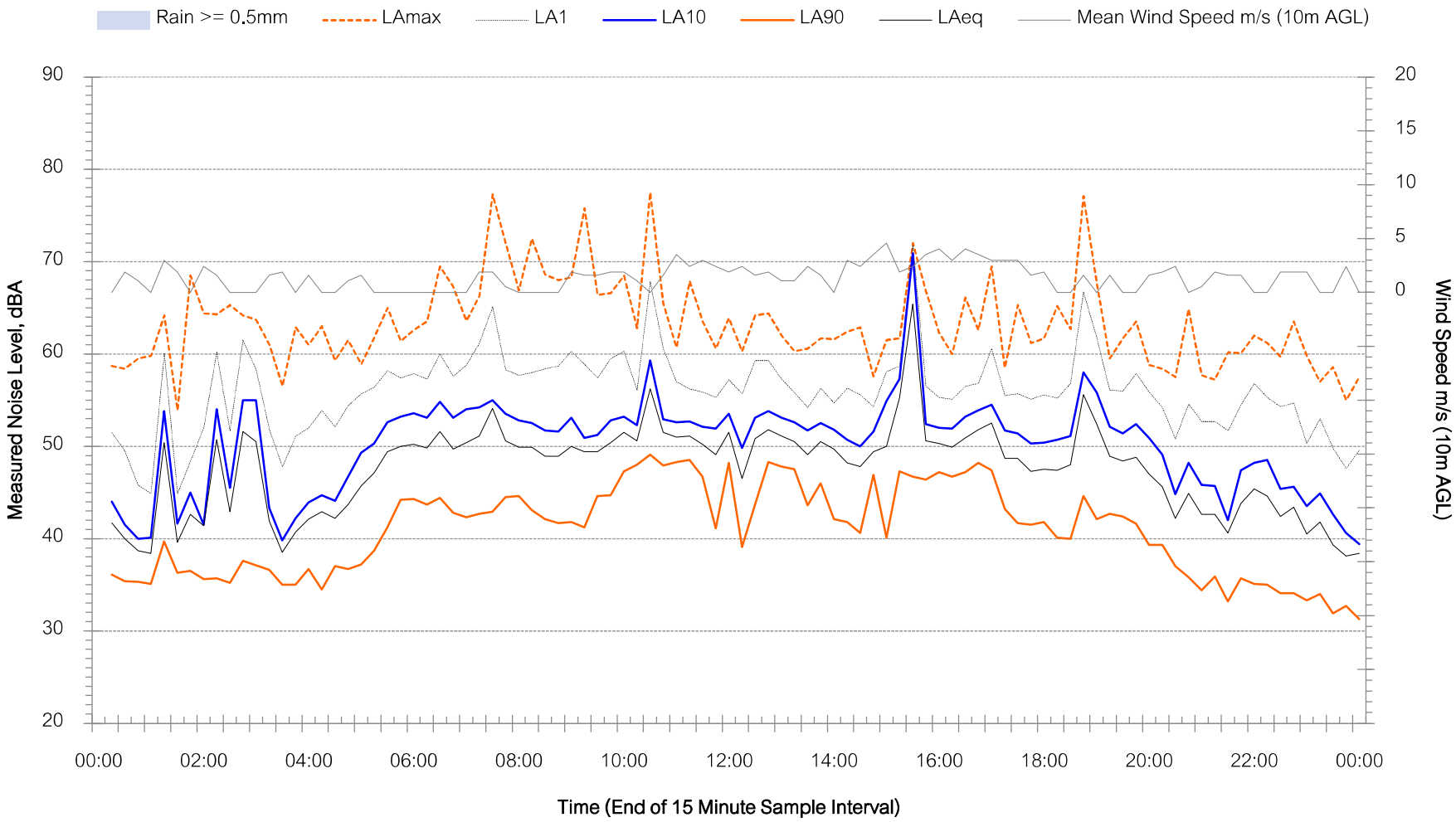
Background Noise Levels

127 Sydney Street, Muswellbrook - Monday 30 March 2020



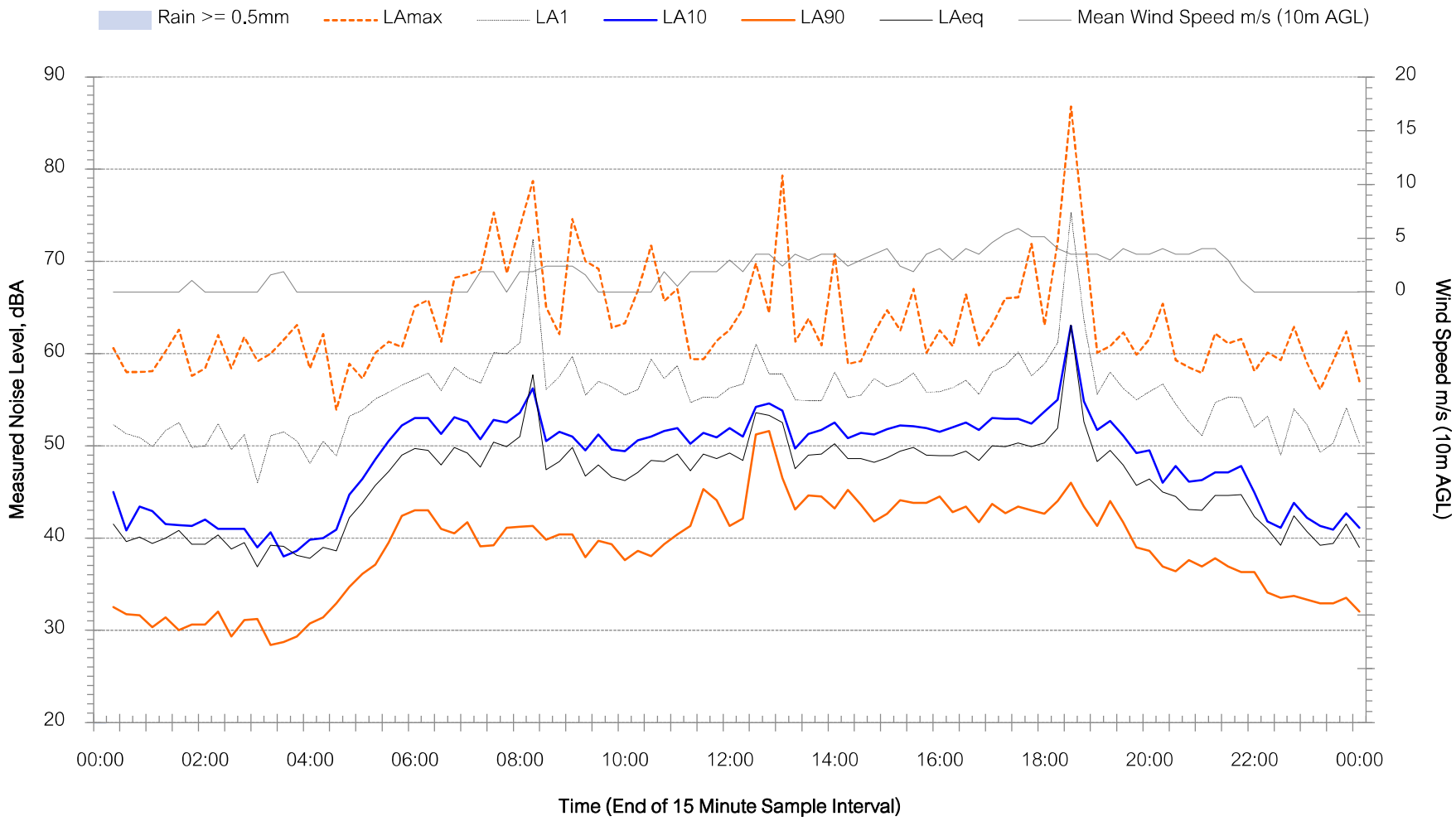
Background Noise Levels

127 Sydney Street, Muswellbrook - Tuesday 31 March 2020



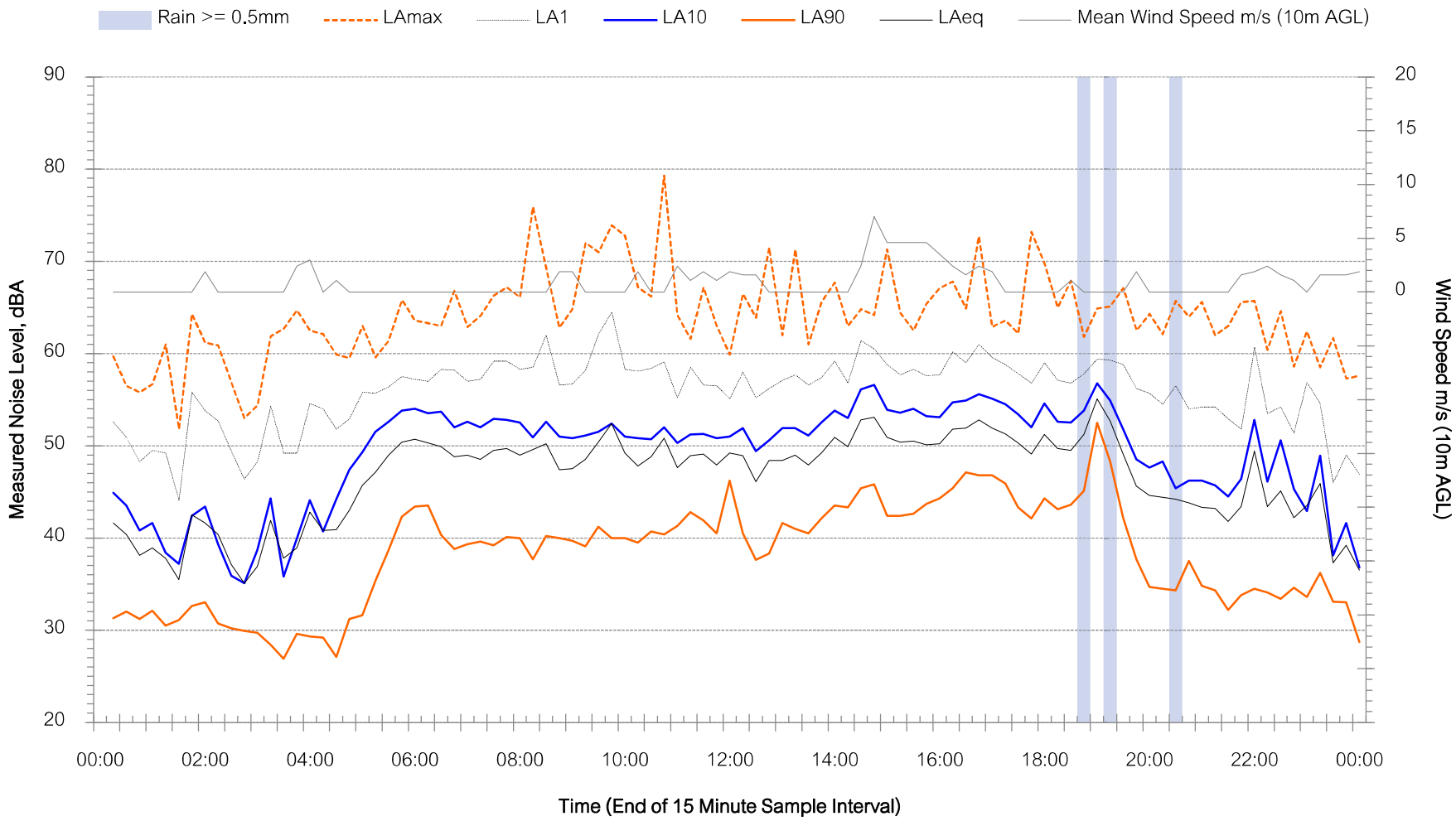
Background Noise Levels

127 Sydney Street, Muswellbrook - Wednesday 1 April 2020



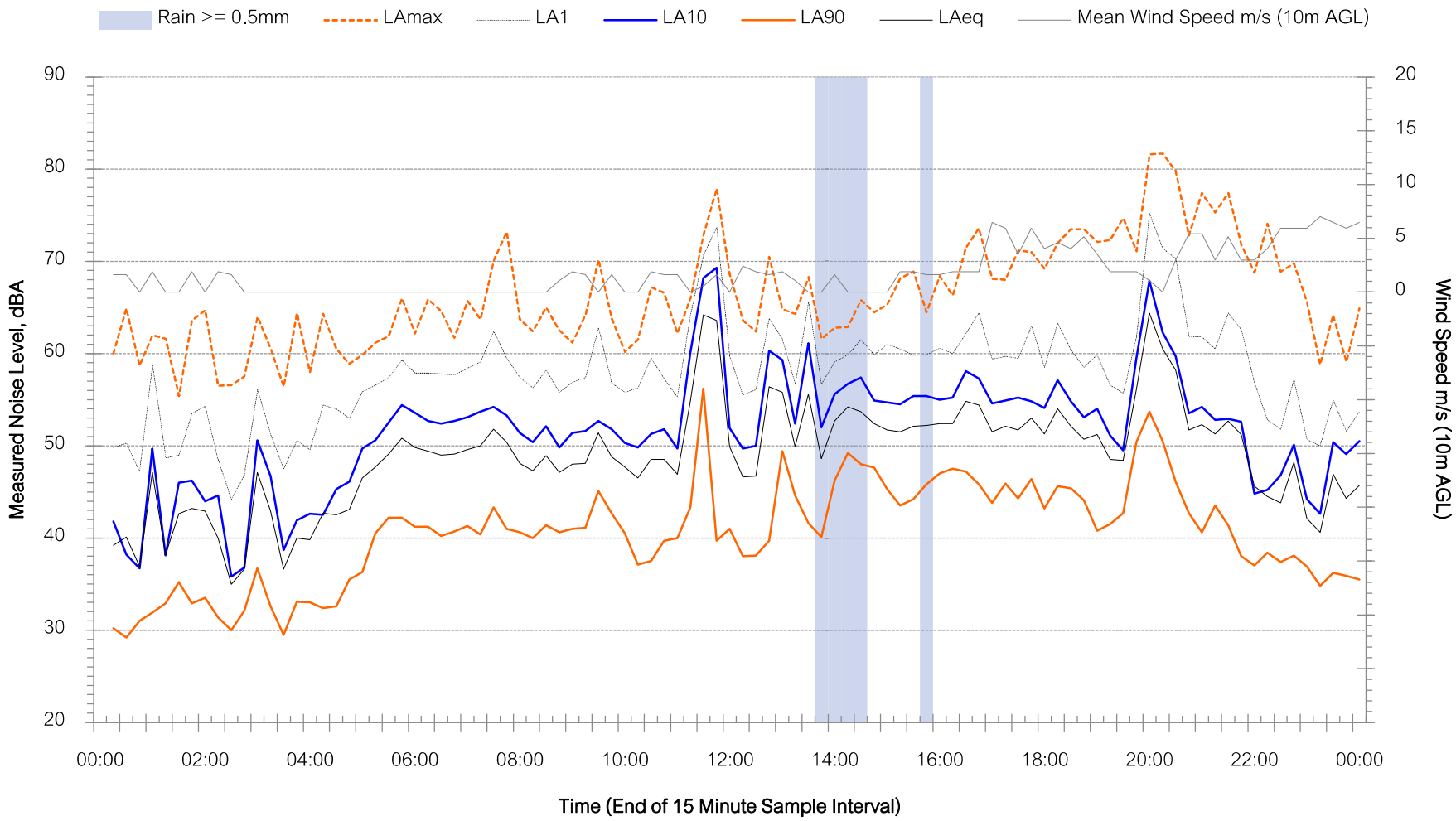
Background Noise Levels

127 Sydney Street, Muswellbrook - Thursday 2 April 2020



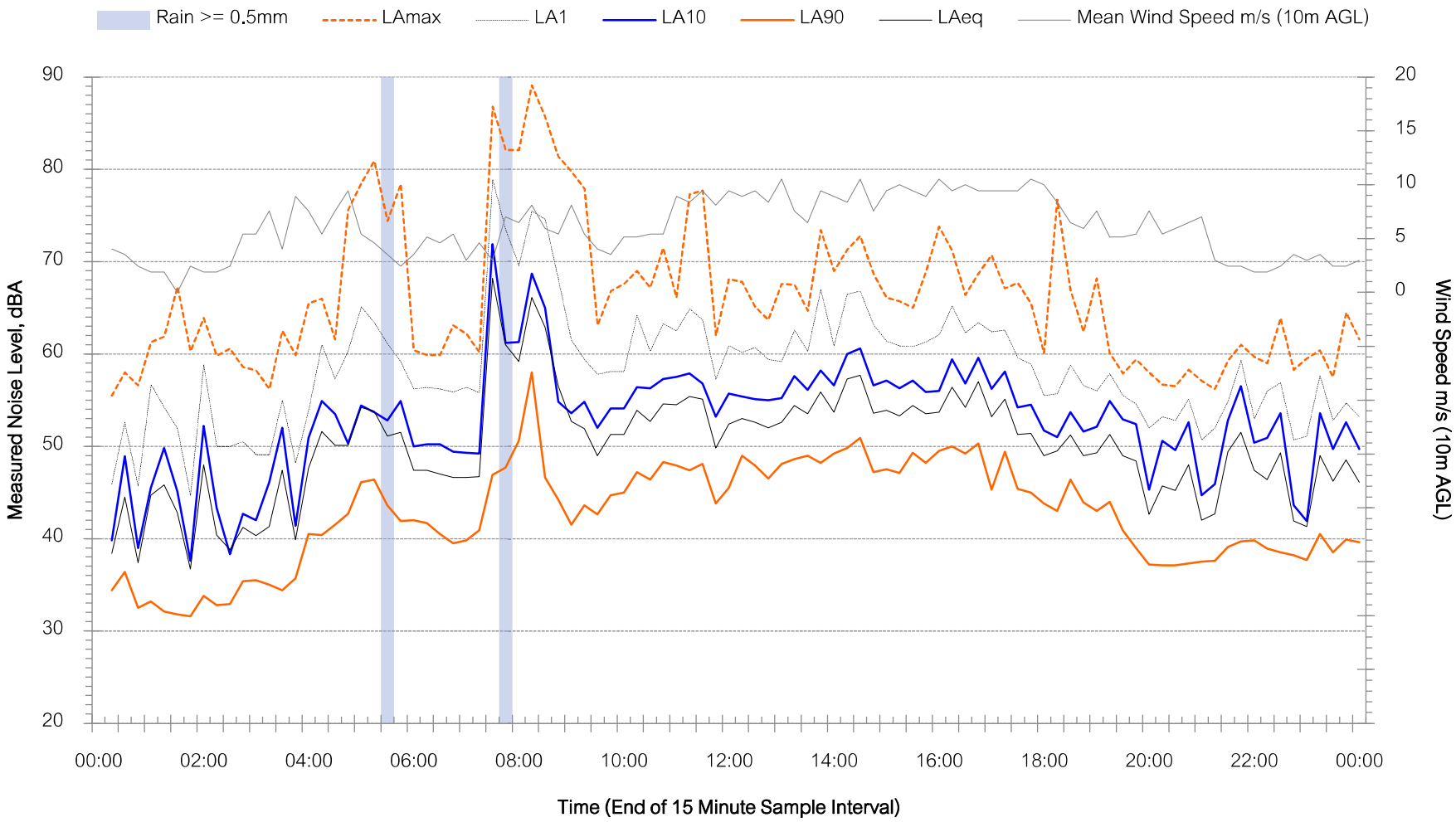
Background Noise Levels

127 Sydney Street, Muswellbrook - Friday 3 April 2020



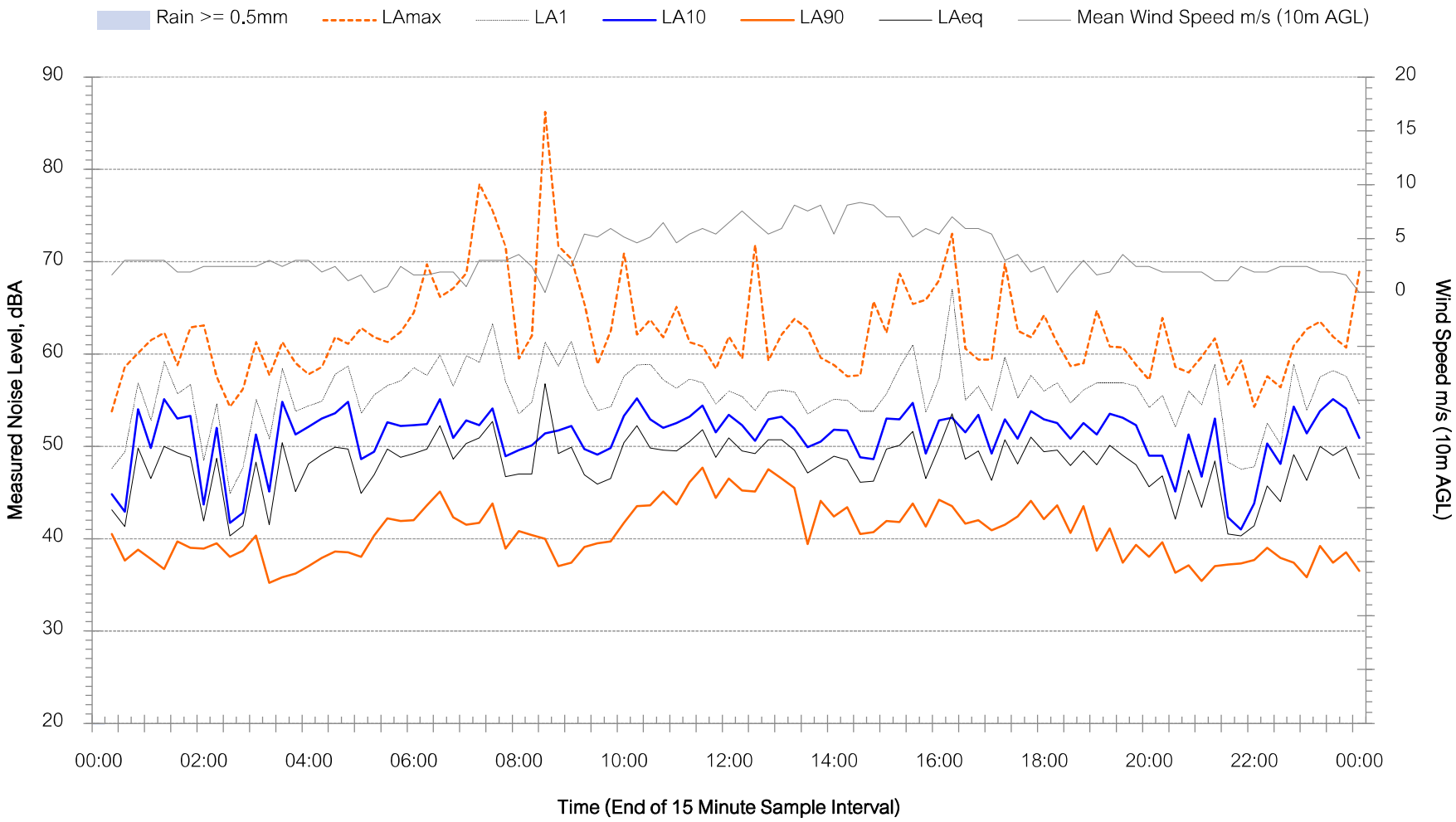
Background Noise Levels

127 Sydney Street, Muswellbrook - Saturday 4 April 2020



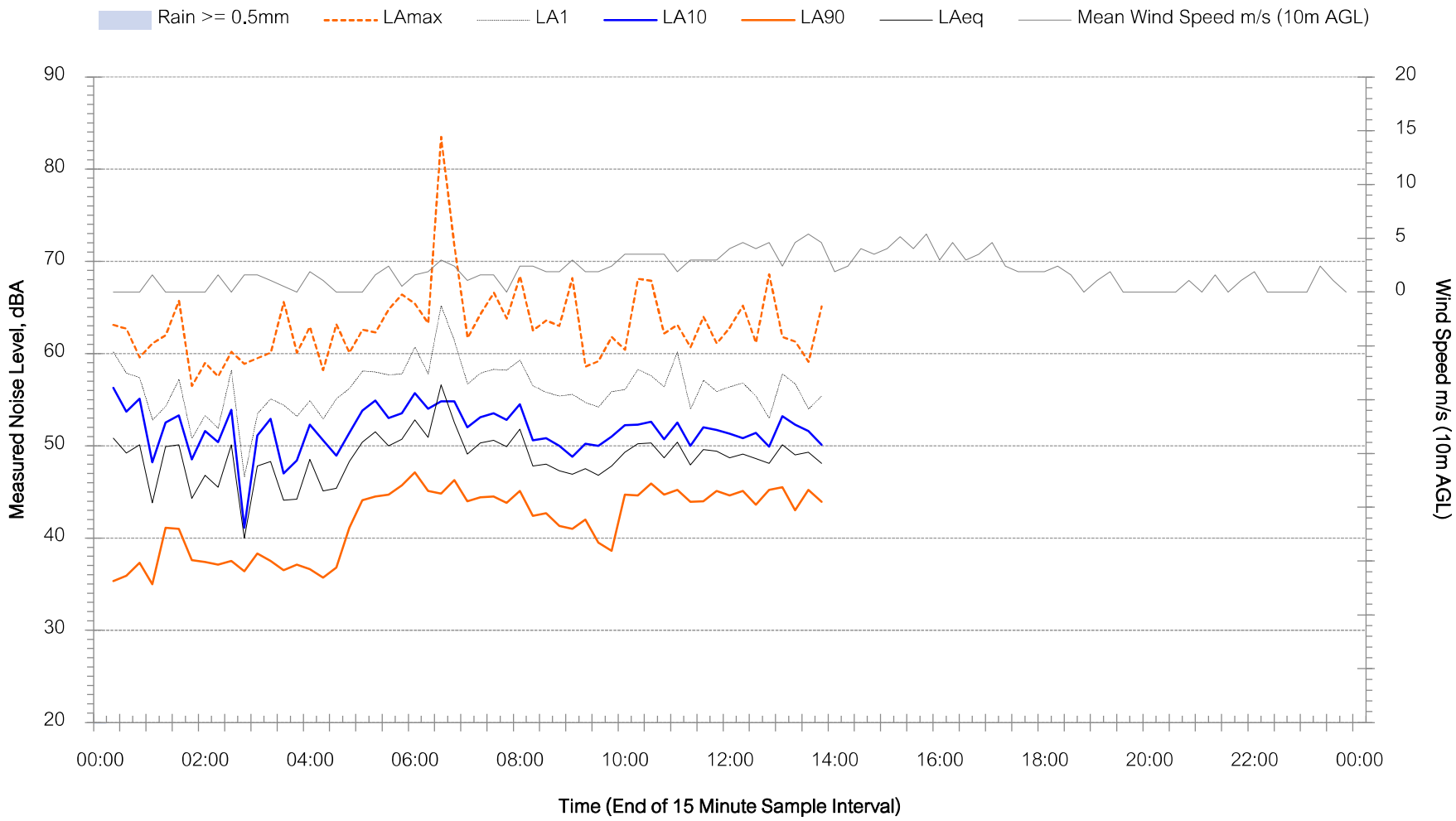
Background Noise Levels

127 Sydney Street, Muswellbrook - Sunday 5 April 2020

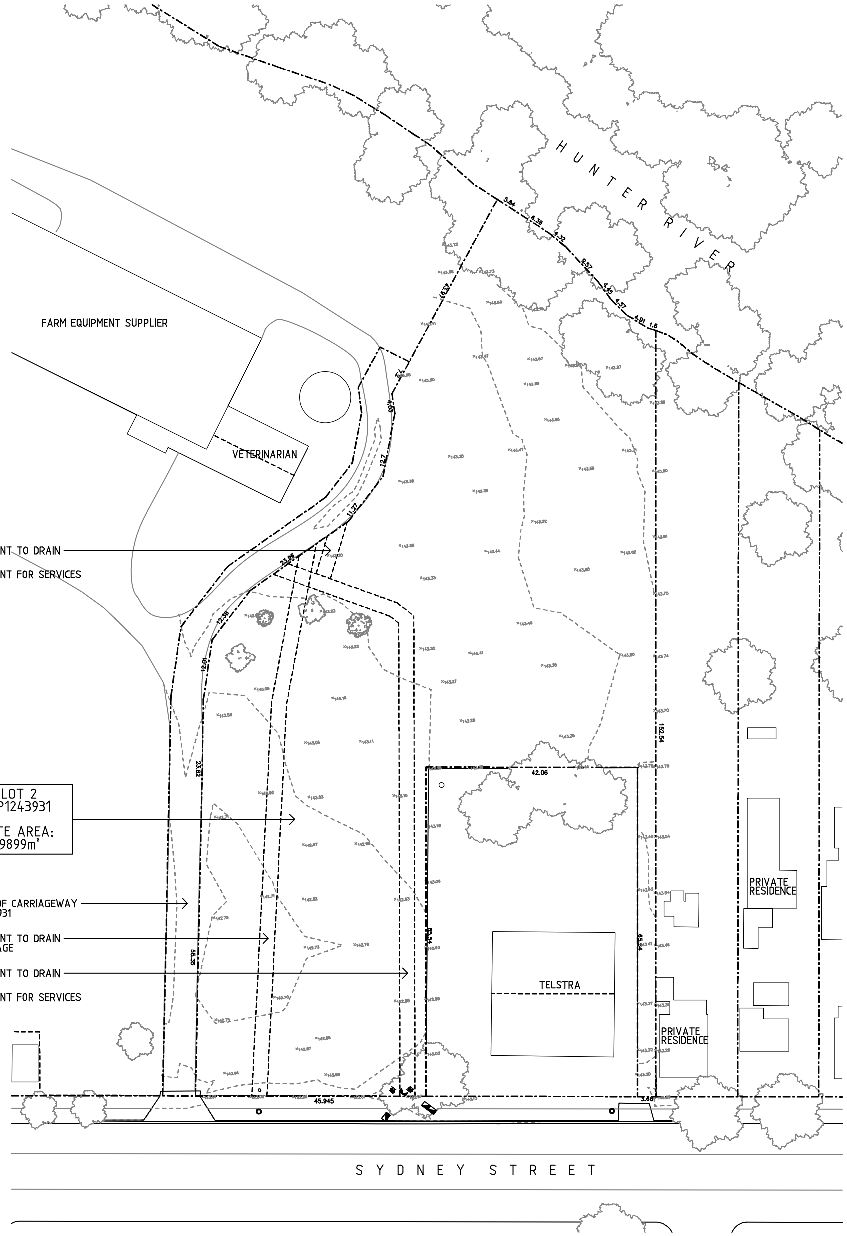


Background Noise Levels

127 Sydney Street, Muswellbrook - Monday 6 April 2020



Appendix C – Site Plans



01 **Site Plan - Existing**
1:500 @ A1

Conrad Gargett
Vokes and Peters

NOT FOR CONSTRUCTION

ALL SITE PLAN LAYOUTS, CONTOURS AND LEVEL INFORMATION IS ACCESSED FROM FYFE PTY LTD PLAN REFERENCE 90002-64-1-1 AND AERIAL PHOTOGRAPHY. ACTUAL DIMENSIONS AND LAYOUTS MAY VARY SLIGHTLY FROM THOSE INDICATED.

THESE DESIGN DRAWINGS HAVE BEEN PREPARED FOR DEVELOPMENT APPROVAL ONLY AND WILL NEED TO BE SUPPLEMENTED WITH FURTHER DETAILED DESIGN AND SPECIALIST CONSULTANT REVIEW INCLUDING TRAFFIC, CIVIL, STRUCTURAL, ACOUSTIC AND SERVICES ENGINEERING, TOGETHER WITH BUSHFIRE AND FLOOD PLANNING, BUILDING CERTIFICATION AND ENERGY EFFICIENCY.

ALL LEVELS ARE INDICATIVE ONLY AND REQUIRE COORDINATION WITH FLOOD CONSULTANTS PLANNING REPORT PRIOR TO BEING FINALISED.

Revision

Client
MUSWELLBROOK SHIRE COUNCIL

Project
MUSWELLBROOK ACF

Drawing
Site Plan - Existing

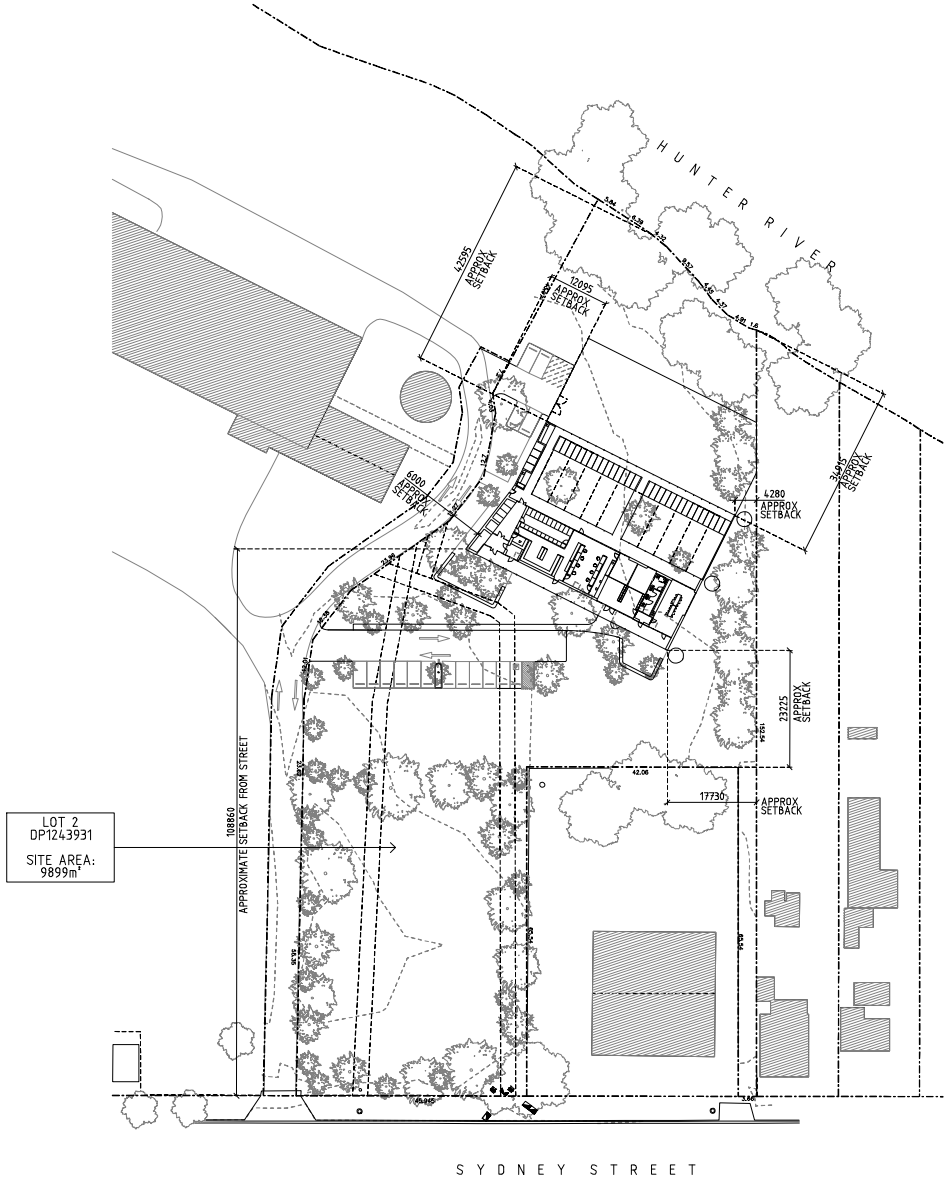
PROJECT NO: 18666
DATE ISSUED: 3-Apr-20
DRAWING NO: DA00

DEVLOPMENT DATA

RPD:	LOT 2 ON DP1243931
SITE AREA:	9,899m^2.
PROPOSED GFA:	382m^2 APPROX.
FLOOR SPACE RATIO:	4% APPROX.
CAR PARKING PROPOSED:	16
BUILDING HEIGHT	6m

Details

Do not scale this drawing and verify all dimensions and levels on site.
Nominated Architect : Lawrence Toaldo NSW Reg. 10255.



Conrad Gargett

Vokes and Peters

NOT FOR CONSTRUCTION

ALL SITE PLAN LAYOUTS, CONTOURS AND LEVEL INFORMATION IS ACCESSED FROM TYPE PTY LTD PLAN REFERENCE 18002-4A-11 AND AERIAL PHOTOGRAPHY. ACTUAL DIMENSIONS AND LAYOUTS MAY VARY SLIGHTLY FROM THOSE INDICATED.

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Revision

Client

MUSWELLBROOK SHIRE COUNCIL

Project

MUSWELLBROOK ACF

Drawing

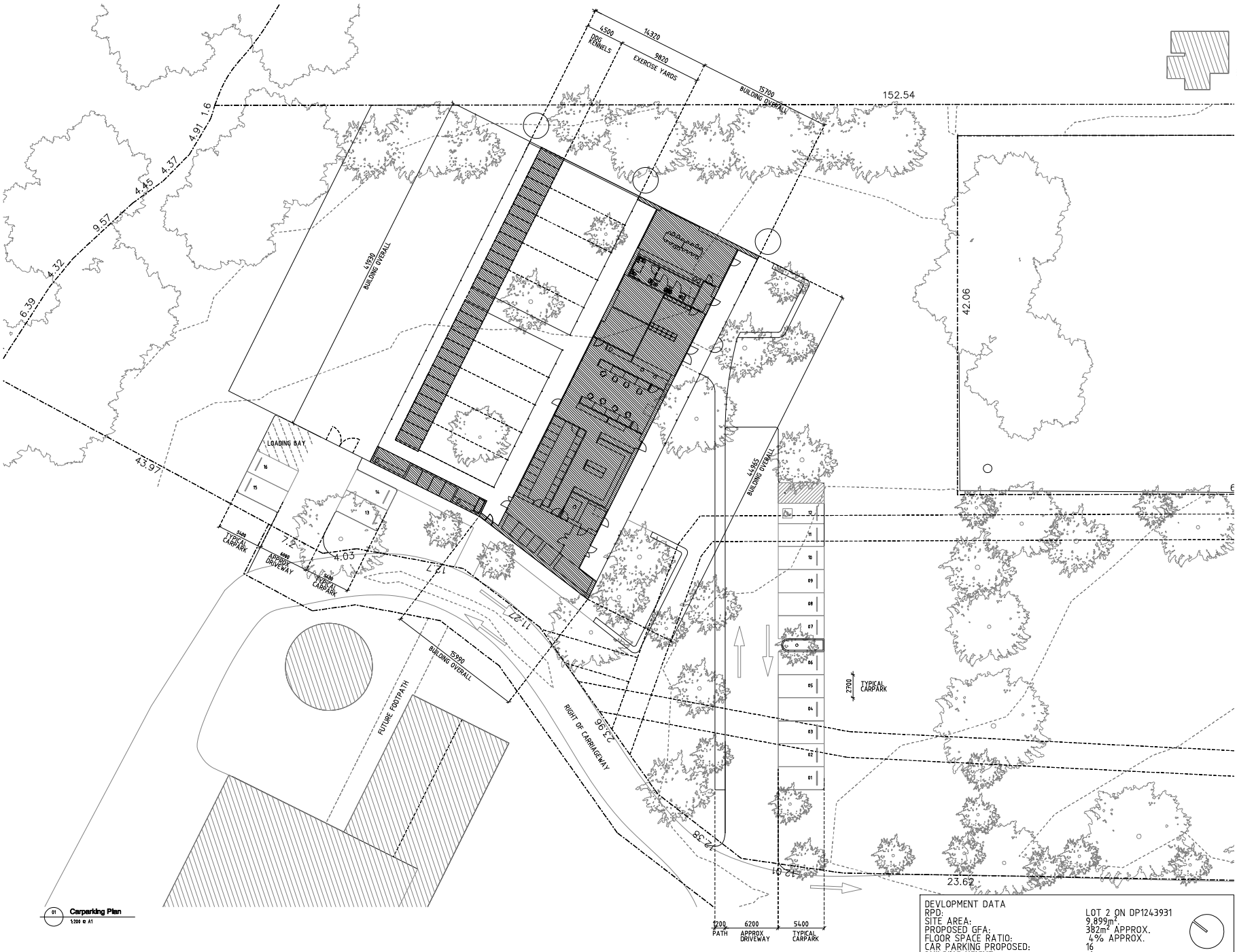
Site Plan

PROJECT NO: 18666
DATE ISSUED: 3-Apr-20
DRAWING NO: DA01

01 **Site Plan**
1:500 @ A1

DEVLOPMENT DATA	
RPD:	LOT 2 ON DP1243931
SITE AREA:	9,899m².
PROPOSED GFA:	382m² APPROX.
FLOOR SPACE RATIO:	4% APPROX.
CAR PARKING PROPOSED:	16
BUILDING HEIGHT	6m

Details



01 Carparking Plan
1:200 @ A1

DEVLOPMENT DATA	
RPD:	LOT 2 ON DP1243931
SITE AREA:	9,899m².
PROPOSED GFA:	382m² APPROX.
FLOOR SPACE RATIO:	4% APPROX.
CAR PARKING PROPOSED:	16
BUILDING HEIGHT	6m

Conrad Gargett

Vokes and Peters

NOT FOR CONSTRUCTION

ALL SITE PLAN LAYOUTS, CONTOURS AND LEVEL INFORMATION IS ACCESSED FROM TYPE PTY LTD PLAN REFERENCE 18002-4A-1-1 AND AERIAL PHOTOGRAPHY. ACTUAL DIMENSIONS AND LAYOUTS MAY VARY SLIGHTLY FROM THOSE INDICATED.

THESE DESIGN DRAWINGS HAVE BEEN PREPARED FOR DEVELOPMENT APPROVAL ONLY AND ARE NOSO TO BE SUPPLEMENTED WITH FURTHER DETAILED DESIGN AND SPECIFICATIONS BY CONSULTANT ARCHITECTURAL, CIVIL, STRUCTURAL, MECHANICAL, HYDRAULIC, ELECTRICAL, TOGETHER WITH BUILDING CODE PLANNING, BUILDING CERTIFICATION AND ENERGY EFFICIENCY.

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Revision

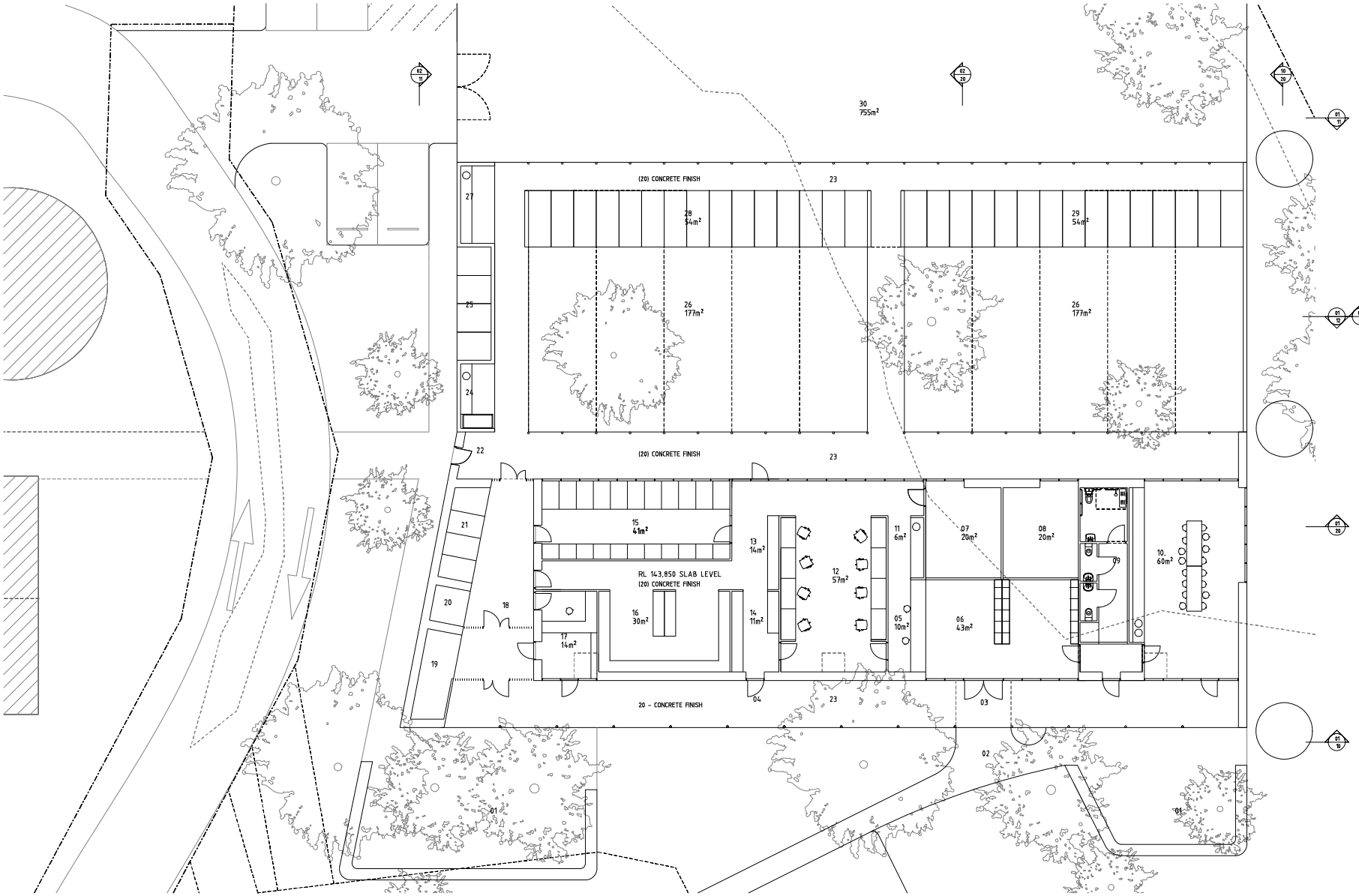
Client
MUSWELLBROOK SHIRE COUNCIL

Project
MUSWELLBROOK ACF

Drawing
Carparking Plan

PROJECT NO: 18666
DATE ISSUED: 3-Apr-20
DRAWING NO: DA02

Details



Conrad Gargett

Vokes and Peters

NOT FOR CONSTRUCTION

ALL SITE PLAN LAYOUTS, CONTOURS AND LEVEL INFORMATION IS ACCESSED FROM TYPE PTY LTD PLAN REFERENCE 18002-4A-1-1 AND AERIAL PHOTOGRAPHY. ACTUAL DIMENSIONS AND LAYOUTS MAY VARY SLIGHTLY FROM THOSE INDICATED.

THESE DESIGN DRAWINGS HAVE BEEN PREPARED FOR DEVELOPMENT APPROVAL ONLY AND WILL NEED TO BE SUPPLEMENTED WITH FURTHER DETAILED DESIGN AND SPECIFICATIONS BY CONSULTANT ENGINEERS (MECHANICAL, CIVIL, STRUCTURAL, HYDRAULIC, ELECTRICAL) AND PLANNING, TOGETHER WITH BUILDING AND FLOOD PLANNING, BUILDING CERTIFICATION AND ENERGY EFFICIENCY.

ALL LEVELS ARE INDICATIVE ONLY AND REQUIRE CORROBORATION WITH FLOOD CONSULTANTS PLANNING REPORT PRIOR TO BEING FINALISED.

Revision

Client

MUSWELLBROOK SHIRE COUNCIL

Project

MUSWELLBROOK ACF

Drawing

Floor Plan

PROJECT NO: 18666
DATE ISSUED: 3-Apr-20
DRAWING NO: DA03

01 Floor Plan
1:100 @ A1

LEGEND

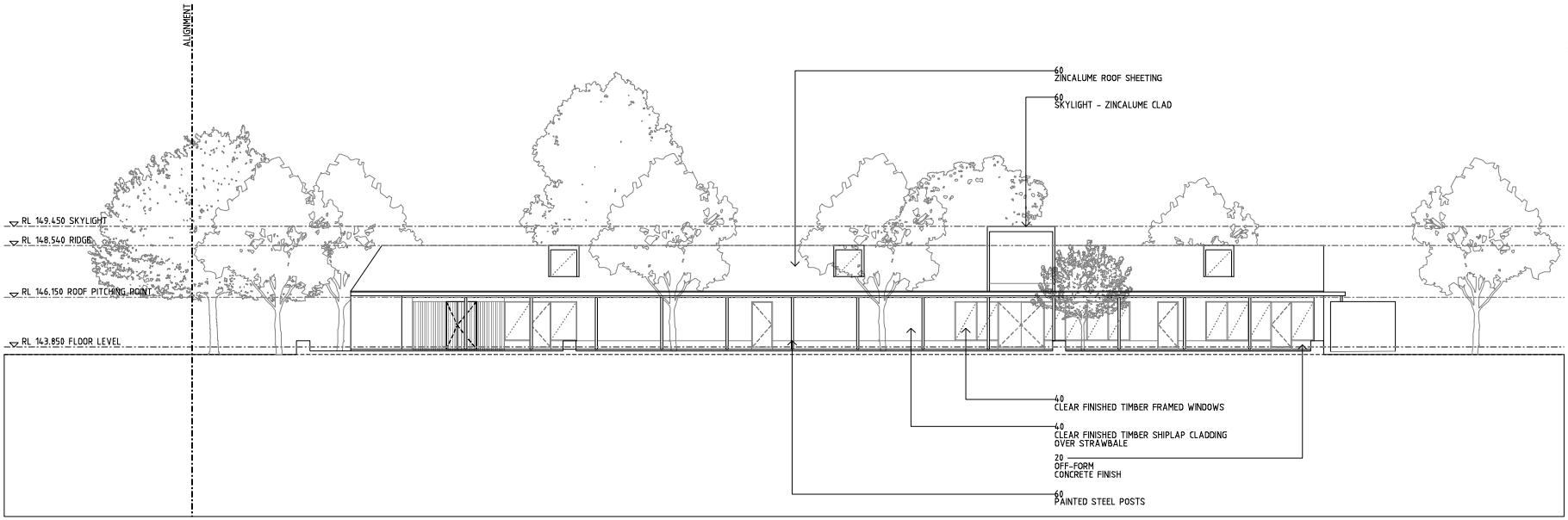
01 OUTDOOR SEATING	06 RETAIL SPACE	11 STAFF KITCHEN	16 STORE	21 ISOLATION WARD	26 EXERCISE YARDS
02 ENTRY FORECOURT	07 ADOPTION ROOM – CAT	12 SHARED STAFF OFFICE	17 IMPOUND RELEASES	22 SIDE ENTRY	27 FOOD PREP
03 MAIN ENTRANCE	08 ADOPTION ROOM – DOG	13 SMALL PROCEDURES EG. GROOMING, MICROCHIPPING	18 SECURE BREEZEWAY	23 VERANDAH	28 SIEZED AND STRAY ANIMAL KENNELS
04 STAFF AND RANGER ENTRY	09 UNISEX ACCESSIBLE WC	14 LAUNDRY (GENERAL)	19 CHEMICAL STORE	24 LAUNDRY (DIRTY) + HYDROBATH	29 ADOPTION AND PRIVATE BOARDING KENNELS
05 RECEPTION	10 MEETING ROOM + KITCHEN	15 CATTERY + ISOLATION	20 COOL ROOM	25 DEPOSIT PENS	30 LIVESTOCK IMPOUND AREA

DEVLOPMENT DATA	
RPD:	LOT 2 ON DP1243931
SITE AREA:	9,899m².
PROPOSED GFA:	382m² APPROX.
FLOOR SPACE RATIO:	4% APPROX.
CAR PARKING PROPOSED:	16
BUILDING HEIGHT	6m

Details

Conrad Gargett

Vokes and Peters



01 **Elevation 01**
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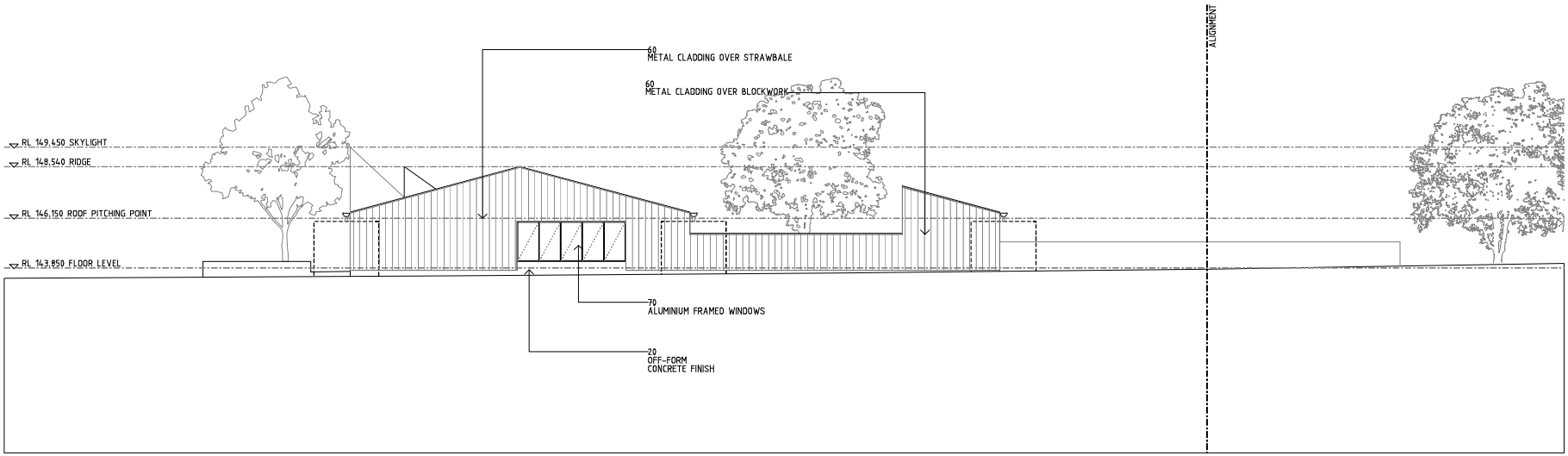

01 **Elevation 02**
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NOT FOR CONSTRUCTION

ALL SITE PLAN LAYOUTS, CONTOURS AND LEVEL INFORMATION IS ACCESSED FROM TYPE PTY LTD PLAN REFERENCE 18002-4A-1-1 AND AERIAL PHOTOGRAPHY. ACTUAL DIMENSIONS AND LAYOUTS MAY VARY SLIGHTLY FROM THOSE INDICATED.

THESE DESIGN DRAWINGS HAVE BEEN PREPARED FOR DEVELOPMENT APPROVAL ONLY AND WILL NEED TO BE SUPPLEMENTED WITH FURTHER DETAILED DESIGN AND SPECIFICATION BY CONSULTANT KEY SUB WELDING TRAFFIC, CIVIL, STRUCTURAL, HYDRAULIC, ELECTRICAL AND PLUMBING TOGETHER WITH BUILDING CODE FLOOD PLANNING, BUILDING CERTIFICATION AND ENERGY EFFICIENCY.

ALL LEVELS ARE INDICATIVE ONLY AND REQUIRE CORROBORATION WITH FLOOD CONSULTANTS PLANNING REPORT PRIOR TO BEING FINALISED.

Revision

Client
MUSWELLBROOK SHIRE COUNCIL

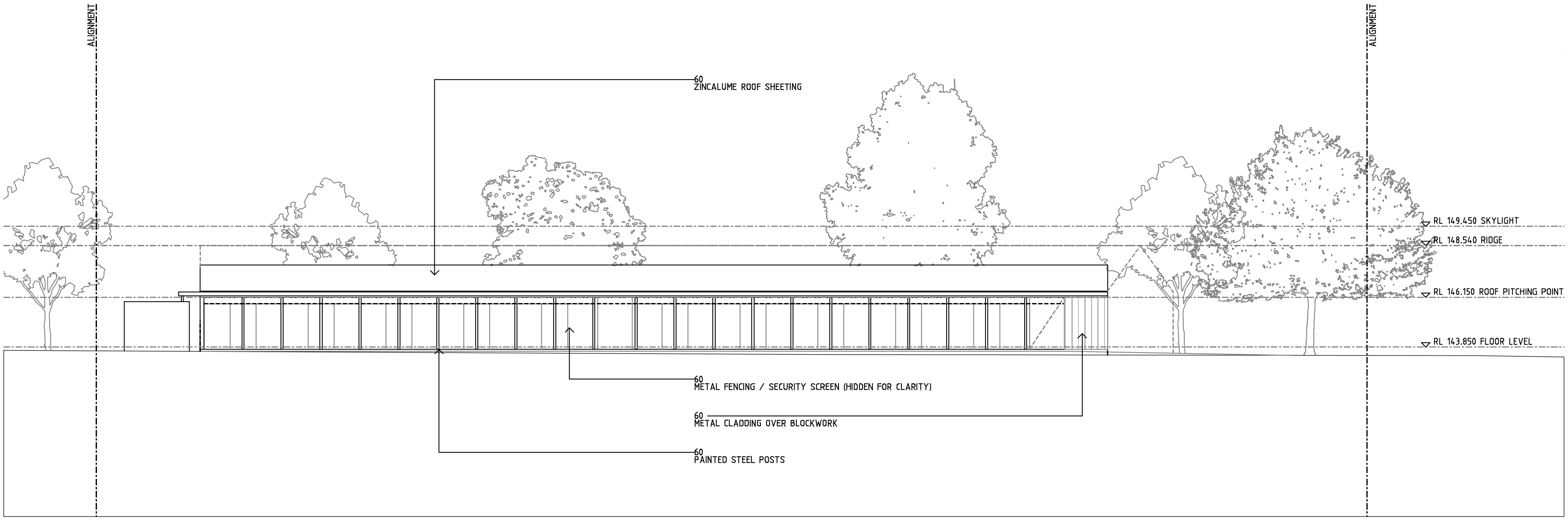
Project
MUSWELLBROOK ACF

Drawing
Elevations

PROJECT NO: 18666
DATE ISSUED: 3-Apr-20
DRAWING NO: DA10

DEVLOPMENT DATA	
RPD:	LOT 2 ON DP1243931
SITE AREA:	9,899m².
PROPOSED GFA:	382m² APPROX.
FLOOR SPACE RATIO:	4% APPROX.
CAR PARKING PROPOSED:	16
BUILDING HEIGHT	6m

Details



01 **Elevation 03**
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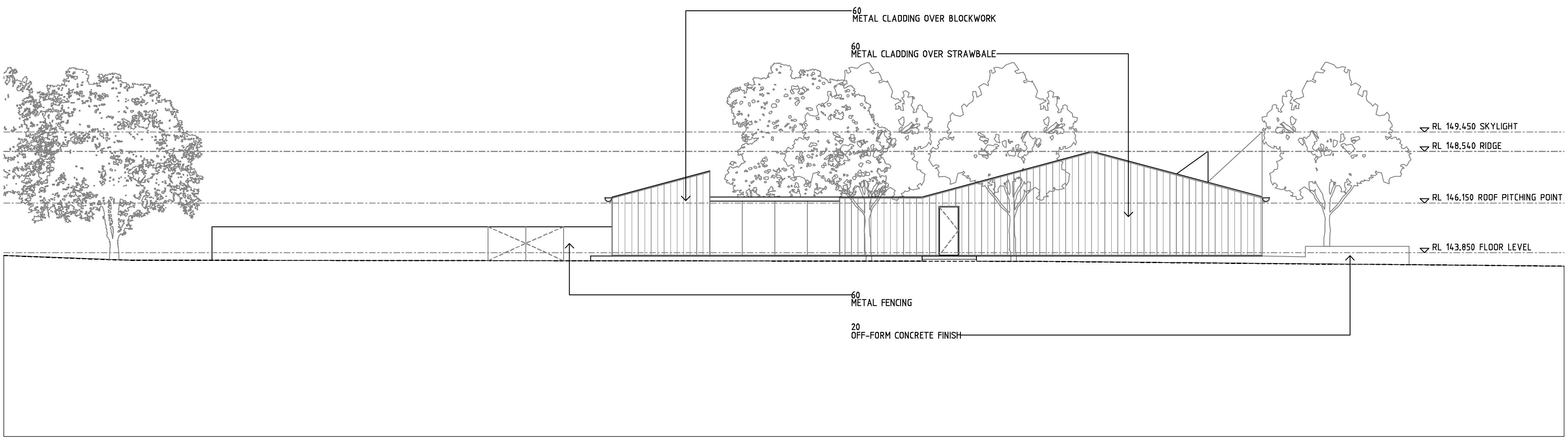

01 **Elevation 04**
1:100 @ A1

DEVLOPMENT DATA	
RPD:	LOT 2 ON DP1243931
SITE AREA:	9,899m²
PROPOSED GFA:	382m² APPROX.
FLOOR SPACE RATIO:	4% APPROX.
CAR PARKING PROPOSED:	16
BUILDING HEIGHT	6m

Conrad Gargett

Vokes and Peters

NOT FOR CONSTRUCTION

ALL SITE PLAN LAYOUTS, CONTOURS AND LEVEL INFORMATION IS ACCESSED FROM FYFE PTY LTD PLAN REFERENCE 90002-64-1-1 AND AERIAL PHOTOGRAPHY. ACTUAL DIMENSIONS AND LAYOUTS MAY VARY SLIGHTLY FROM THOSE INDICATED.

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ALL LEVELS ARE INDICATIVE ONLY AND REQUIRE COORDINATION WITH FLOOD CONSULTANTS PLANNING REPORT PRIOR TO BEING FINALISED.

Revision

Client
MUSWELLBROOK SHIRE COUNCIL

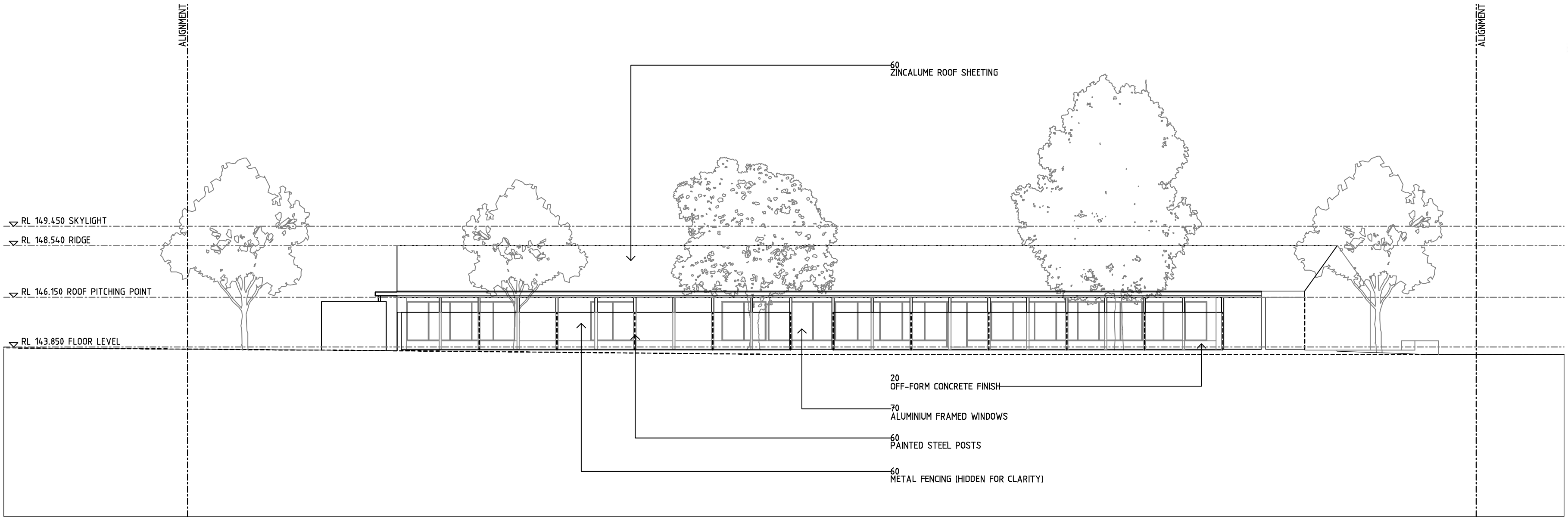
Project
MUSWELLBROOK ACF

Drawing
Elevations

PROJECT NO: 18666
DATE ISSUED: 3-Apr-20
DRAWING NO: DA11

Details

Nominated Architect : Lawrence Toaldo NSW Reg. 10255.



01 **Elevation 05**
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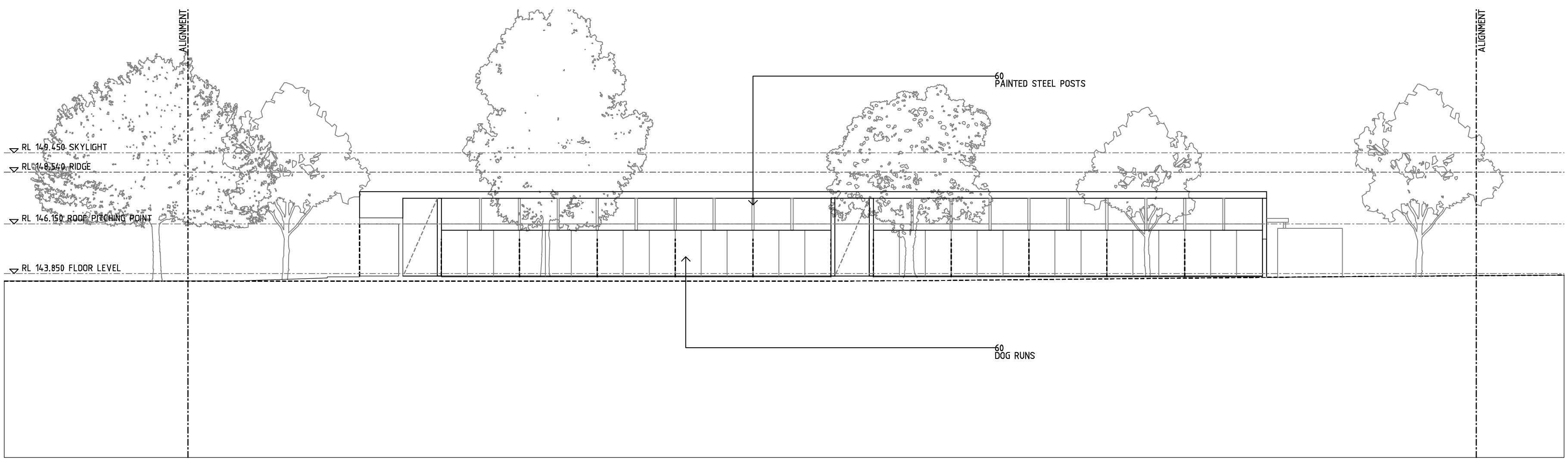

01 **Elevation 06**
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DEVLOPMENT DATA	
RPD:	LOT 2 ON DP1243931
SITE AREA:	9,899m².
PROPOSED GFA:	382m² APPROX.
FLOOR SPACE RATIO:	4% APPROX.
CAR PARKING PROPOSED:	16
BUILDING HEIGHT	6m

Conrad Gargett
Vokes and Peters

NOT FOR CONSTRUCTION

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Revision

Client
MUSWELLBROOK SHIRE COUNCIL

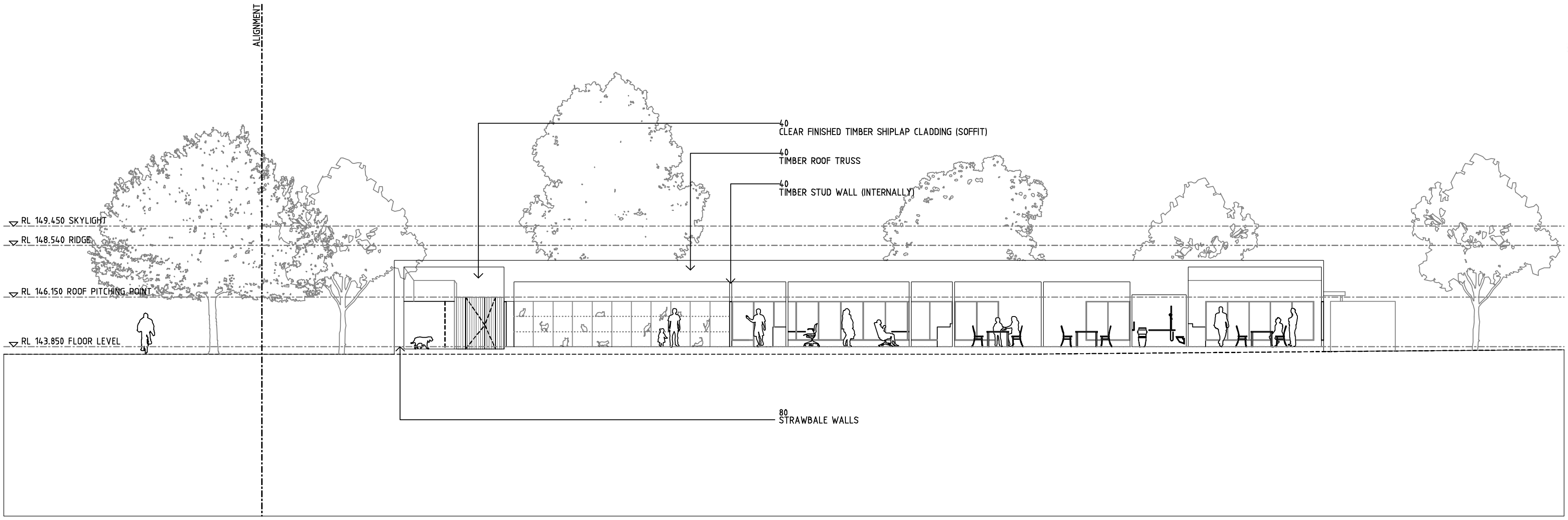
Project
MUSWELLBROOK ACF

Drawing
Elevations

PROJECT NO: 18666
DATE ISSUED: 3-Apr-20
DRAWING NO: DA12

Details

Do not scale this drawing and verify all dimensions and levels on site.
Nominated Architect : Lawrence Toaldo NSW Reg. 10255.



01 **Section 01**
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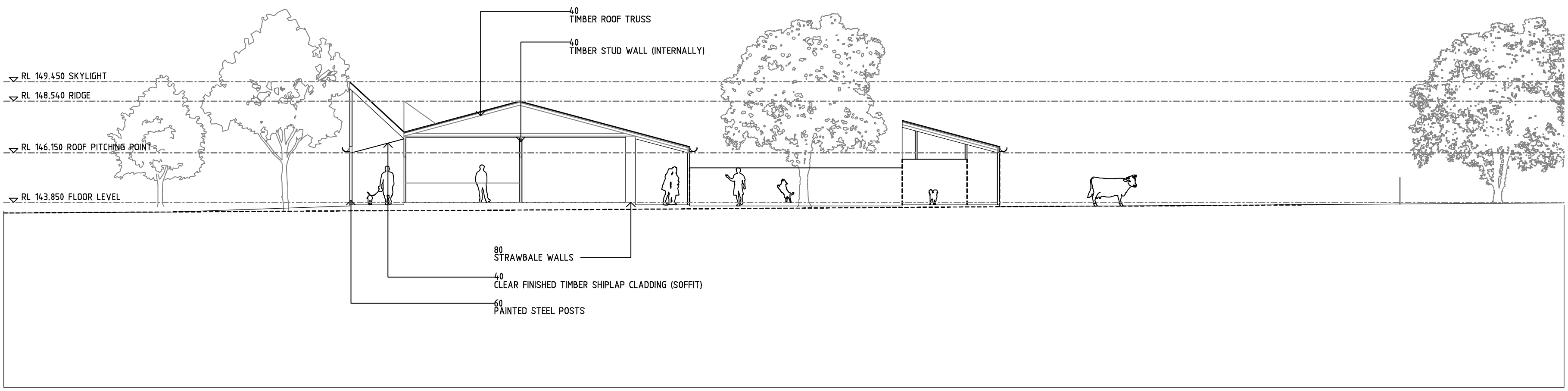

01 **Section 02**
1:100 @ A1

DEVLOPMENT DATA	
RPD:	LOT 2 ON DP1243931
SITE AREA:	9,899m²
PROPOSED GFA:	382m² APPROX.
FLOOR SPACE RATIO:	4% APPROX.
CAR PARKING PROPOSED:	16
BUILDING HEIGHT	6m

Conrad Gargett

Vokes and Peters

NOT FOR CONSTRUCTION

ALL SITE PLAN LAYOUTS, CONTOURS AND LEVEL INFORMATION IS ACCESSED FROM FYFE PTY LTD PLAN REFERENCE 90602-46-1-1 AND AERIAL PHOTOGRAPHY. ACTUAL DIMENSIONS AND LAYOUTS MAY VARY SLIGHTLY FROM THOSE INDICATED.

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Revision

Client

MUSWELLBROOK SHIRE COUNCIL

Project

MUSWELLBROOK ACF

Drawing

Sections

PROJECT NO: 18666
DATE ISSUED: 3-Apr-20
DRAWING NO: DA20

Details

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MAC
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