



Vipac Engineers and Scientists Limited
Level 2, 146 Leichhardt Street, Spring Hill, QLD 4000, Australia
PO Box 47, Spring Hill, Qld, 4000 Australia
t. +61 7 3377 0400 | e. brisbane@vipac.com.au
w. www.vipac.com.au | A.B.N. 33 005 453 627 | A.C.N. 005 453 627

Charter Hall

Flagstone Logistics Estate Lot 102 North Maclean Acoustics

Noise Impact Assessment

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2023/1466

Date: 11 October 2024



70B-23-0453-TRP-66176-2

18 June 2024

Job Title:	Flagstone Logistics Estate Lot 102 North Maclean Acoustics		
Report Title:	Noise Impact Assessment		
Document Reference:	70B-23-0453-TRP-66176-2		
Prepared For:	Prepared By:		
Charter Hall The Annex, Level 3/275 George St, The Annex, Level 3/275 George St, Brisbane, 4000, Brisbane, Qld, Australia, 4000	Vipac Engineers and Scientists Limited Level 2, 146 Leichhardt Street, Spring Hill, QLD 4000, Australia		
Contact: Erin Dyer - erin.dyer@charterhall.com.au Tel: 04486170450448617045	Tel: +61 7 3377 0400		
Author:	Michael Boulton 18 Jun 2024		Project Engineer
Reviewer:	Patrick Drake 18 Jun 2024		Senior Acoustic Consultant
Issued By:	Patrick Drake 18 Jun 2024		Senior Acoustic Consultant
Revision History:			
Rev. #	Comments / Details of change(s) made	Date	Revised by:
Rev. 00	Original issue	11 Dec 2023	
Rev. 01	Updated Site Design	22 Apr 2024	MB
Rev. 02	Updated Operational Information	18 Jun 2024	MB

NOTE: This report has been prepared solely for the benefit of the client to whom this report is addressed for use herein ("Client") unless otherwise agreed in writing by Vipac Engineers and Scientists Limited ACN 005 453 627 ("Vipac"). Neither the whole of this report or any part of it may be published, duplicated or circulated without the prior written approval of Vipac except as required by law. Vipac does not assume any responsibility or liability for any losses suffered as a result of the publication, duplication or circulation of this report and excludes all liability whatsoever to any third party who may use or rely on the whole, or any part of this report.

Vipac has prepared this report using all reasonable care, skill and due diligence within the time period, budget and resources allocated to Vipac as agreed with the Client. Vipac excludes all liability to the Client whatsoever, whether in whole or in part, for the Client's use or reliance on the report other than for the purposes set out in the report, or any matters outside the agreed scope of the work.

For the purposes of preparing this report, reliance has been placed upon the material, representations, information, and instructions provided to Vipac unless otherwise stated in the report. Originals of documents provided have not been required and no audit or examination of the validity of the documentation, representations, information, or instructions provided has been undertaken except to the extent otherwise stated in this report. Information and findings contained in this report are based on Vipac's interpretation of data collected.

This document contains commercial, conceptual, engineering, and other information that is proprietary to Vipac. The inclusion of this information in the report does not grant the Client any license to use the information without Vipac's prior written permission.

Executive Summary

This Noise Impact Assessment has been prepared on behalf of CH Hydrangea Pty Ltd (Applicant) in support of a development application over land at 4499-4651 Mount Lindesay Highway, North MacLean QLD 4280 and described as Lot 39 on SP258739 (site). This PDA Development Application seeks approval from the Minister of Economic Development Queensland for the following aspects of development:

- Development Permit for Reconfiguring a Lot - 1 into 6 Lots plus access easement; and
- Development Permit for a Material Change of Use for Warehouse (Distribution Centre).

This Noise Impact Assessment has also been prepared on behalf of the Applicant to support a development application over part of the site (Proposed Lot 102).

Based on the designated criteria, noise generated by the development was assessed at the nearest applicable receptor locations.

Noise generated by the development is predicted to comply with the assessment criteria with the implementation of practical noise management strategies. Compliance with the criteria outlined in Section 5 is predicted to be achieved based on the recommendations outlined in this report.

Table of Contents

1	Introduction	5
2	Project Location and Surrounding Area	5
3	Proposed Operations	7
4	Noise Monitoring	8
4.1	Previous Background Noise Monitoring Survey.....	8
5	Criteria	9
5.1	Logan City Council Planning Scheme	9
6	Noise Level Prediction	10
6.1	Noise Sensitive Receptors	10
6.2	Methodology and Assumptions	11
6.2.1	Reference Information	12
6.2.2	Noise Sources	12
6.2.3	Modelling Assumptions.....	12
7	Results.....	16
8	Preliminary Mechanical Plant Assessment	17
9	Recommendations	17
9.1	General Noise Management Strategies	17
9.2	Mechanical Plant Noise	17
10	Conclusion	17
	Appendix A Noise Contour Maps	18
	Appendix B Source Contribution Sample at Most Exposed NSR	22
	Appendix C 0.4BMT Sheet Metal R_w Prediction	23
	Appendix D Development Plans.....	24

1 Introduction

This Noise Impact Assessment has been prepared on behalf of CH Hydrangea Pty Ltd (Applicant) in support of a development application over land at 4499-4651 Mount Lindesay Highway, North Maclean QLD 4280 and described as Lot 39 on SP258739 (site). This PDA Development Application seeks approval from the Minister of Economic Development Queensland for the following aspects of development:

- Development Permit for Reconfiguring a Lot - 1 into 6 Lots plus access easement; and - Development Permit for a Material Change of Use for Warehouse (Distribution Centre).

This Noise Impact Assessment has also been prepared on behalf of the Applicant to support a development application over part of the site (Proposed Lot 102).

The assessment consisted of the following:

- Description of the project location and the surrounding area.
- Description of proposed acceptable operations.
- Applicable noise criteria for the project.
- Predicted potential noise levels from the project at the nearest property boundaries.
- Assessment of predicted noise levels against the noise criteria, and
- Noise mitigation recommendations where required.

Results were assessed against the noise emission standards for the Protection of General Amenity from Schedule 6 of the Logan City Council Planning Scheme 2015 criteria in the absence of specific criteria outlined in the Greater Flagstone PDA Development Scheme.

2 Project Location and Surrounding Area

The proposal is to develop the site at Lot 102 for a warehouse with an approximate GFA of 40,000m² on a total site area of 75,560m². The site is in the Greater Flagstone Priority Development Area and forms part of the Endorsed North Maclean Context Plan, with land surrounding the context plan area zoned primarily rural residential. The location of the project is shown in Figure 2-1 to Figure 2-3. The area can be classified as predominantly rural in nature.

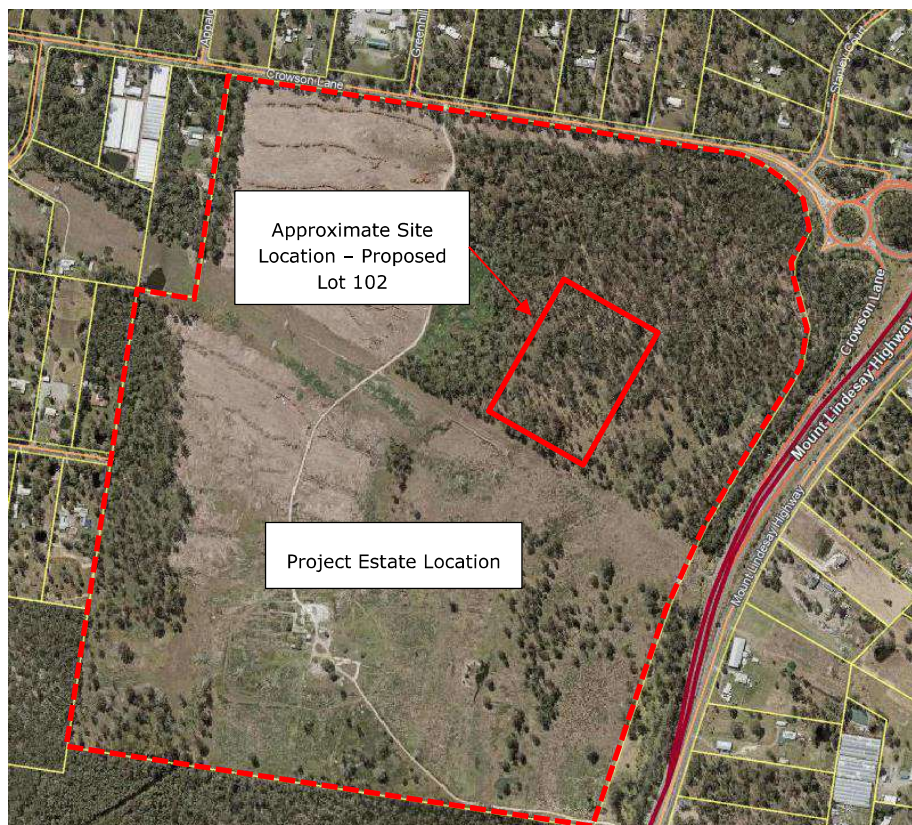


Figure 2-1 – Project Location



Figure 2-2 - Site Location and Surrounding Zoning

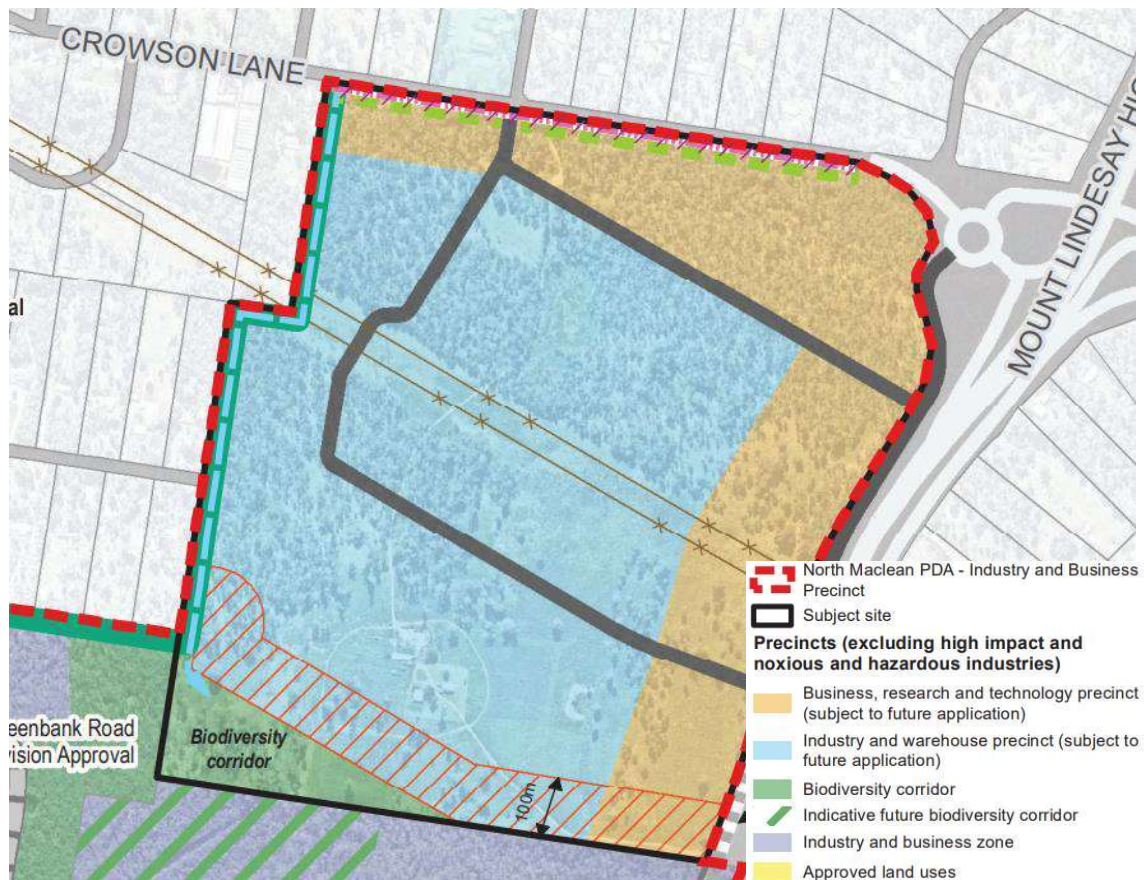


Figure 2-3 - Site Location and Proposed Precinct Zoning

The Endorsed North Maclean Context Plan indicates future precincts within the site, displayed in Figure 2-3.

3 Proposed Operations

The proposed development will consist of a single warehouse and associated main office, dock offices (x3), car parking and hardstand. The facility is proposed to operate 24 hours, 7 days a week. The proposed site layout has been provided and is shown below in Figure 3-1. Figure 2-3 shows the zoning of the site and surrounding area.

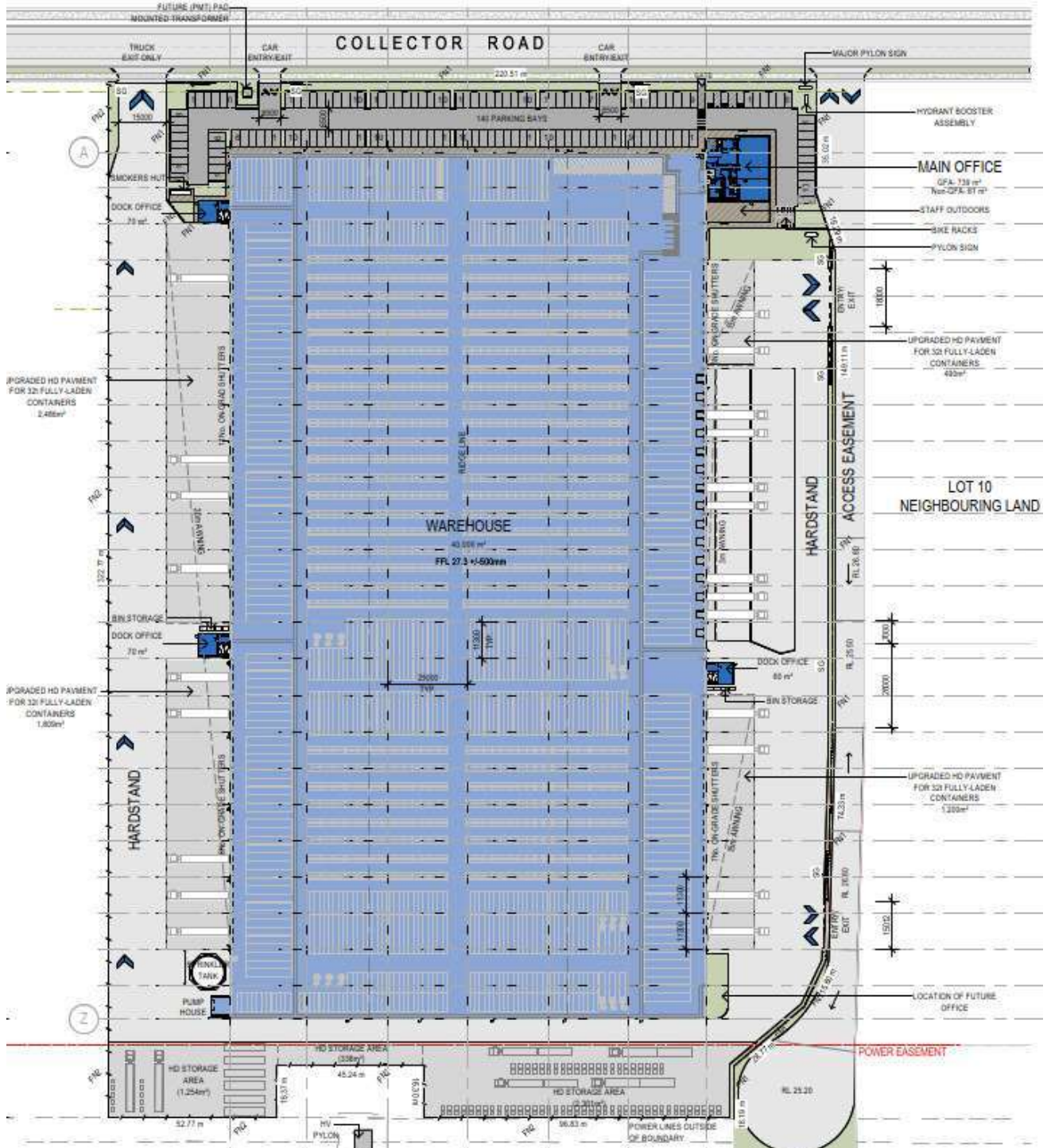


Figure 3-1 - Layout of the Project Facility

4 Noise Monitoring

4.1 Previous Background Noise Monitoring Survey

Noise monitoring of the surrounding environment was captured in a preliminary assessment of the master plan estate. The noise monitoring was conducted by Acoustics RB Pty Ltd (report ref: RB/22-1390.M01 dated 13th July 2022) between the 21st and 26th of June 2022, in the location shown in Figure 4-1.



Figure 4-1 - Previous Acoustics RB Noise Monitoring Location (Approx.)

The raw data from the noise monitoring was obtained from Charter Hall and processed in preparation for establishment with the appropriate criteria detailed in Section 5. The noise monitoring results processed by Vipac are shown in Table 4-1.

Table 4-1 - Monitoring Location Noise Levels

Dates	L _{Aeq}			L _{A10}			RBL			L _{A90}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
21/06/2022	48	44	45	50	47	47	-	33	28	40	37	40
22/06/2022	48	45	45	51	48	47	36	33	29	42	37	41
23/06/2022	50	45	45	52	48	47	35	35	28	42	37	40
24/06/2022	49	50	-	51	53	-	37	-	-	43	45	-
Total	49	46	45	51	49	47	36	33	28	42	41	40

5 Criteria

It is acknowledged that EDQ nor the Greater Flagstone PDA Development Scheme stipulate a specific noise criteria. In absence of this, this report will assess the proposed development against the criteria stated for the local government area the site is situated in – Logan City Council.

5.1 Logan City Council Planning Scheme

Schedule SC6.2.3 'Environmental Management' in the Logan City Council Planning Scheme 2015 stipulates noise emission standards for the protection of residential and general amenity. Table 3.2.1.1 – Noise emission standards for the protection of residential amenity stipulates the applicable criteria for the development and has been reproduced in Table 5-1. Table 3.2.1.2 – Noise emission standards for the protection of general amenity has been reproduced in Table 5-2.

Table 5-1 - Noise Emission Standards for the Protection of Residential Amenity

Noise level at the boundary of premises			
Noise type	Time period	Monday to Saturday	Sunday and public holidays
Non-steady sound*	Day 7:00am – 6:00pm	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$
	Evening 6:00pm to 10:00pm	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$
	Night 10:00 – 7:00am	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 0 \text{ dB(A)}$ and $L_{Amax} \leq 60\text{dB(A)}$	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 0 \text{ dB(A)}$ and $L_{Amax} \leq 60\text{dB(A)}$
Continuous noise*	Anytime	$L_{A90,T} \text{ plus } 0 \text{ dB(A)}$	$L_{A90,T} \text{ plus } 0 \text{ dB(A)}$

*As defined in AS1055.1 – 1997 Acoustics – Description and measurement of environmental noise.

Note – Adjustments for tonality and impulsiveness to be included in accordance with AS1055.1 – 1997 Acoustics – Description and measurement of environmental noise.

Table 5-2 - Noise Emission Standards for the Protection of General Amenity

Noise level at the boundary of premises			
Noise type	Time period	Monday to Saturday	Sunday and public holidays
Non-steady sound*	Day 7:00am – 6:00pm	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 10 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$
	Evening 6:00pm to 10:00pm	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 10 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$
	Night 10:00 – 7:00am	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$ and $L_{Amax} \leq 80\text{dB(A)}$	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$ and $L_{Amax} \leq 60\text{dB(A)}$
Continuous noise*	Anytime	$L_{A90,T} \text{ plus } 5 \text{ dB(A)}$	$L_{A90,T} \text{ plus } 5 \text{ dB(A)}$

*As defined in AS1055.1 – 1997 Acoustics – Description and measurement of environmental noise.

Note – Adjustments for tonality and impulsiveness to be included in accordance with AS1055.1 – 1997 Acoustics – Description and measurement of environmental noise.

Given the closest receptors are in residentially zoned properties, if the residential criteria can be achieved at these receptors, then all other receptors (residential or otherwise) are predicted to comply with the residential **and** general amenity criteria.

The noise levels from Table 4-1 have been used to determine the project noise criteria which has been tabulated in Table 5-3.

Table 5-3 – LCC Project Noise Criteria

Noise Type	Time period	Monday to Sunday inc. Public Holidays L_{Aeq} dB(A)*
Non-steady sound	Day 7:00am – 6:00pm	47 dB(A)
	Evening 6:00pm to 10:00pm	46 dB(A)
	Night 10:00 – 7:00am	40 dB(A) and $L_{Amax} \leq 60dB(A)$
Continuous noise	Day 7:00am – 6:00pm	42 dB(A)
	Evening 6:00pm to 10:00pm	41 dB(A)
	Night 10:00 – 7:00am	40 dB(A)

*The criterion for residential amenity is the same for Monday-Saturday and Sundays including public holidays.

6 Noise Level Prediction

6.1 Noise Sensitive Receptors

This assessment will focus on the nearest sensitive receptors outlined below and shown in Figure 6-1. It is acknowledged that while the LCC Planning Scheme Policy requires demonstration of compliance at the nearest adjoining premises (i.e. premises that share a common boundary, including premises that meet at a single point on a common boundary), only one boundary is shared with an adjoining premises (future use). For the purposes of a conservative assessment, the assessment will include assessment at all site boundaries (i.e. north, east, and west).

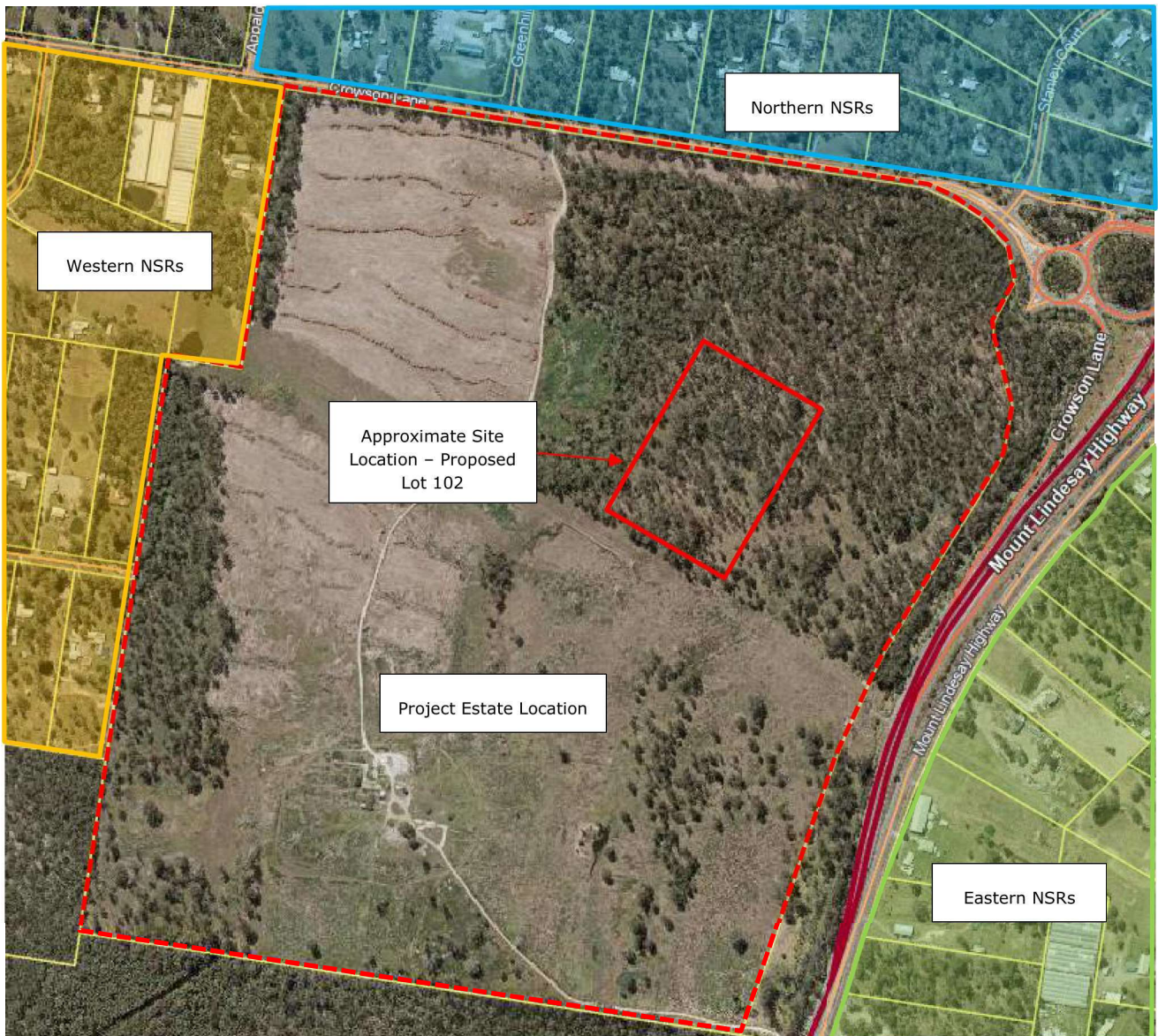


Figure 6-1 - Noise Sensitive Receptors

- Eastern NSRs:
 - 4524-4622 Mount Lindsay Highway.
- Northern NSRs:
 - 1-23 Stanley Court.
 - 61-109 Crowson Lane.
- Western NSRs:
 - 142-152 Crowson Lane.

6.2 Methodology and Assumptions

Noise modelling has been undertaken using the SoundPLAN 8.2 computational noise modelling software package. Vipac have undertaken numerous noise modelling and impact assessments previously using SoundPLAN for a range of projects, including infrastructure developments and industrial projects.

ISO 9613 has been used as the calculation methodology within the SoundPLAN noise model. ISO 9613 is an extensively used methodology around the world since it was published in 1996. Using this methodology within computer based noise modelling programs allows for precise calculations accounted for multiple sound transmission paths, reflections, screening/shielding, etc. Weather conditions which promote noise propagation (i.e. source to receptor wind directions) from part of the ISO 9613 methodology. Source to receptor winds however will not always occur, therefore prediction noise emissions during these conditions can be considered a worst case meteorological scenario.

6.2.1 Reference Information

Design drawings and information for the proposed facility were provided to Vipac for this assessment. The following drawings and specifications were used for the noise impact assessment:

- 'Site Plan – Drawing No. DA01', provided by Watson Young dated 31/05/2024.
- Design Levels TIN provided by Charter Hall dated 23/09/2023.
- 'Contour and Detail Survey, Rev C' by Walter Consulting Group "21-0432S-03" dated 11/04/2023; and
- Schedule 6 of the Logan City Council Planning Scheme 2015 (Version 8).

6.2.2 Noise Sources

Proposed equipment information for the site was provided by Charter Hall based on data provided by the proposed tenant. Noise levels from similar equipment associated with the proposed operations on site have been sourced from previous Vipac studies (unless stated otherwise) and were predicted at the NSR locations detailed in Section 6.1. Noise sources are shown below in Table 6-1, their locations shown in Figure 6-1, with detailed modelling assumptions provided in Section 6.2.3.

Table 6-1 - Equipment Sound Pressure Levels

Noise Source	Sound Pressure Level @ 1m L _{Aeq} dB(A)	Sound Pressure Level @ 1m L _{AMax} dB(A)
Passenger Vehicle Pass By	62	67
Passenger Vehicle Ignition	72	75
Passenger Vehicle Door Close ¹	77	84
Heavy Vehicle Pass-by (Semi-Trailer, B-Double, 20ft & 40ft containers)	80	89
Heavy Vehicle, Forklift & Container Lift Reverse Beeping ^{1,2}	94	101
Electric forklift (inside warehouse)	82	86
Gas forklift (outside warehouse)	92	94
Container Lift ³	96	100

¹ Includes 2 dB(A) adjustment to account for impulsiveness characteristics in accordance with AS1055.

² Includes 5 dB(A) adjustment to account for tonality characteristics.

³No make and model were provided by the client for a container lift (side loader). The data used for a container lift in the noise model is based on reach stacker measurements conducted by Marshall Day Acoustics (Report No. Rp 003 r01 2014432SY dated 22/02/2016).

Noise level predictions have been made at 1.5m above ground level.

6.2.3 Modelling Assumptions

For external vehicles, all noise generation assumptions for the site have been based on the traffic data provided by Charter Hall on behalf of the proposed tenant. Light vehicle traffic assumptions are summarised in Table 6-2.

Table 6-2: Light Vehicle Movements

Assumptions	Movements per Day		
	Day	Evening	Night
• 70 team members per 8 hour shift (3 shifts per day). • 2 vehicle movements per person (i.e. arriving and departing) in each time period to represent a worst case scenario. • Additional 3 movements in daytime period for visitors.	143	140	140

There are three types of noise sources to represent the noise from light vehicles:

- Light vehicle pass-bys are split evenly (33%) into three line sources as shown in Figure 6-2. Cars were assumed to be moving at a constant speed of 10 km/h with a source height of 0.5m.
- Car door slams occur for approximately 1 second for every light vehicle movement. They are modelled as point sources with a 1m source height.

- Car ignitions occur every car departure movement for approximately 2 seconds. They are modelled as point sources with a 0.5m source height.

Heavy vehicle traffic assumptions were provided by Charter Hall on behalf of the tenant and are reproduced in Table 6-3. These assumptions have been used to generate use patterns for heavy vehicle operations and the external forklifts and container lifts that load and unload the vehicles.

Table 6-3: Heavy Vehicle Movements

	Semi-Trailers	B-Double	40ft Container	20ft Container
Daily Movements	35	5	30	10
Loading/Unloading Movement Duration	60 mins	90 mins	60 mins	30 mins

There are two noise sources associated with heavy vehicle operations:

- Heavy vehicle pass-bys are based on the number of daily movements provided in Table 6 3 and the line source locations in Figure 6-2. The heavy vehicle pass-bys assume a 2m source height and 10 km/h constant speed for all truck types.
- Heavy vehicle reverse beepers are modelled as point sources with the following details:
 - 2m source height.
 - 20 second duration per truck movement (i.e. reversing into loading dock).
 - The 80 total daily truck movements have been distributed to the Eastern or Western façade based on the number of roller doors per façade as demonstrated below:
 - Western facade has 19 roller doors = 35 truck movements per day = 690s reverse beeps daily.
 - Eastern façade has 25 roller doors = 45 truck movements per day = 910s reverse beeps daily.
- Heavy vehicle movements (i.e. Heavy Rigid, B-Doubles, Semi-trailers) are inclusive of vehicles accessing the site for waste collection and sweep trucks for cleaning.

The loading and unloading of heavy vehicles generates three types of noises:

- The proposed tenant instructed there would be 10 gas forklifts operating on the hard stand (externally only) continuously, 24 hours a day:
 - Modelled as four line sources with a source height of 1.5m and operating speed of 10 km/h.
 - Distributed evenly into a total of four loops on the Eastern and Western façade of the warehouse to represent the average noise emissions from the areas where the gas forklifts and container lifts are most likely to be operating. Details of the routes can be found in Figure 6-2.
- Reverse beepers of the forklifts:
 - Modelled as four point sources, each located in the middle of a forklift loop on the eastern or western façade.
 - Occurring for 25% of the operational time of the 10 forklifts (i.e. for the total time the forklifts are operating, 25% of the time is assumed to be in reverse).
 - Source height of 2m, assuming beepers are located on the canopy of forklifts.
- Container lifts are used for 10 movements per day, as outlined by the tenant.
 - Each movement has been assumed to have a total duration of approximately 10 minutes of noise generating activity.
 - Modelled at 1.5m, distributed across four point source locations on the hardstand at each loading dock area.

Figure 6-2 presents the noise source locations overlaid on the site plan.

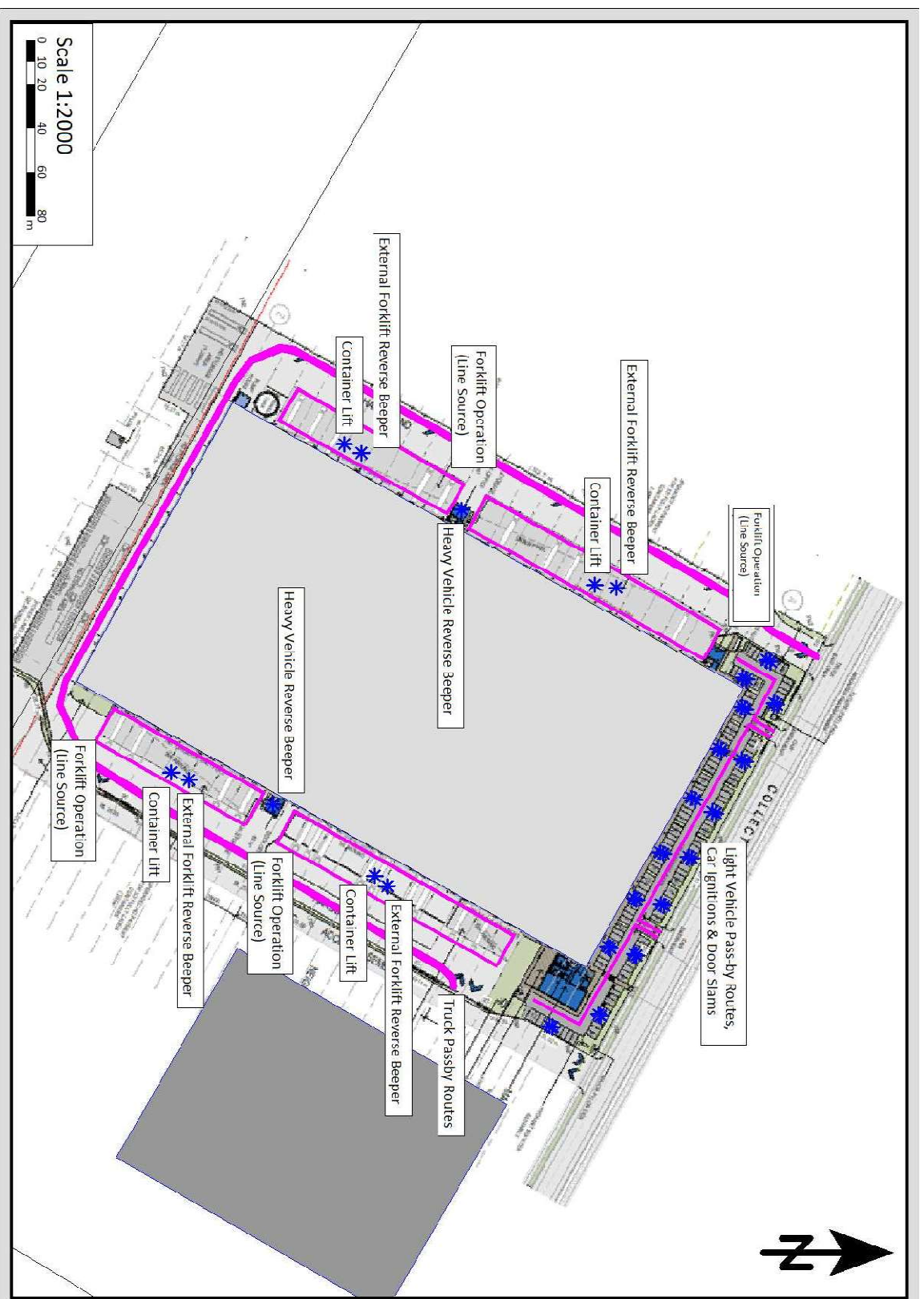


Figure 6-2 - Modelled Noise Source Locations

For all internal warehouse noise, the following information has been used in order to model a conservative operation assumption:

- Roof/Ceiling Material: It is assumed the warehouse construction and roof will be sheet metal, assumed to have a BMT (base metal thickness) of 0.42mm, which provides an approximate R_w rating of 18 (prediction shown in Appendix C).
- Wall Material: Vipac have assumed a standard concrete tilt panel wall construction up to 2.4m, with standard sheet metal façade to the roof with no insulation. For the purposes of a conservative assessment, all facades and roof has been modelled as sheet metal, providing an approximate R_w rating of 18 (prediction shown in Appendix C).
- Charter Hall have advised a total of 55 electric forklifts/stackers are expected to be used within the warehouse. All 55 have been dispersed evenly throughout the warehouse.
 - Electric forklift noise sources have been modelled as a point sources at 1.0m above ground.
 - All internal noise sources have been assumed to occur for 50% of the time during each time period.
- Floor: Concrete slab.
- The internal warehouse noise is a sum of all noise sources inside the entire area contributing to one diffusive noise environment.
- Roller doors have been modelled as open.
- Roller doors for the recessed loading dock area dimensions are approximately 3m wide and 3.5m high in accordance with the elevation drawings.
- Remaining roller doors are 6m wide and 6.5m high as per the elevation drawings.
- Building height is modelled to be approximately 14m as per elevation drawings.

7 Results

Worst case predicted noise emissions from Lot 102 have been compared against the noise criteria outlined in Section 5. The assessment has calculated all noise emissions **to the nearest property boundary**. The predicted noise levels at the property boundary are shown in Table 7-1.

Noise contour maps showing predicted noise level contour lines across the development have been included in Appendix . A noise source contribution sample at the most exposed NSR has also been included in Appendix D.

Table 7-1 - Predicted L_{Aeq} Noise Emissions

NSR	Predicted Equivalent Noise Level, L_{Aeq}			Predicted Maximum Noise, L_{Amax}
	Day	Evening	Night	Night
Criteria	47dB(A)	46dB(A)	40dB(A)	60dB(A)
1-23 Stanley Court	34	34	34	55
2-10 Stanley Court	35	35	35	55
51-59 Crowson Lane	37	37	37	58
61-69 Crowson Lane	37	38	38	58
71-79 Crowson Lane	38	38	38	58
81-89 Crowson Lane	37	37	37	56
91-99 Crowson Lane	37	37	37	56
101-109 Crowson Lane	37	37	37	55
141-147 Rosina Road	27	27	27	45
142-148 Rosina Road	28	29	28	48
142-152 Crowson Lane	35	35	35	51
4524-4534 Mount Lindesay Highway	21	23	22	48
4536-4542 Mount Lindesay Highway	21	22	21	46
4544-4554 Mount Lindesay Highway	21	22	21	46
4556-4564 Mount Lindesay Highway	22	22	22	47
4566-4574 Mount Lindesay Highway	24	24	24	52
4576-4584 Mount Lindesay Highway	34	34	34	54
4586-4600 Mount Lindesay Highway	37	37	37	56
4602-4622 Mount Lindesay Highway	38	38	38	54

Noise levels are predicted to comply during all time periods without the need for acoustic mitigation.

8 Preliminary Mechanical Plant Assessment

A reverse calculation was conducted to determine the allowable component noise source level of onsite mechanical plant prior to the inclusion of any potential acoustic treatment/screening. Mechanical plant is anticipated to operate 24/7.

The location of the mechanical equipment was assumed to be located on the nearest edge of the rooftop to the nearest receptor.

Based on the night time criteria detailed in Section 5 (i.e. 40db(A) for continuous noise for EDQ/LCC) and assessment to the nearest site boundary, the allowable mechanical noise levels without mitigation are presented in Table 8-1.

Table 8-1 - Mechanical Plant Predictions

NSR	Assumed Nearest Plant Location	Total allowable SPL @1m from the mechanical plant to achieve compliance, L_{eq} dB(A)
		Night
Nearest Site Boundary	Warehouse Rooftop	88

If compliance can be achieved at the assumed nearest plant location, then all other possible plant locations are expected to comply due to increased separation distance.

Acoustic treatment/screening of mechanical plant may result in higher allowable noise source levels. A detailed mechanical plant assessment should be conducted prior to the final selection of plant equipment. Compliance with the noise limits should then be checked once plant selections are finalised.

9 Recommendations

Noise generated by the proposed development has been assessed for compliance at the nearest property boundaries. The recommendations detailed below specify the treatment requirements for best practice management measures to ensure the potential for nuisance is minimised.

9.1 General Noise Management Strategies

The following management strategies are recommended to minimise noise annoyance:

- Any speed humps should be bitumen, concrete (as part of the slab), or rubber, not metal.
- Any grates or other protective covers in any hardstand area or access driveway must be rigidly fixed in position to eliminate clanging and be maintained.

Note – these recommendations do not imply that these activities will be inaudible at the boundary.

9.2 Mechanical Plant Noise

Because detailed plant selections are not available at this stage, it is not possible to carry out a detailed examination of the noise control measures that may be required to achieve the noise targets for mechanical plant.

Plant may need to be acoustically treated to achieve the criteria detailed in Section 5 to prevent noise emissions from adversely impacting the surrounding properties. This may include selecting the quietest plant possible, or treating the plant equipment with enclosures, barriers, duct lining, silencers, etc.

A mechanical plant noise assessment should be conducted by a suitably qualified acoustic consultant once plant selections are finalised.

10 Conclusion

Vipac has conducted a noise impact assessment for the proposed development Lot 102 of the Flagstone Industrial Estate in North Maclean. Potential noise emissions from the development were predicted to the nearest sensitive receptor locations and compared against the noise criteria as per Section 5. Noise levels are predicted to comply with the noise criteria with the implementation of the recommendations outlined in this report.

Appendix A Noise Contour Maps

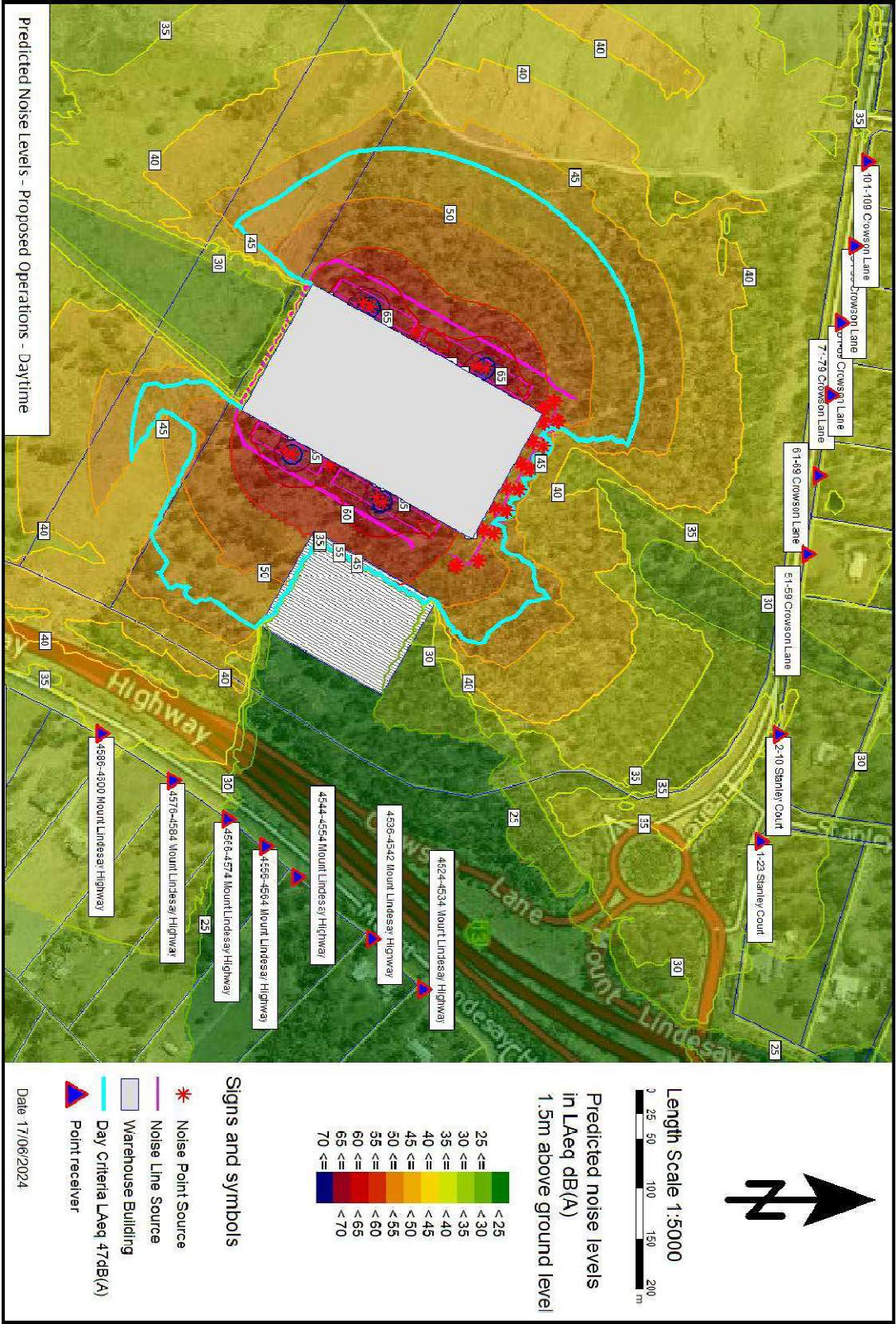


Figure A 1 - Predicted Daytime Noise Levels – EDQ/LCC

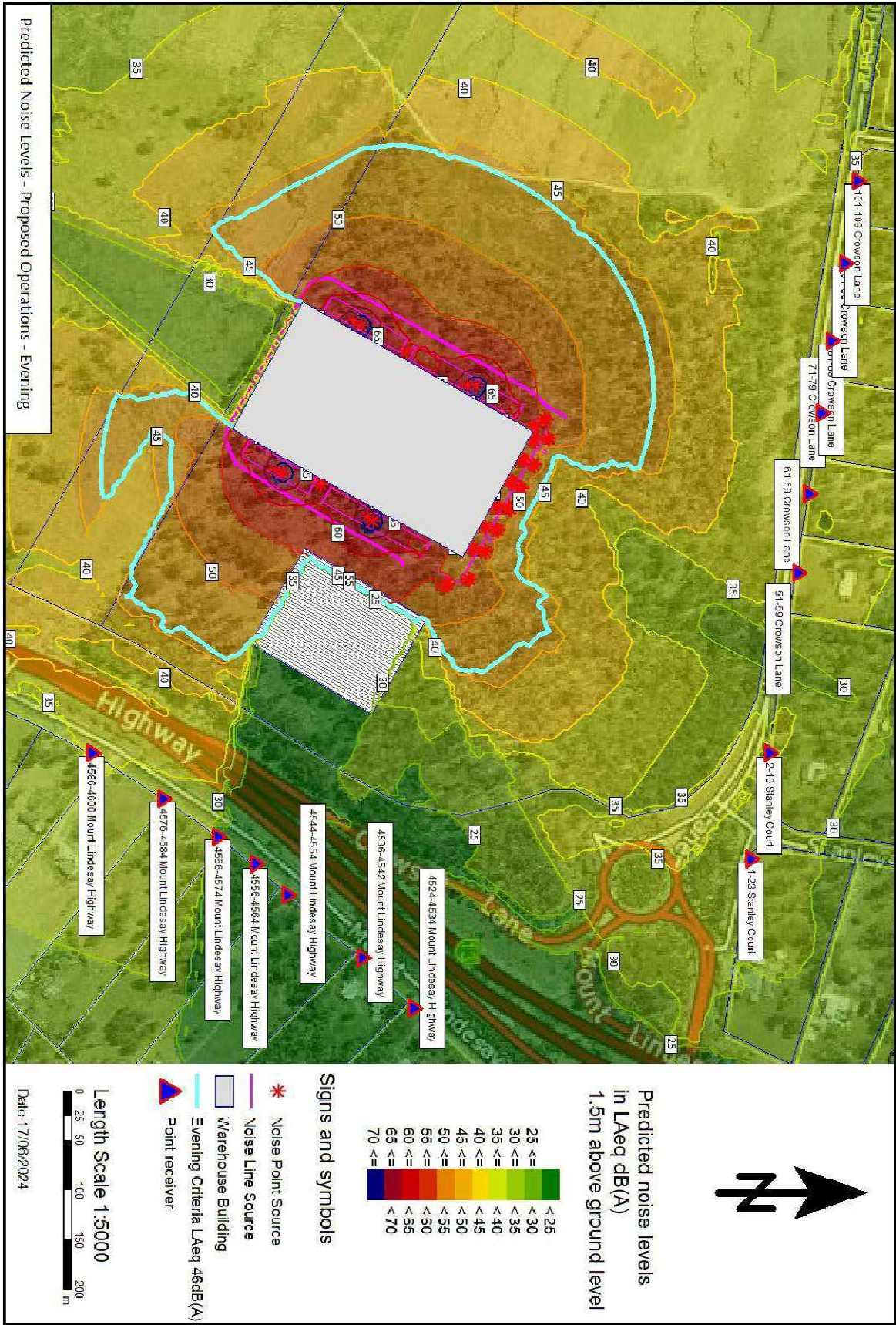


Figure A 2 - Predicted Evening Noise Levels – EDQ/LCC

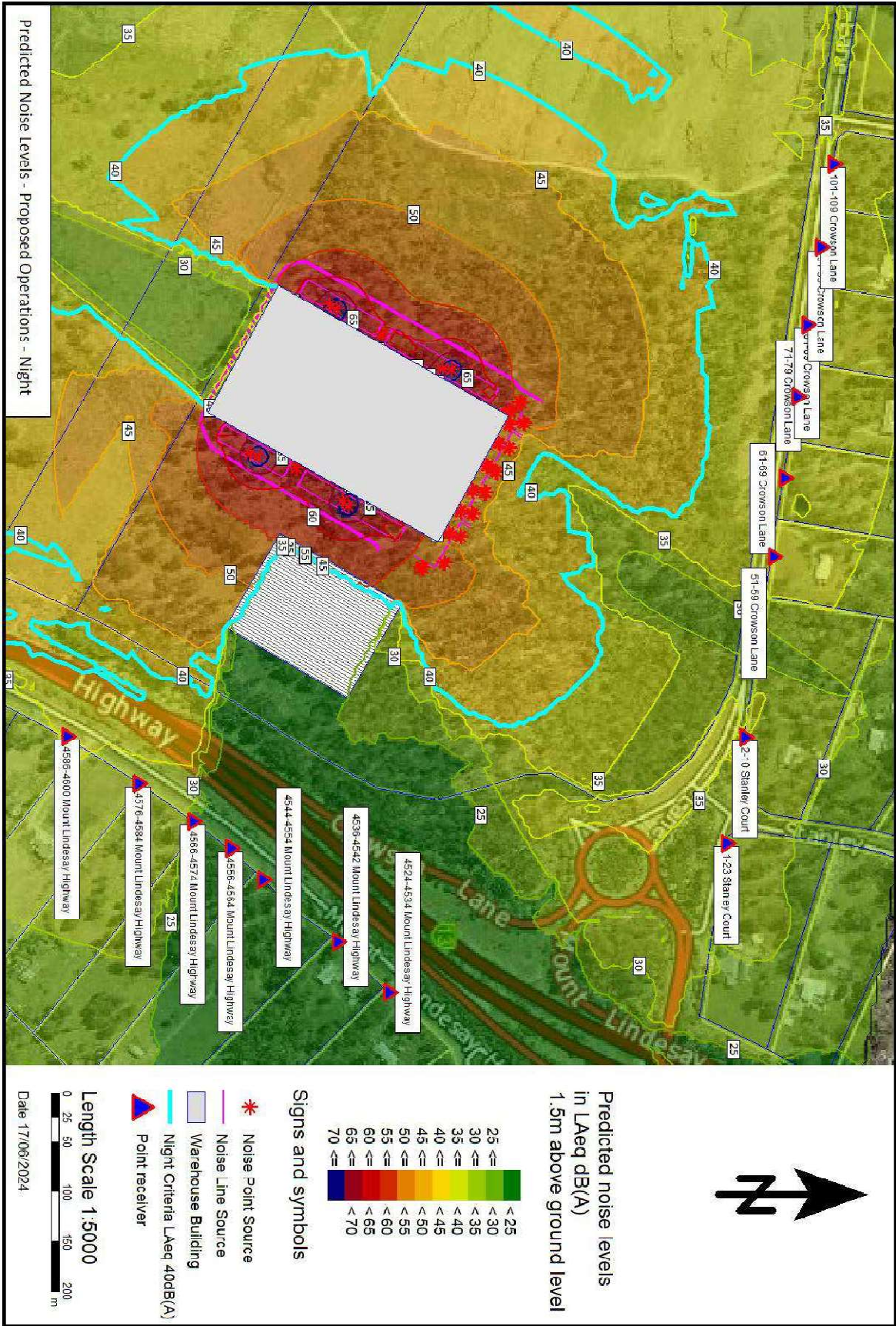


Figure A 3 Predicted Night-time Noise Levels – EDQ/LCC

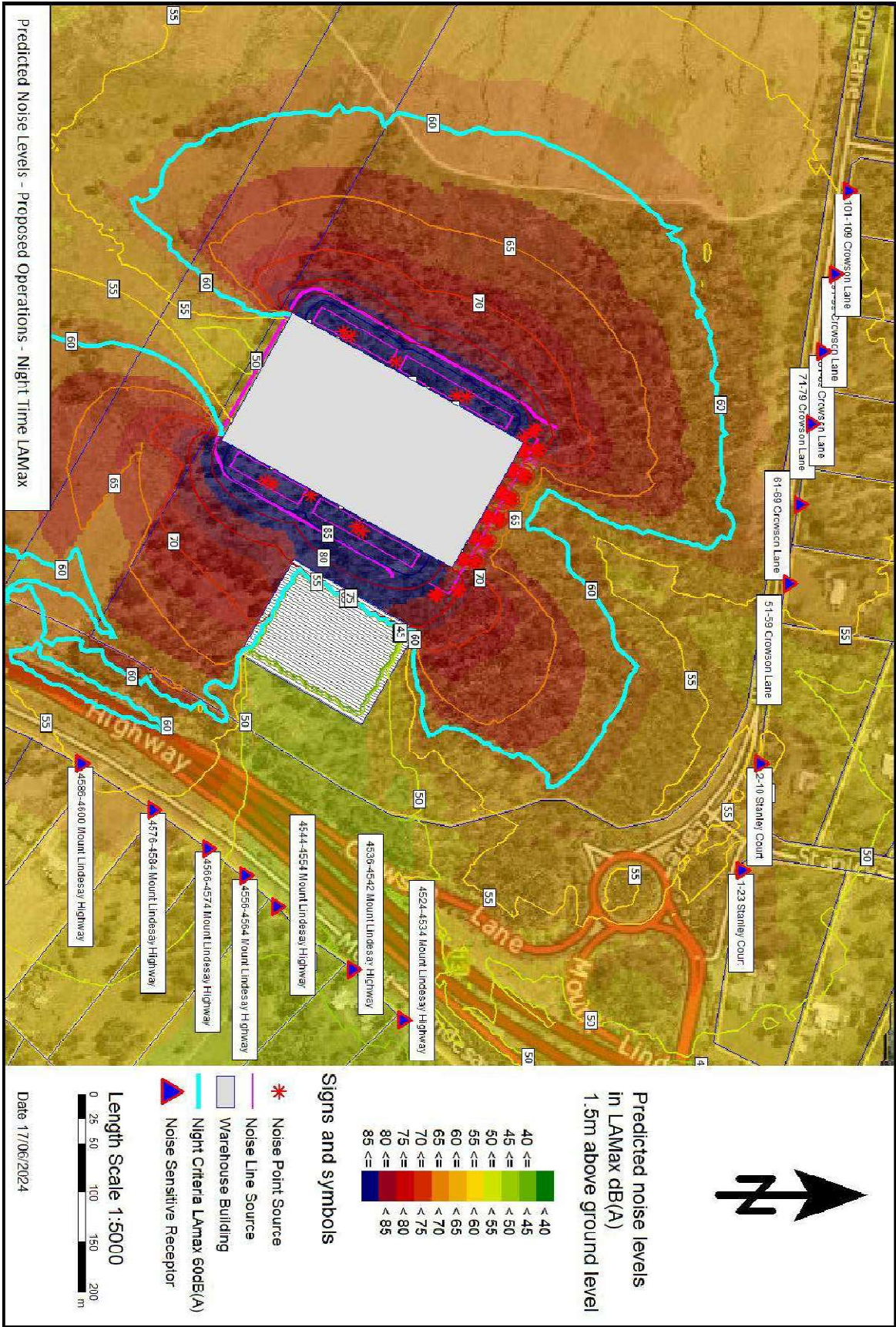


Figure A 4 - Predicted Night-time Noise Levels (LAMax) – EDQ/LCC

Appendix B Source Contribution Sample at Most Exposed NSR

Lot 102 Flagstone Estate, North Maclean Contribution level - June 2024 Lot 102 EDQ/LCC						9
Source	Source type	Ld dB(A)	Le dB(A)	Ln dB(A)	Lmax dB(A)	
Receiver 4802-4822 Mound Lindesay Highway FI GF		dB(A)	Lmax,lim dB(A)	dB(A)	dB(A)	Ld 37.5 dB(A) Lmax
Forklift Reverse Beeper East	Point	37.0		37.0		37.0 48.0
Forklift Reverse Beeper East	Point	24.5		24.5		24.5 33.6
External Container Lift East	Point	20.5		20.5		20.5 42.4
Truck Reverse Beeper East	Point	18.7		18.7		18.7 45.5
Eastern Forklift Line Source	Line	17.6		17.6		17.6 53.6
External Container Lift East	Point	16.9		16.9		16.9 38.7
Eastern Forklift Line Source	Line	15.1		15.1		15.1 51.1
Forklift Reverse Beeper West	Point	7.1		7.1		7.1 16.1
Forklift Reverse Beeper West	Point	5.7		5.7		5.7 14.7
Western Forklift Line Source	Line	-0.3		-0.3		-0.3 35.7
Western Forklift Line Source	Line	-0.4		-0.4		-0.4 35.6
40ft Container	Line	-2.7		-2.7		-2.7 16.9
Semi Trailer	Line	-2.9		-2.9		-2.9 16.0
External Container Lift West	Point	-4.0		-4.0		-4.0 17.9
External Container Lift West	Point	-8.3		-8.3		-8.3 13.3
20 ft Container	Line	-8.5		-8.5		-8.5 15.8
Car Ignition x 9	Point	-9.4		-5.1		-8.7 15.5
Car Ignition x 9	Point	-11.3		-7.0		-10.5 13.6
Car Door Closure x9	Point	-11.5		-7.2		-10.7 17.5
B Double	Line	-11.6		-11.6		-11.6 15.8
Car Ignition x 10	Point	-12.2		-7.9		-11.4 12.3
Truck Reverse Beeper West	Point	-12.5		-12.5		-12.5 15.4
Car Door Closure x9	Point	-13.0		-8.7		-12.2 15.9
Car Door Closure x10	Point	-13.7		-9.4		-13.0 14.7
Car Ignition x 10	Point	-16.1		-11.7		-15.3 8.4
Car Ignition x 10	Point	-16.1		-11.8		-15.4 8.3
Car Ignition x 10	Point	-16.6		-12.3		-15.8 7.8
Car Door Closure x10	Point	-18.0		-13.7		-17.2 10.4
Car Ignition x 7	Point	-18.1		-13.8		-17.3 6.4
Car Door Closure x10	Point	-18.3		-14.0		-17.5 10.1
Car Ignition x 6	Point	-18.3		-14.0		-17.6 7.1
Car Door Closure x10	Point	-18.5		-14.2		-17.7 9.9
Car Ignition x 6	Point	-18.8		-14.5		-18.0 7.9
Car Door Closure x7	Point	-19.4		-15.1		-18.6 9.0
Car Door Closure x10	Point	-19.6		-15.3		-18.8 8.9
Car Door Closure x9	Point	-19.7		-15.4		-18.9 9.2
Car Door Closure x10	Point	-19.9		-15.6		-19.1 8.5
Car Ignition x 10	Point	-20.1		-15.8		-19.3 4.4
Car Ignition x 10	Point	-20.1		-15.8		-19.3 4.4
Car Door Closure x8	Point	-20.1		-15.8		-19.4 10.5
Car Ignition x 10	Point	-20.2		-15.9		-19.4 4.3
Car Ignition x 9	Point	-20.2		-15.9		-19.4 4.7
Car Door Closure x10	Point	-20.3		-16.0		-19.5 8.1
Car Door Closure x8	Point	-20.4		-16.1		-19.7 9.0
Vipac Engineers & Scientists Pty Ltd						55

SoundPLAN 8.2

Appendix C 0.4BMT Sheet Metal R_w Prediction

Sound Insulation Prediction (v9.0.20)

Program copyright Marshall Day Acoustics 2017.

Margin of error is generally within ± 3 dB.

Key No: 1309

Job Name:

Job No:

Date: 25/09/2023

File Name:

Insulapredict

Notes:



R_w	18 dB
C	0 dB
Ctr	-2 dB

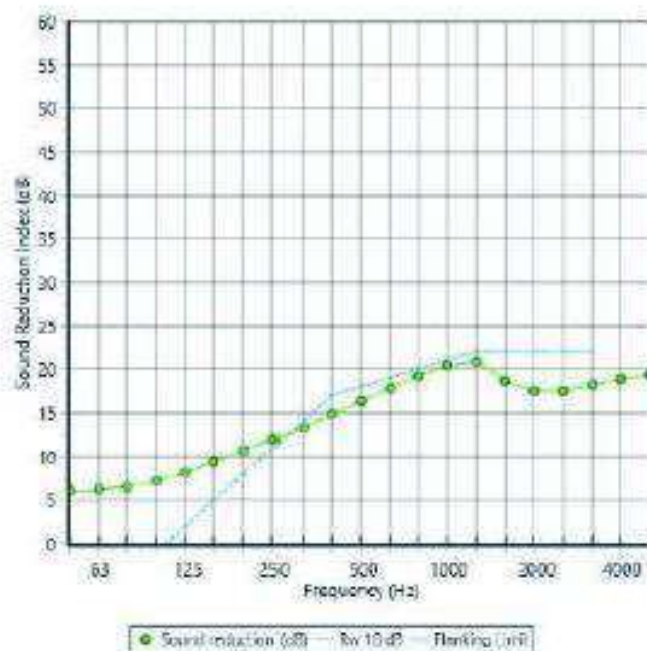
Panel Size: 2.7m x 4.0m

Panel surface mass: 0.12 kg/m²

System description

Panel 1: 1.5 x 0.3 mm Custom G6 (0.05mm)

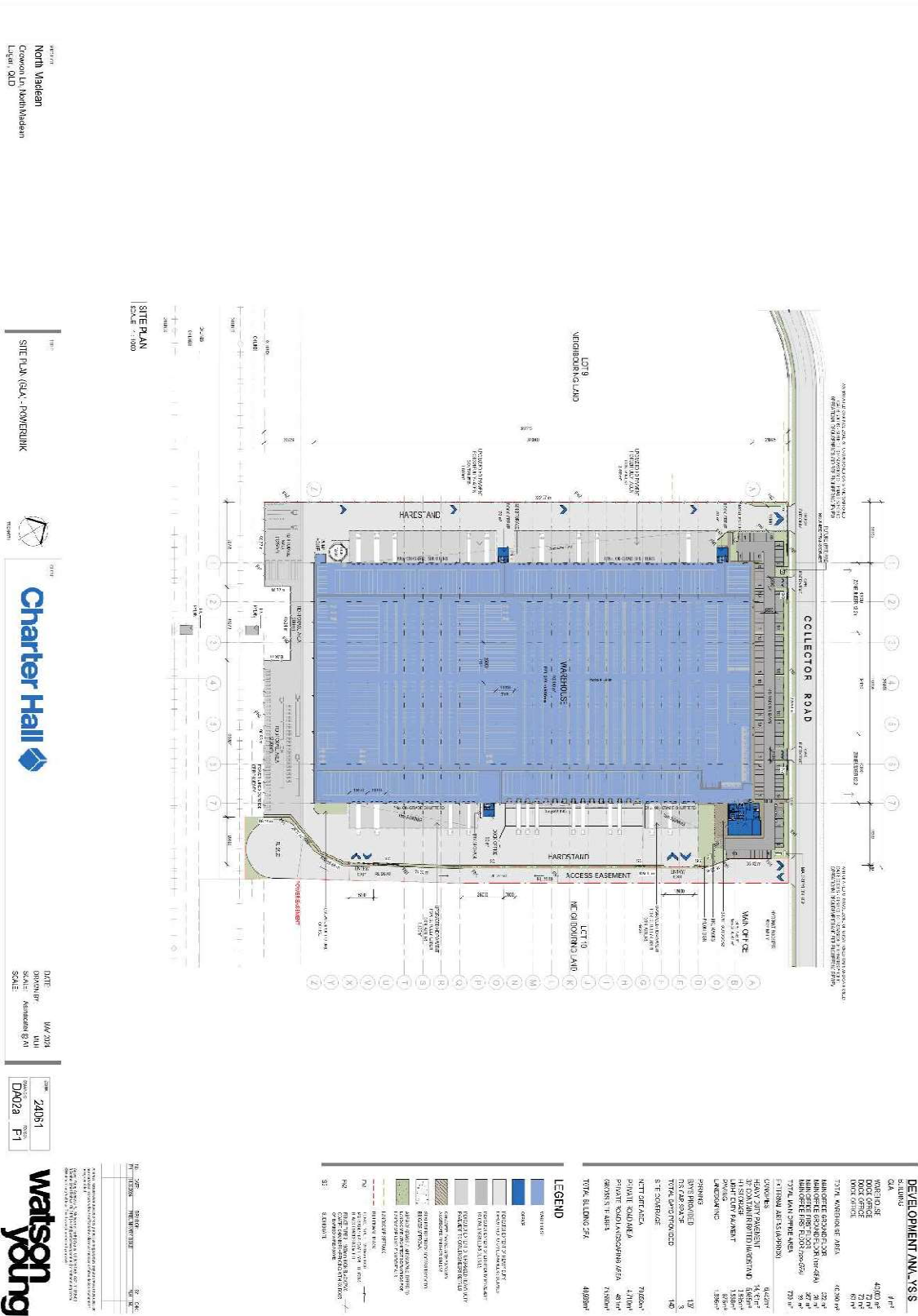
freq (Hz)	R (dB)	R (dB)
50	6	
63	6	6
80	7	
100	7	
125	8	8
160	9	
200	11	
250	12	12
315	13	
400	15	
500	16	16
630	18	
800	19	
1000	20	20
1250	21	
1600	19	
2000	18	18
2500	18	
3150	18	
4000	19	19
5000	19	

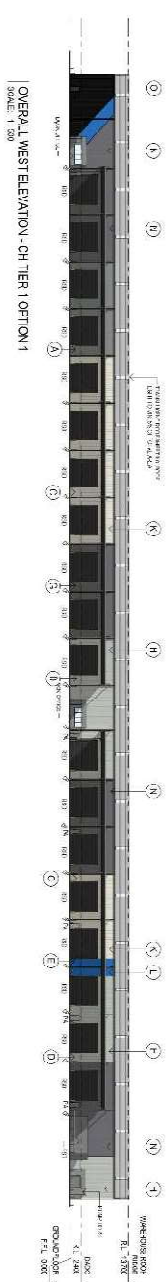
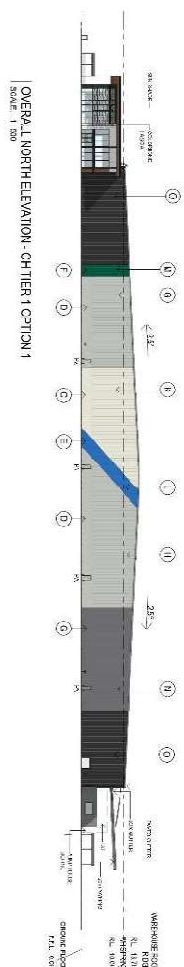
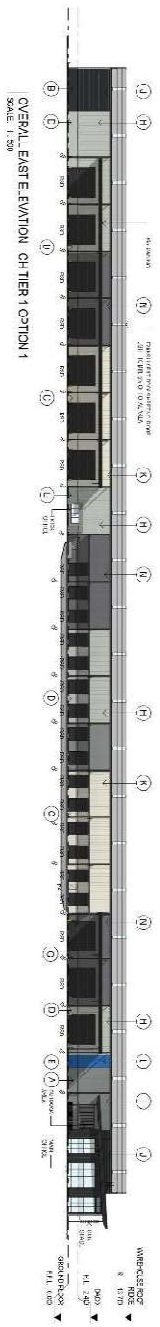
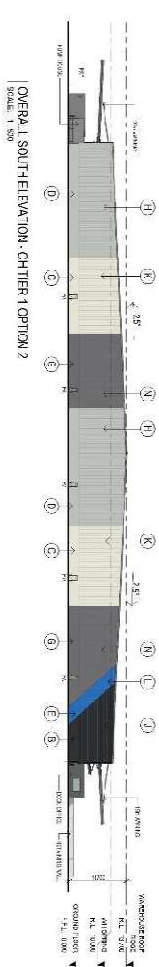




Appendix D Development Plans

Charter Hall
Flagstone Logistics Estate Lot 102 North Maclean Acoustics
Noise Impact Assessment





PROPOSED EXTERNAL FINISHES	
A	PERAL DOOR/SLIDE WINDOW
B	PANEL, SAND FINISH
C	PANEL, SAND FINISH
D	PANEL, SAND FINISH
E	PANEL, SAND FINISH
F	PANEL, SAND FINISH
G	PANEL, SAND FINISH
H	PANEL, SAND FINISH
I	PANEL, SAND FINISH
J	PANEL, SAND FINISH
K	PANEL, SAND FINISH
L	PANEL, SAND FINISH
M	PANEL, SAND FINISH
N	PANEL, SAND FINISH
O	PANEL, SAND FINISH
P	PANEL, SAND FINISH
Q	PANEL, SAND FINISH
R	PANEL, SAND FINISH
S	PANEL, SAND FINISH

PROJECT
North Maclean
Charter Hall North Maclean
Logan, QLD

SCALE
1:500

DATE
24/06/24

DRAWN BY
DADs P8

DATE
24/06/24

SCALE
1:500

DATE
24/06/24

SCALE
1:500

Charter Hall

24/06/24

DADs P8

watson young

24/06/24

DADs P8