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Charter Hall

Lot 104 Flagstone Logistics Estate, North Maclean

Noise Impact Assessment

70B-24-0491-TRP-82422-1

13 September 2024

Job Title:	Lot 104 Flagstone Logistics Estate, North Maclean
Report Title:	Noise Impact Assessment
Document Reference:	70B-24-0491-TRP-82422-1

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Rev. #	*Comments / Details of change(s) made*	*Date*	*Revised by:*
Rev. 00	Original issue	26 Aug 2024	
Rev. 01	Updated Introduction	10 Sep 2024	MB

Executive Summary

This Noise Impact Assessment Report 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 for the following aspects of development:

- Development Permit for Reconfiguring a Lot - 1 into 5 Lots, plus balance lot and access easements; and
- Development Permit for a Material Change of Use for Warehouse (Distribution Centre).

The material change of use aspect of the proposed development seeks approval for a warehouse (distribution centre) to enable the construction of one of the first buildings within the Flagstone Logistics Estate. The tenant at this stage is confidential, and therefore development approval is sought for a confidential tenant. The proposed warehouse will be located on Proposed Lot 104 and is intended to service as a distribution centre for the tenant, for the receival, warehousing, storing and distribution of products.

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

This Noise Impact Assessment Report 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 for the following aspects of development:

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The material change of use aspect of the proposed development seeks approval for a warehouse (distribution centre) to enable the construction of one of the first buildings within the Flagstone Logistics Estate. The tenant at this stage is confidential, and therefore development approval is sought for a confidential tenant. The proposed warehouse will be located on Proposed Lot 104 and is intended to service as a distribution centre for the tenant, for the receival, warehousing, storing and distribution of products. 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.

2 Project Location and Surrounding Area

The proposal is to develop the site at Lot 104 for a warehouse with a GFA of 43,956m^2 (including office space) on a total site area of 78,698m^2. 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

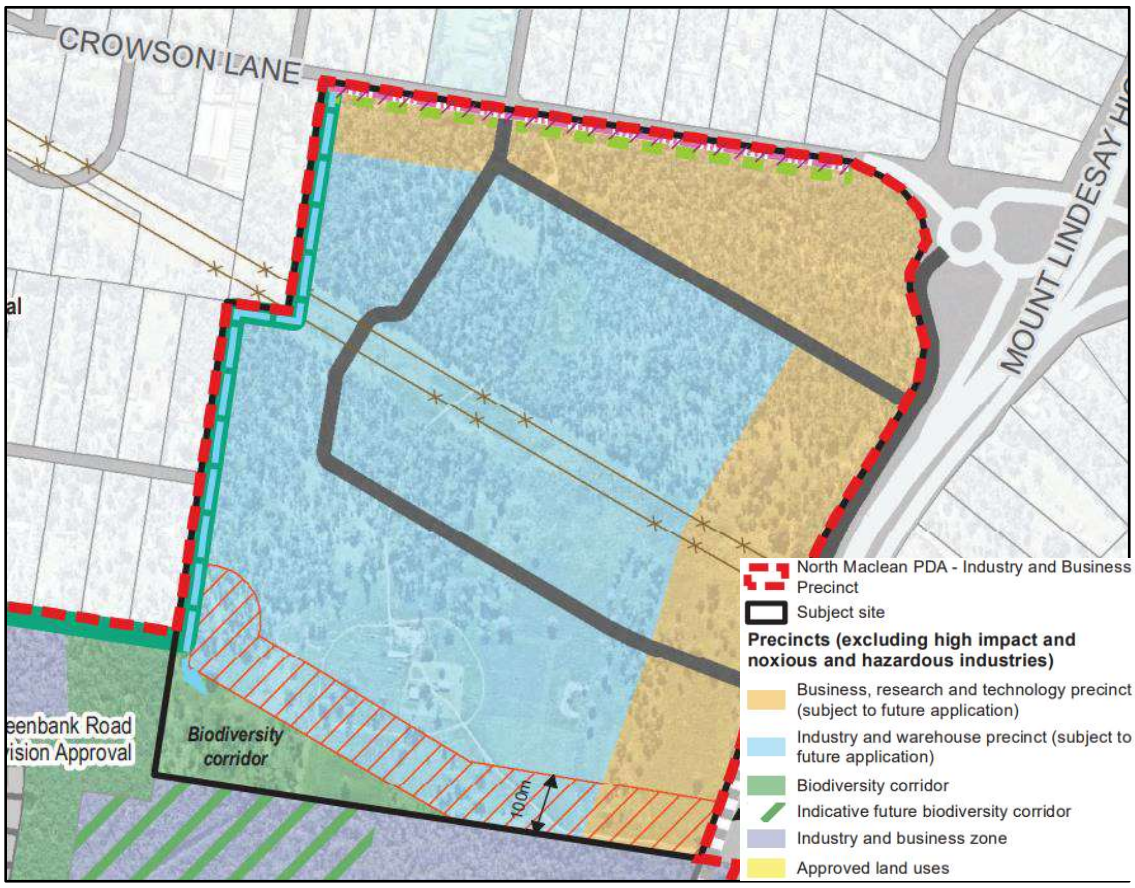


Figure 2-3 - Site Location and Proposed Precinct Zoning

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 offices, 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 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.

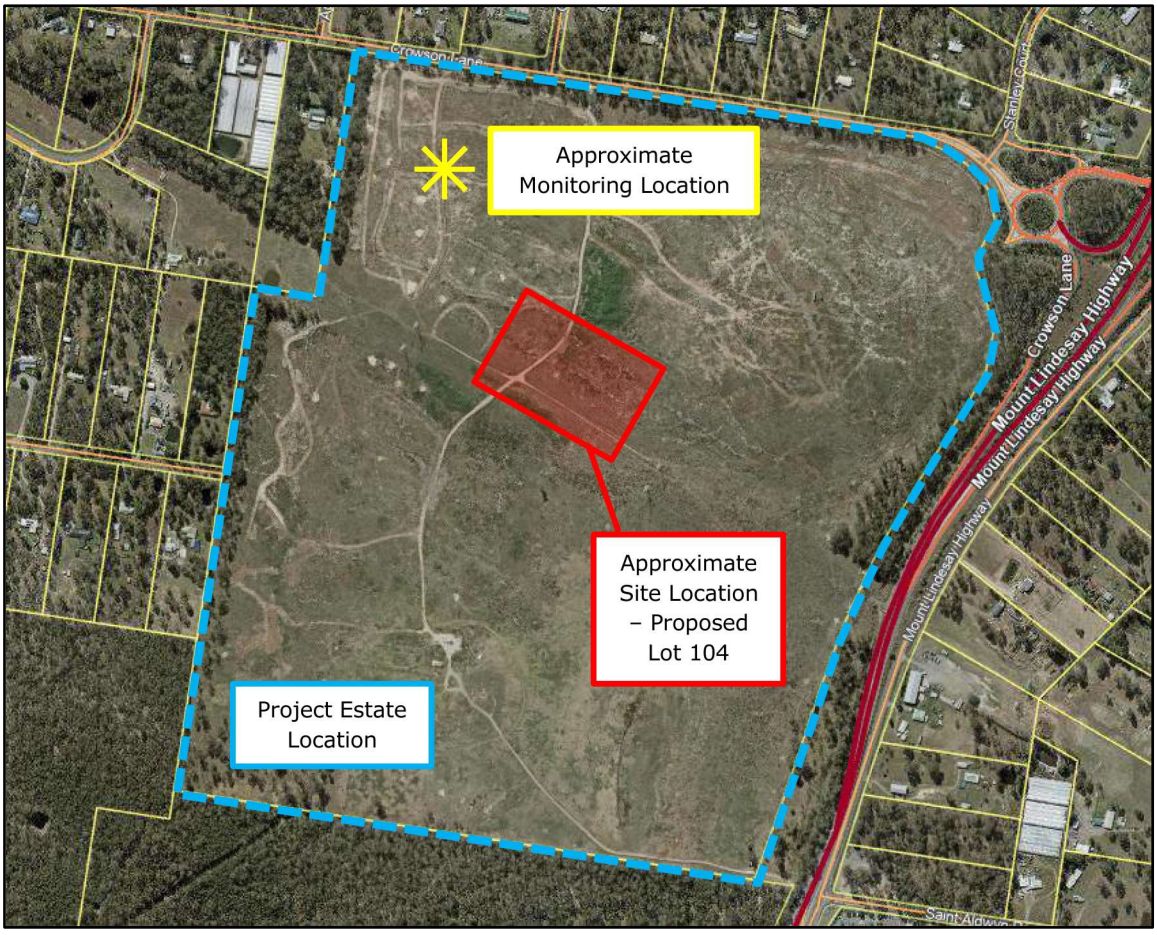


Figure 4-1 - Previous Acoustics RB Noise Monitoring Location (Approx.)

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

5.1 EDQ

It is acknowledged that EDQ does not 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.

5.2 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 to 6:00pm	$L_{Aeq,adj,T} \leq L_{A90}$ plus 5 dB(A)	$L_{Aeq,adj,T} \leq L_{A90}$ plus 5 dB(A)
	Evening 6:00pm to 10:00pm	$L_{Aeq,adj,T} \leq L_{A90}$ plus 5 dB(A)	$L_{Aeq,adj,T} \leq L_{A90}$ plus 5 dB(A)
	Night 10:00pm to 7:00am	$L_{Aeq,adj,T} \leq L_{A90}$ plus 0 dB(A) and $L_{Amax} \leq$ 60dB(A)	$L_{Aeq,adj,T} \leq L_{A90}$ plus 0 dB(A) and $L_{Amax} \leq$ 60dB(A)
Continuous noise*	Anytime	$L_{A90,T}$ plus 0 dB(A)	$L_{A90,T}$ plus 0 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 to 6:00pm	$L_{Aeq,adj,T} \leq L_{A90}$ plus 10 dB(A)	$L_{Aeq,adj,T} \leq L_{A90}$ plus 5 dB(A)
	Evening 6:00pm to 10:00pm	$L_{Aeq,adj,T} \leq L_{A90}$ plus 10 dB(A)	$L_{Aeq,adj,T} \leq L_{A90}$ plus 5 dB(A)
	Night 10:00pm to 7:00am	$L_{Aeq,adj,T} \leq L_{A90}$ plus 5 dB(A) and $L_{Amax} \leq$ 80dB(A)	$L_{Aeq,adj,T} \leq L_{A90}$ plus 5 dB(A) and $L_{Amax} \leq$ 60dB(A)
Continuous noise*	Anytime	$L_{A90,T}$ plus 5 dB(A)	$L_{A90,T}$ plus 5 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 to 6:00pm	47 dB(A)
	Evening 6:00pm to 10:00pm	46 dB(A)
	Night 10:00pm to 7:00am	40 dB(A) and L_{Amax} ≤ 60dB(A)
Continuous noise	Day 7:00am to 6:00pm	42 dB(A)
	Evening 6:00pm to 10:00pm	41 dB(A)
	Night 10:00pm to 7:00am	40 dB(A)

**The criteria 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 (approved 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.
  - 141-148 Rosina Road.

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.

Noise level predictions have been made at 1.5m above ground level at the nearest property boundaries as per the LCC Project Specific Criteria in Section 5.

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 (GFA), PDA DEVELOPMENT SCHEME', Preliminary Issue Revision, provided by Watson Young dated 11/09/2024 (refer to Appendix D).
- 'Tenant Fit-Out Plan' provided by Charter Hall on 19/08/2024 (Appendix D).
- 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.
- 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 a detailed understanding of the intended tenant. Noise levels from similar equipment associated the proposed operations on site have been sourced from previous Vipac studies unless stated otherwise. Noise sources are shown below in Table 6-1 and detailed modelling assumptions are provided in Section 6.2.3. Noise source locations are shown in Figure 6-2 and Figure 6-3.

Table 6-1 - Equipment Sound Pressure Levels

Category	Noise Source	Sound Pressure Level (SPL) @1m L_{Aeq} dB(A)	Sound Pressure Level (SPL) @1m L_{AMax} dB(A)
Light Vehicle Noise	Passenger Vehicle Pass By	62	67
	Passenger Vehicle Ignition	72	75
	Passenger Vehicle Door Close[2]	77	84
Heavy Vehicle Noise	Heavy Vehicle Passby	80	89
	Heavy Vehicle Reverse Beeping[2,3]	94	101
	Electric forklift (loading/unloading outside on loading dock)	82	86
Internal Warehouse Operations Noise	Electric forklift (loading/unloading inside warehouse)		
	Auto Pallet Wrapper[4]	80	90
	Auto Pallet Inverter[1]	75	85
	Pallet Wrapper Compressor	86	90
	Conveyor & Sortation System[3,5]	85	87
Workshop Noise	Angle Grinder[2]	93	104
	Welding Converter	90	94
	Table Saw	83	86
	Rattle Gun	86	104

[1] Noise source obtained from Payne Pallet Inverters. Noise level quoted assumed to be Leq SPL @ 1m (https://paynepalletinverters.co.uk/app/uploads/2022/12/Si-Manual.pdf).

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

[3] Includes 5 dB(A) adjustment to account for tonality characteristics.

[4] Noise source obtained from Fromm Packaging Australia FSW360 Pallet Wrapping Machine. Noise level assumed to be L_{eq} SPL @ 1m (https://www.fromm-pack.com.au/media/j0vbujyx/operation-manual.pdf).

[5] Noise source obtained from University of Arkansas Paper: 'Noise Control in Sorting Conveyors'. Noise level assumed to be L_{eq} SPL @ 1m (Noise Control in Sorting Conveyors (uark.edu))

6.2.3 Modelling Assumptions

For noise associated with light and heavy vehicles, vehicle generation data for the site has been based on the traffic generation data sent to Vipac by Charter Hall and reproduced in Table 6-2. The location of inbound and outbound heavy vehicle traffic is based on the Tenant Fit-out Plan.

Table 6-2: Site Vehicle Generation

Vehicle Type	Location	Movements per day
Inbound Heavy Vehicles	Eastern and Southern Façade	24
Outbound Heavy Vehicles	Northern Facade	26
Light Vehicles (Staff & Visitors)	Carpark	150

The following information has been used in the modelling regarding noise sources associated with vehicle movements:

- 24 hour site operation.
- Heavy vehicle and passenger vehicle pass bys have been modelled as line noise sources at 2m and 0.5m above ground respectively. Their locations are detailed in Figure 6-2.
- All vehicle movements were assumed to travel at 10km/h.
- Truck reversing beepers have been modelled as point sources at 2m above ground with a duration of 20 seconds per heavy vehicle movement.
- Light passenger vehicle daily movements have been split 60%/10%/30% for day, evening, and night periods respectively on the assumption the majority of movements will be driven by staff arriving and leaving in the day and night (i.e. before 7am) periods.
- Considering the scale of the proposed development it is expected that night time operation after 10pm will be less than the day and evening periods. Notwithstanding, heavy vehicle movements during the night periods have been based on the traffic data in Table 6-2 for the purposes of a conservative assessment.
- Inbound heavy vehicle loading/unloading activities (external forklifts and HV reverse beeps) have been split 25%/75% between the eastern and southern façade.
- Forklift operations are primarily expected to occur internally, but also occasionally externally as the loading and unloading of vehicles is conducted. External Forklift usage associated with loading/unloading product, as a worst case, is assumed to occur for each heavy vehicle movement.
    - Assuming loading/unloading takes approximately 5 minutes for each truck, the external forklift noise source is assumed to occur for approximately:
        - 8% of the time on the southern and eastern façade, where 1 truck is expected per hour.
        - 9% of the time on the northern façade, where 1.08 trucks are expected per hour.
    - External forklifts are modelled as point sources located 1m above ground level.
    - The forklift is assumed to manoeuvre in and out of the warehouse while doing so.
    - The model accounts for an approximately 50/50 inside/outside split of time for the forklift unloading/loading a vehicle.
- Heavy vehicle movements are inclusive of waste collection and sweep cleaning trucks.

Figure 6-2 presents the layout of all noise sources associated with light and heavy vehicles listed above. Noise from HV Reverse Beepers and External Forklift Operations have been split into 3 equal point sources for the Northern Façade and 4 equal point sources for the South and Eastern Facades to account for the noise coming from different parts of the façade.

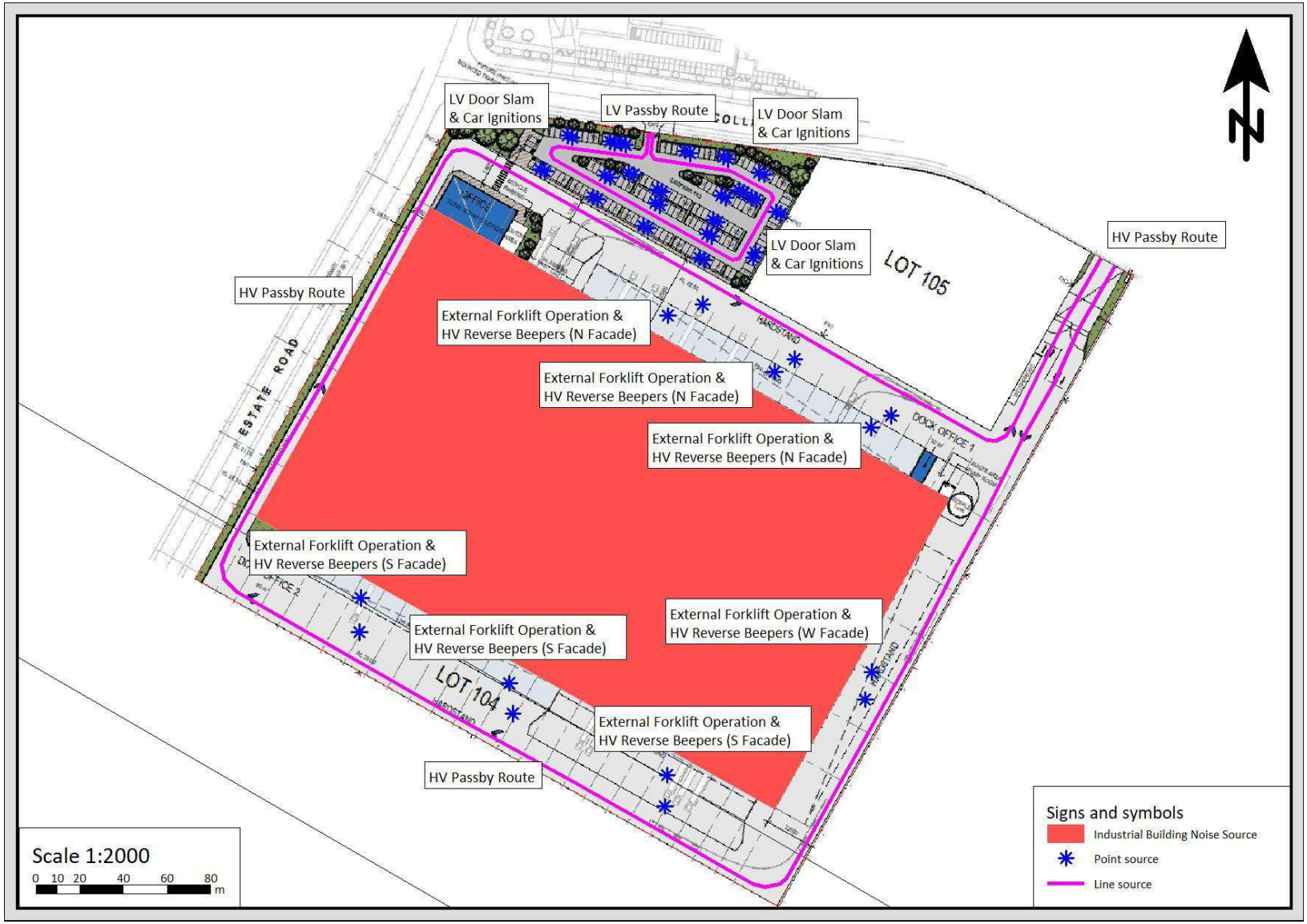


Figure 6-2: Layout of Noise Sources

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

- Charter Hall have advised a maximum of 60 electric units of mobile handling equipment (MHE) are expected to be used within the warehouse.
    - All types of MHE, including electric forklifts, reach trucks and pallet riders, are modelled with the SPL of an electric forklift as per Table 6-1.
    - MHE noise sources have been modelled as point sources 1m above ground, dispersed evenly throughout the warehouse as shown in Figure 6-3.
    - Internal MHE have been assumed to be operating 100% of the time.
- Charter Hall have advised a maximum of 6 auto pallet wrappers (including associated compressor and pallet inverters) are expected to be used within the warehouse. Pallet wrapper noise sources have been modelled as point sources 1.0m above ground distributed evenly around the warehouse shown by Figure 6-3, operating 100% of the time.
- Workshop noise sources (angle grinder, table saw, rattle gun and welding converter) were included to cover typical noise emissions servicing and maintaining equipment used onsite.
    - All workshop equipment was modelled as point sources located 0.5m above the ground.
    - Equipment is conservatively assumed to be operating 20% of the time.
- Noise from the Sorting & Conveyor system was modelled as a line source 1m above the ground inside the warehouse, operating 100% of the time in the location shown in Figure 6-3.
- Figure 6-3 presents the layout of noise sources located inside the warehouse. Note the internal warehouse noise is a sum of all noise sources inside the entire area contributing to one diffusive noise environment.

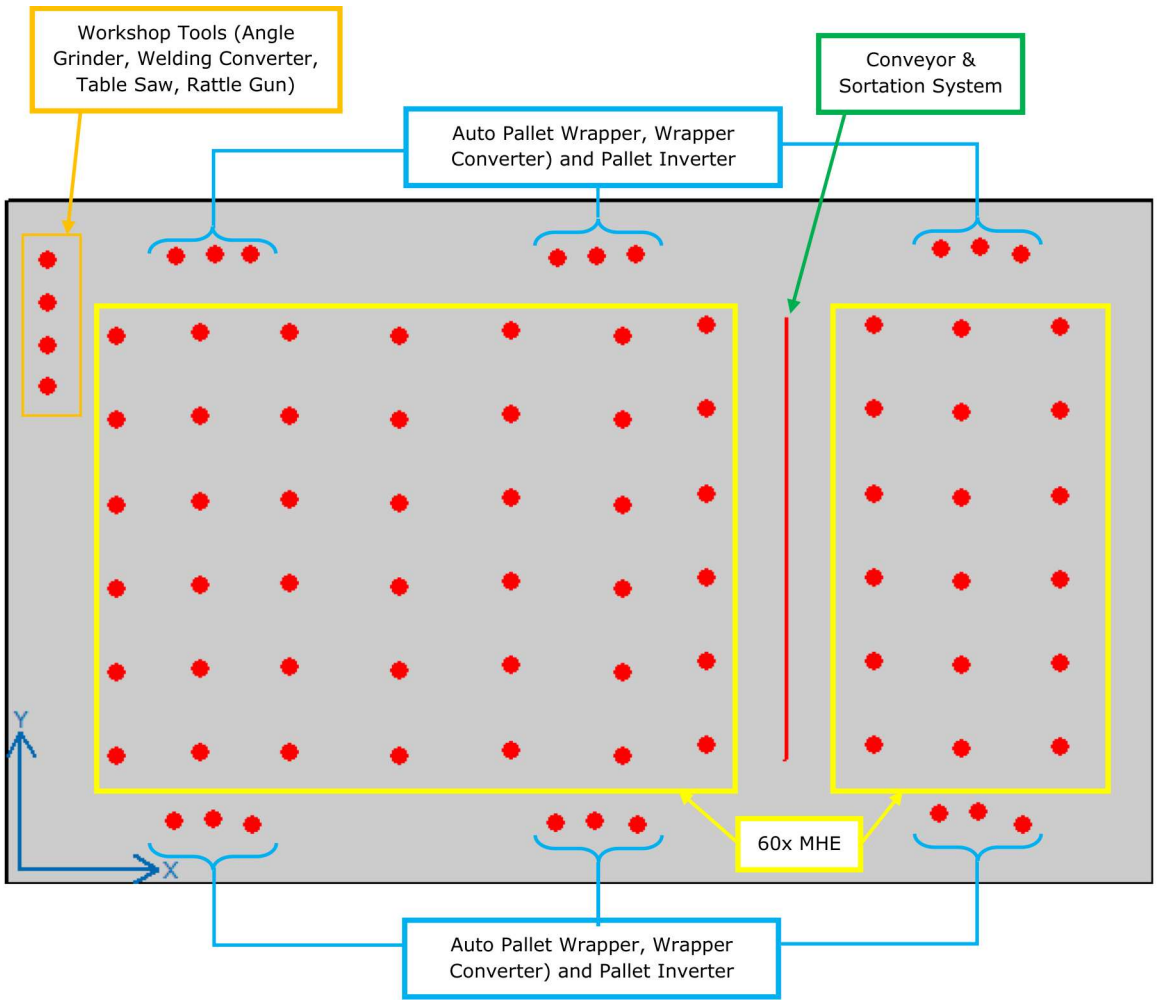


Figure 6-3: Layout of Internal Noise Sources

The warehouse building has been modelled with the following assumptions:

- 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 (as shown in Appendix C).
- Floor: Concrete slab.
- Building height is modelled to be approximately 10m as per elevation drawings.
- Mechanical plant is anticipated to operate 24/7.
- Roller doors have been modelled as open and have the following properties:
    - Roller doors for the recessed loading dock area dimensions are approximately 3m wide and 4m high in accordance with the elevation drawings.
    - On-grade shutters are 5m wide and 5.5m high as per the elevation drawings.
    - The workshop roller door on the western (external) façade is assumed to be closed the majority of the time.

Table 6-3 summarises the number of movements/activity assumptions used for the noise impact assessment.

Table 6-3 - EDQ/LCC Movement/Activity Assumptions

Noise Source	Assumed Events
Light Vehicle Door Close (day/evening/night)	16/7.5/10 seconds per hour
Light Vehicle Ignition (day/evening/night)	
Light Vehicle Passby[1] (day/evening/night)	42%/19%/26% per hour
Heavy Vehicle Passby[1]	25% per hour
Heavy Vehicle Reverse Beeping (northern/western/southern façade)	22/5/15 seconds per hour
External Forklift (northern/western/southern façade)	325/75/225 seconds per hour
Internal MHE (Forklifts)	60 units, 100% per hour
Conveyor and Sortation System	100% per hour
Auto Pallet Wrapper (and compressor), Pallet Inverter	6 units of each, 100% per hour
Workshop Equipment (Angle Grinder, Table Saw, Welding Converter, Rattle Gun)	20% per hour

[1] A light vehicle passby is a car entering or exiting the carpark, a heavy vehicle passby is a truck entering and exiting the warehouse area.

It is noted the above assumptions of events per period/percentage of time is considered conservative, and in reality, is likely to be less frequent. This provides for a worst case assessment.

7 Results

7.1 Predicted Noise Levels at the NSRs

Worst case predicted cumulative noise emissions from the project have been compared against the LCC noise criteria outlined in Section 5. The assessment has calculated cumulative 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. A noise source contribution sample at the most exposed NSR has also been included in Appendix B.

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

NSR	Predicted Noise Levels, L_{Aeq}			
	Day	Evening	Night	
Criteria	47dB(A)	46dB(A)	40dB(A)	60dB(A) L_{AMax}
1-23 Stanley Court	33	33	33	41
2-10 Stanley Court	34	34	34	42
51-59 Crowson Lane	36	36	36	45
61-69 Crowson Lane	37	37	37	46
71-79 Crowson Lane	37	37	37	47
81-89 Crowson Lane	38	38	38	48
91-99 Crowson Lane	38	38	38	49
101-109 Crowson Lane	39	39	39	46
113-127 Crowson Lane	38	38	38	42
129-139 Crowson Lane	37	37	37	43
141-147 Rosina Road	34	34	34	39
142-148 Rosina Road	36	36	36	38
142-152 Crowson Lane	37	37	37	33
4524-4534 Mount Lindesay Highway	32	32	32	39
4536-4542 Mound Lindesay Highway	32	32	32	36
4544-4554 Mount Lindesay Highway	32	32	32	37
4556-4564 Mount Lindesay Highway	33	33	33	37
4566-4574 Mount Lindesay Highway	33	33	33	38
4576-4584 Mount Lindesay Highway	33	33	33	38
4586-4600 Mount Lindesay Highway	33	33	33	38
4602-4622 Mound Lindesay Highway	33	33	33	38

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

7.2 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.

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) and assessment to the nearest site boundary, the allowable mechanical noise levels without mitigation are presented in Table 7-2.

Table 7-2 - 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	95

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.

8 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.

8.1 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.

8.2 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.

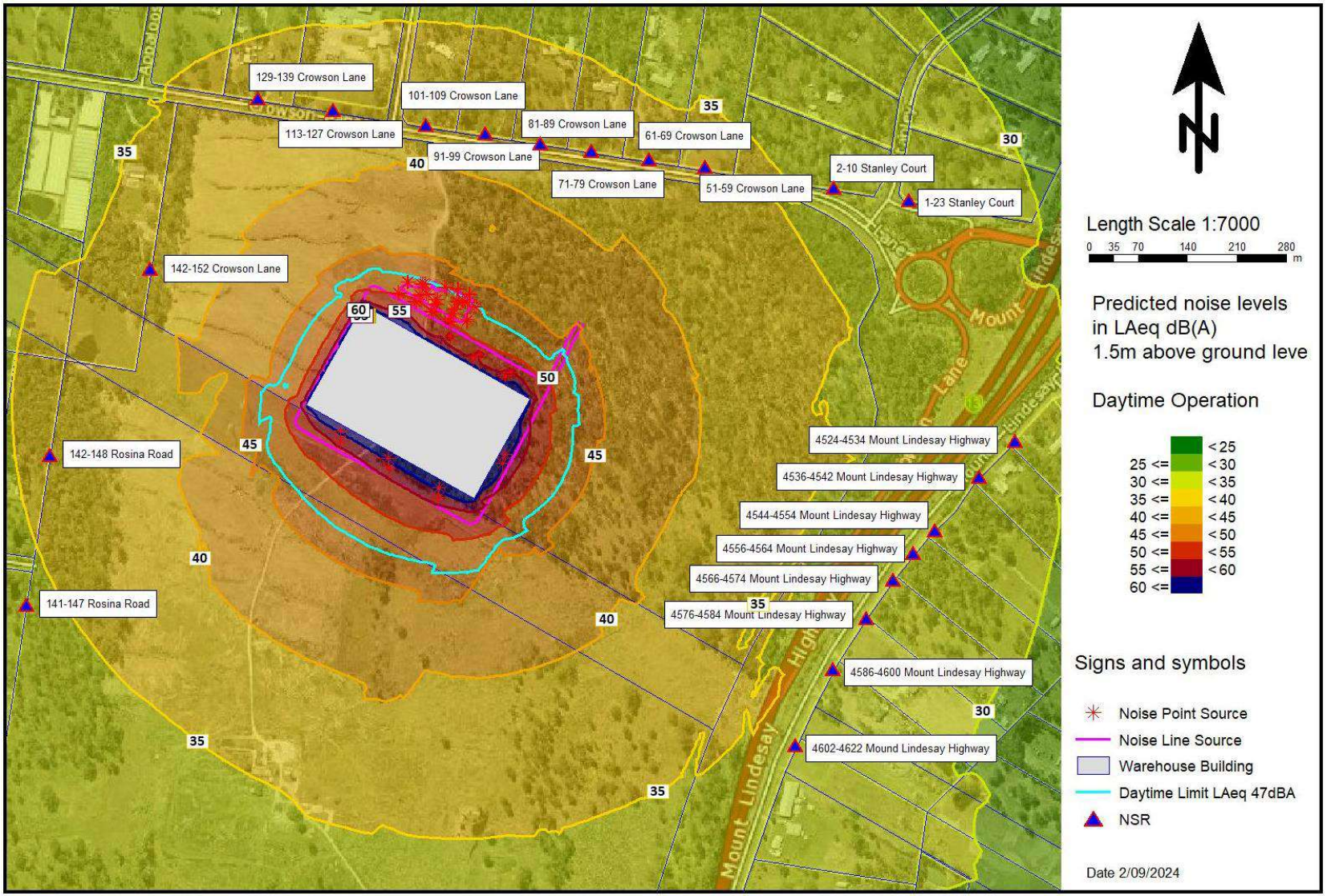
A mechanical plant noise assessment should be conducted by a suitably qualified acoustic consultant once plant selections are finalised.

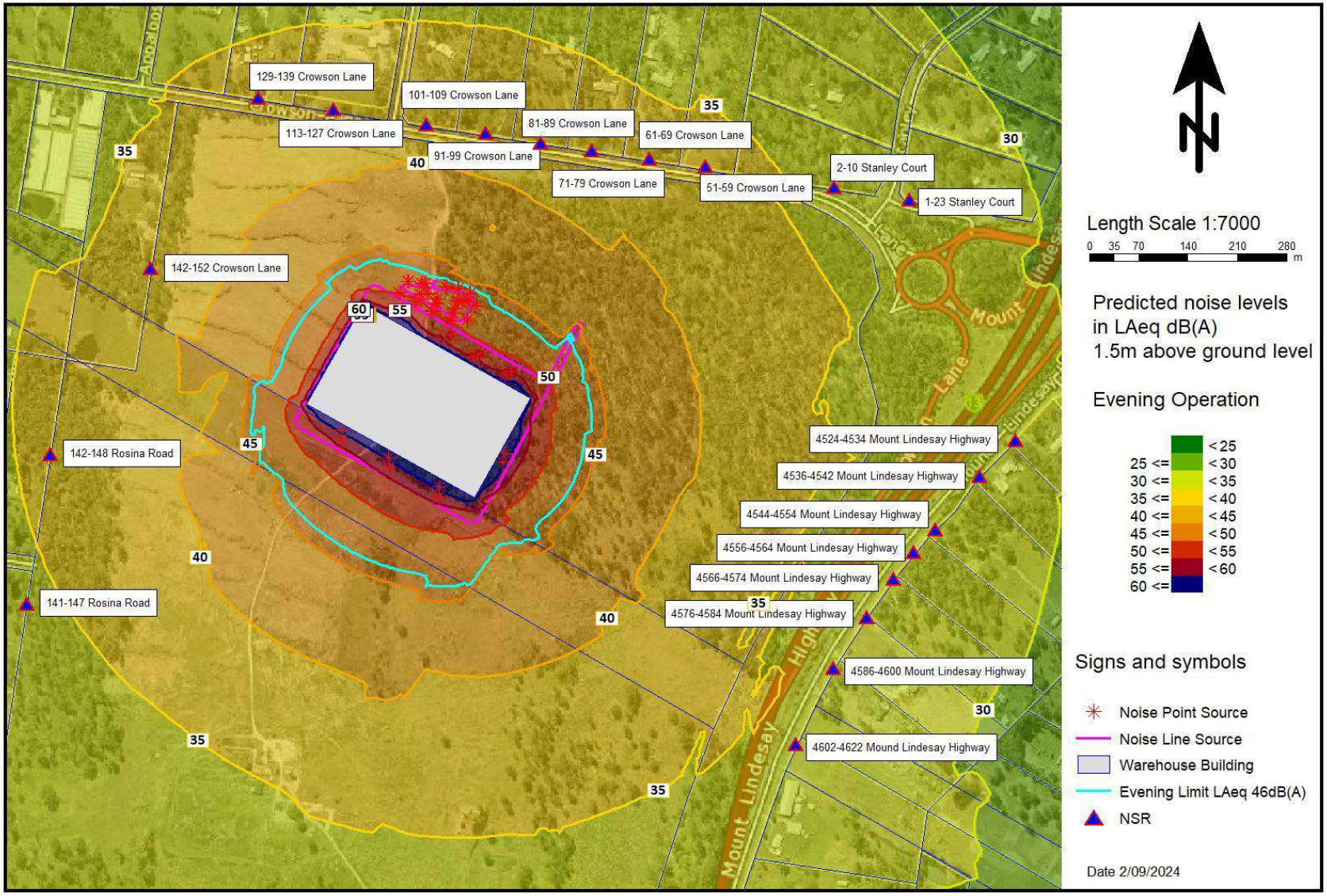
9 Conclusion

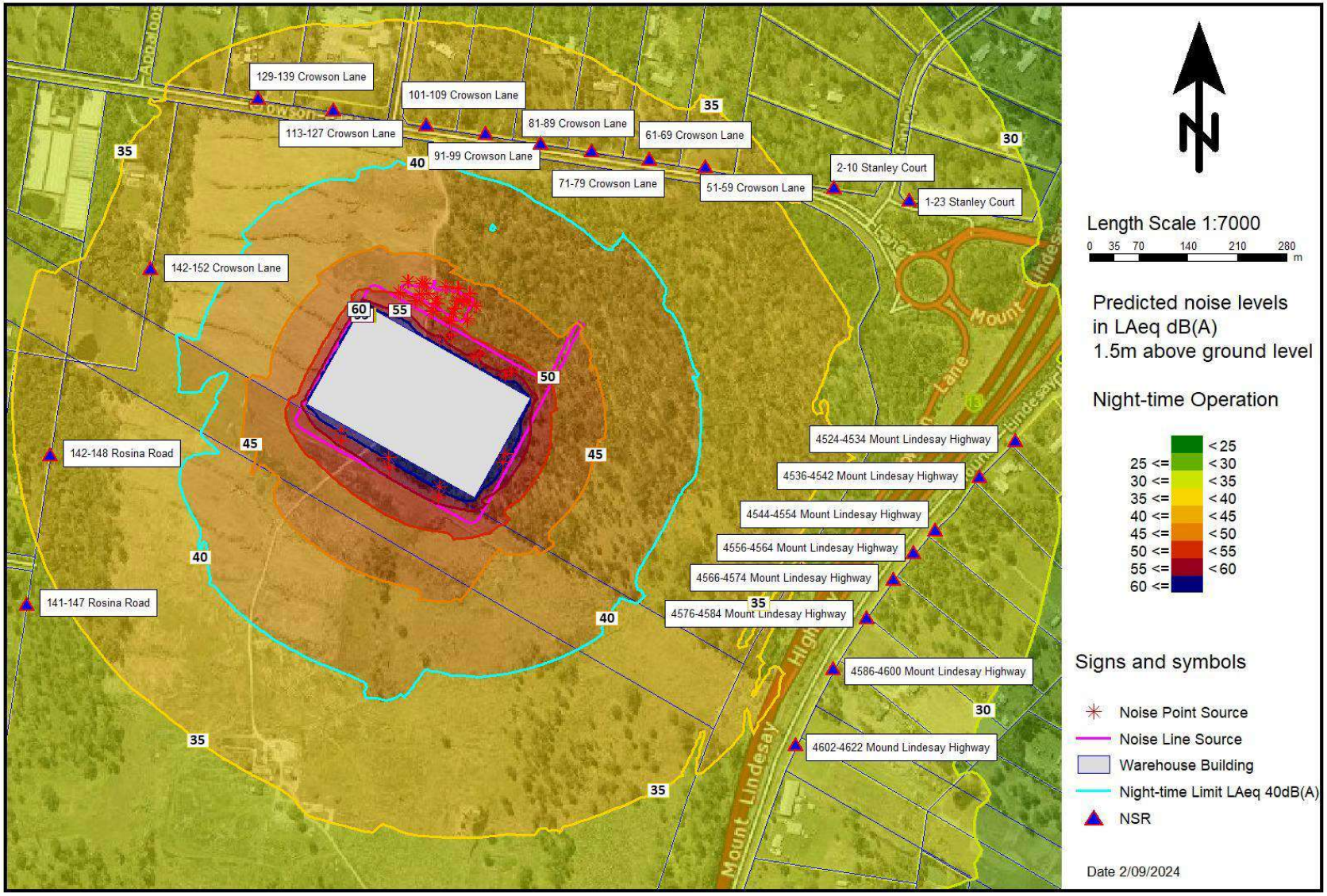
Vipac has conducted a noise impact assessment for the proposed development Lot 104 of the Flagstone Industrial Estate in North Maclean. Potential noise emissions from the development were predicted to the nearest sensitive receptor locations and compared against the noise criteria as per Section 5.

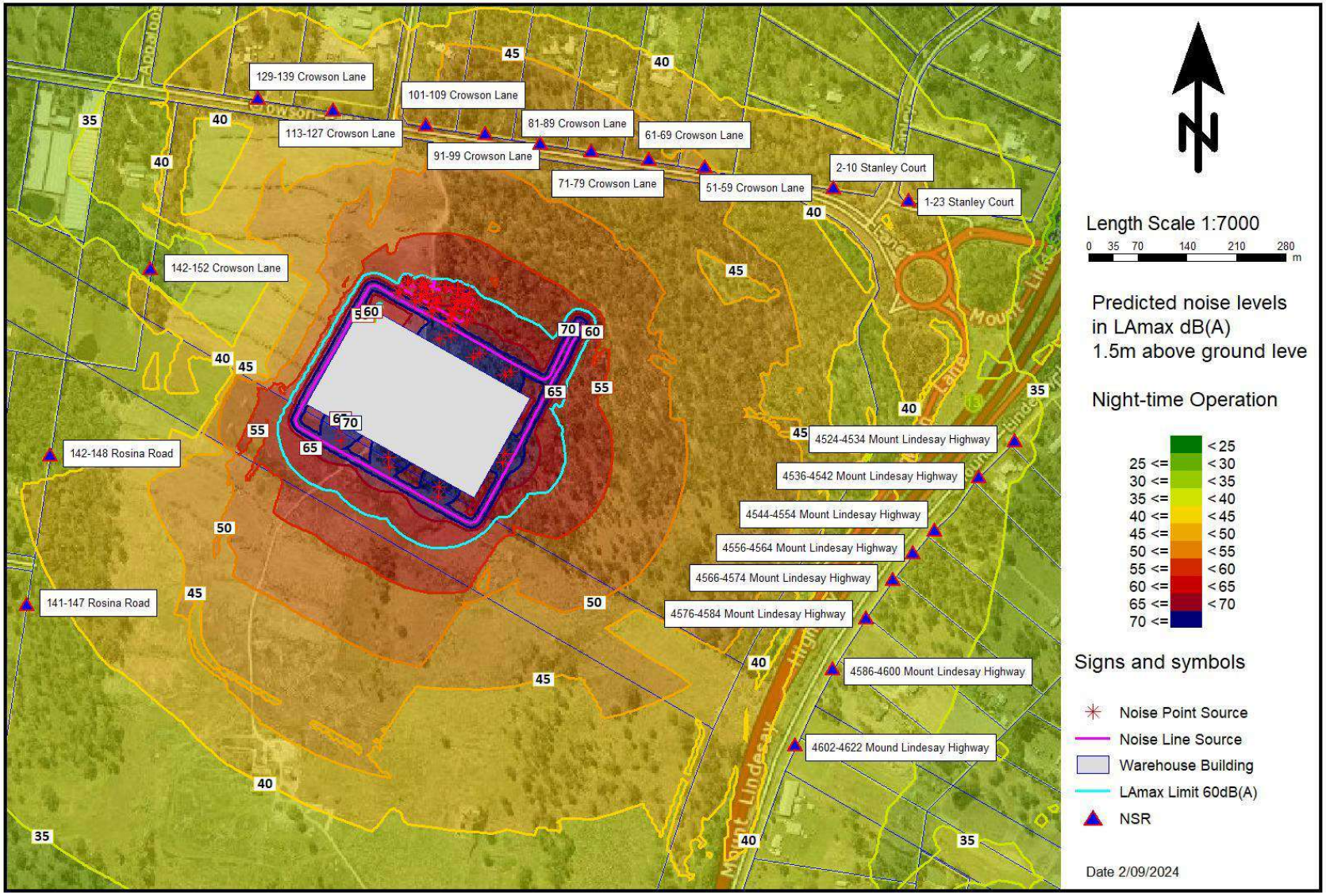
Noise levels are predicted to comply with the noise criteria with the implementation of the recommendations outlined in this report.

Appendix A Noise Contour Maps




129-139 Crowson Lane
101-109 Crowson Lane
113-127 Crowson Lane
81-89 Crowson Lane
61-69 Crowson Lane
91-99 Crowson Lane
71-79 Crowson Lane
51-59 Crowson Lane
2-10 Stanley Court
1-23 Stanley Court
142-152 Crowson Lane
142-148 Rosina Road
141-147 Rosina Road
4524-4534 Mount Lindesay Highway
4536-4542 Mount Lindesay Highway
4544-4554 Mount Lindesay Highway
4556-4564 Mount Lindesay Highway
4566-4574 Mount Lindesay Highway
4576-4584 Mount Lindesay Highway
4586-4600 Mount Lindesay Highway
4602-4622 Mound Lindesay Highway
Mount Lindesay Highway
Length Scale 1:7000
0 35 70 140 210 280 m
Predicted noise levels
in LAeq dB(A)
1.5m above ground level
Evening Operation
< 25
25 <= < 30
30 <= < 35
35 <= < 40
40 <= < 45
45 <= < 50
50 <= < 55
55 <= < 60
60 <=
Signs and symbols
Noise Point Source
Noise Line Source
Warehouse Building
Evening Limit LAeq 46dB(A)
NSR
Date 2/09/2024


129-139 Crowson Lane
101-109 Crowson Lane
113-127 Crowson Lane
81-89 Crowson Lane
61-69 Crowson Lane
91-99 Crowson Lane
71-79 Crowson Lane
51-59 Crowson Lane
2-10 Stanley Court
1-23 Stanley Court
142-152 Crowson Lane
142-148 Rosina Road
141-147 Rosina Road
4524-4534 Mount Lindesay Highway
4536-4542 Mount Lindesay Highway
4544-4554 Mount Lindesay Highway
4556-4564 Mount Lindesay Highway
4566-4574 Mount Lindesay Highway
4576-4584 Mount Lindesay Highway
4586-4600 Mount Lindesay Highway
4602-4622 Mound Lindesay Highway
Mount Lindesay Highway
Length Scale 1:7000
0 35 70 140 210 280 m
Predicted noise levels
in LAeq dB(A)
1.5m above ground level
Night-time Operation
< 25
25 <= < 30
30 <= < 35
35 <= < 40
40 <= < 45
45 <= < 50
50 <= < 55
55 <= < 60
60 <=
Signs and symbols
Noise Point Source
Noise Line Source
Warehouse Building
Night-time Limit LAeq 40dB(A)
NSR
Date 2/09/2024


129-139 Crowson Lane
101-109 Crowson Lane
113-127 Crowson Lane
81-89 Crowson Lane
91-99 Crowson Lane
61-69 Crowson Lane
71-79 Crowson Lane
51-59 Crowson Lane
2-10 Stanley Court
1-23 Stanley Court
142-152 Crowson Lane
142-148 Rosina Road
141-147 Rosina Road
4524-4534 Mount Lindesay Highway
4536-4542 Mount Lindesay Highway
4544-4554 Mount Lindesay Highway
4556-4564 Mount Lindesay Highway
4566-4574 Mount Lindesay Highway
4576-4584 Mount Lindesay Highway
4586-4600 Mount Lindesay Highway
4602-4622 Mound Lindesay Highway
Length Scale 1:7000
0 35 70 140 210 280 m
Predicted noise levels
in LAmax dB(A)
1.5m above ground leve
Night-time Operation
< 25
25 <= < 30
30 <= < 35
35 <= < 40
40 <= < 45
45 <= < 50
50 <= < 55
55 <= < 60
60 <= < 65
65 <= < 70
70 <=
Signs and symbols
Noise Point Source
Noise Line Source
Warehouse Building
LAmax Limit 60dB(A)
NSR
Date 2/09/2024

Appendix B Source Contributions at 101-109 Crowson Lane

Lot 102 Flagstone Estate, North Maclean
Contribution level - Lot104 LCC Single Points **9**

Source	Source ty	Ld dB(A)	Le dB(A)	Ln dB(A)	Lmax dB(A)
Receiver 101-109 Crowson Lane Ld 38.6 dB(A) Le 38.6 dB(A) Ln 38.6 dB(A) Lmax 46.1 dB(A)					
Lot 104 Warehouse - Roof	Area	37.1	37.1	37.1	
Lot 104 Warehouse - Northern Facade	Area	30.3	30.3	30.3	
Lot 104 Warehouse - Western Facade	Area	25.1	25.1	25.1	
Lot 104 Warehouse - On-Grade Door	Area	23.1	23.1	23.1	
Lot 104 Warehouse - Recessed Door	Area	20.2	20.2	20.2	
Lot 104 Warehouse - Recessed Door	Area	19.9	19.9	19.9	
Lot 104 Warehouse - Recessed Door	Area	19.4	19.4	19.4	
Lot 104 Warehouse - Recessed Door	Area	18.6	18.6	18.6	
Lot 104 Warehouse - Southern Facade	Area	12.4	12.4	12.4	
Heavy Vehicle Reverse Beep	Point	12.1	12.1	12.1	46.1
Lot 104 Warehouse - Eastern Facade	Area	11.3	11.3	11.3	
Heavy Vehicle Reverse Beep	Point	11.1	11.1	11.1	45.0
Heavy Vehicle Reverse Beep	Point	10.0	10.0	10.0	44.0
Lot 104 Warehouse - On-Grade Door	Area	8.4	8.4	8.4	
Lot 104 Warehouse - On-Grade Door	Area	8.3	8.3	8.3	
Lot 104 Warehouse - On-Grade Door	Area	8.3	8.3	8.3	
External Forklifts	Point	8.2	8.2	8.2	27.5
Lot 104 Warehouse - On-Grade Door	Area	8.2	8.2	8.2	
Lot 104 Warehouse - On-Grade Door	Area	8.0	8.0	8.0	
Lot 104 Warehouse - On-Grade Door	Area	7.8	7.8	7.8	
Lot 104 Warehouse - On-Grade Door	Area	7.8	7.8	7.8	
Lot 104 Warehouse - On-Grade Door	Area	7.8	7.8	7.8	
Lot 104 Warehouse - On-Grade Door	Area	7.7	7.7	7.7	
Lot 104 Warehouse - On-Grade Door	Area	7.3	7.3	7.3	
Lot 104 Warehouse - On-Grade Door	Area	7.3	7.3	7.3	
Lot 104 Warehouse - On-Grade Door	Area	7.3	7.3	7.3	
Lot 104 Warehouse - On-Grade Door	Area	7.0	7.0	7.0	
Lot 104 Warehouse - On-Grade Door	Area	7.0	7.0	7.0	
External Forklifts	Point	5.8	5.8	5.8	25.0
Heavy Vehicle Passby	Line	5.2	5.2	5.2	36.1
External Forklifts	Point	3.9	3.9	3.9	23.2
Lot 104 Warehouse - On-Grade Door	Area	0.5	0.5	0.5	
Lot 104 Warehouse - On-Grade Door	Area	0.2	0.2	0.2	
Lot 104 Warehouse - On-Grade Door	Area	-0.3	-0.3	-0.3	
Lot 104 Warehouse - On-Grade Door	Area	-0.7	-0.7	-0.7	
Lot 104 Warehouse - On-Grade Door	Area	-0.8	-0.8	-0.8	
Lot 104 Warehouse - On-Grade Door	Area	-0.9	-0.9	-0.9	
Lot 104 Warehouse - On-Grade Door	Area	-0.9	-0.9	-0.9	
Lot 104 Warehouse - On-Grade Door	Area	-1.0	-1.0	-1.0	
Lot 104 Warehouse - On-Grade Door	Area	-1.0	-1.0	-1.0	
Lot 104 Warehouse - On-Grade Door	Area	-1.1	-1.1	-1.1	
Lot 104 Warehouse - On-Grade Door	Area	-1.1	-1.1	-1.1	
Lot 104 Warehouse - On-Grade Door	Area	-1.2	-1.2	-1.2	
Lot 104 Warehouse - On-Grade Door	Area	-1.2	-1.2	-1.2	

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SoundPLAN 8.2

Lot 102 Flagstone Estate, North Maclean
Contribution level - Lot104 LCC Single Points

9

Source	Source ty	Ld dB(A)	Le dB(A)	Ln dB(A)	Lmax dB(A)
Lot 104 Warehouse - On-Grade Door	Area	-1.3	-1.3	-1.3	
Lot 104 Warehouse - On-Grade Door	Area	-1.3	-1.3	-1.3	
Lot 104 Warehouse - On-Grade Door	Area	-1.4	-1.4	-1.4	
Lot 104 Warehouse - On-Grade Door	Area	-1.6	-1.6	-1.6	
Lot 104 Warehouse - On-Grade Door	Area	-1.7	-1.7	-1.7	
Lot 104 Warehouse - On-Grade Door	Area	-1.8	-1.8	-1.8	
Lot 104 Warehouse - On-Grade Door	Area	-1.9	-1.9	-1.9	
Lot 104 Warehouse - Recessed Door	Area	-4.0	-4.0	-4.0	
Lot 104 Warehouse - Recessed Door	Area	-4.1	-4.1	-4.1	
Lot 104 Warehouse - Recessed Door	Area	-4.1	-4.1	-4.1	
Lot 104 Warehouse - Recessed Door	Area	-4.3	-4.3	-4.3	
Lot 104 Warehouse - Recessed Door	Area	-4.6	-4.6	-4.6	
Lot 104 Warehouse - Recessed Door	Area	-4.7	-4.7	-4.7	
Lot 104 Warehouse - Recessed Door	Area	-4.8	-4.8	-4.8	
Lot 104 Warehouse - Recessed Door	Area	-4.8	-4.8	-4.8	
Lot 104 Warehouse - Recessed Door	Area	-4.9	-4.9	-4.9	
Lot 104 Warehouse - Recessed Door	Area	-5.0	-5.0	-5.0	
Lot 104 Warehouse - Recessed Door	Area	-5.1	-5.1	-5.1	
Lot 104 Warehouse - Recessed Door	Area	-5.2	-5.2	-5.2	
Lot 104 Warehouse - Recessed Door	Area	-5.5	-5.5	-5.5	
Lot 104 Warehouse - Recessed Door	Area	-5.5	-5.5	-5.5	
Lot 104 Warehouse - Recessed Door	Area	-5.7	-5.7	-5.7	
Lot 104 Warehouse - Recessed Door	Area	-6.1	-6.1	-6.1	
Lot 104 Warehouse - Recessed Door	Area	-6.1	-6.1	-6.1	
Lot 104 Warehouse - Recessed Door	Area	-6.3	-6.3	-6.3	
LV Car Door Slam	Point	-13.1	-16.6	-15.2	29.5
LV Passby	Line	-13.4	-16.8	-15.5	12.3
LV Car Door Slam	Point	-13.5	-16.8	-15.5	29.6
LV Car Door Slam	Point	-13.5	-16.9	-15.6	29.1
LV Car Door Slam	Point	-13.7	-17.0	-15.8	29.4
LV Car Door Slam	Point	-13.7	-17.1	-15.8	29.4
LV Car Door Slam	Point	-14.0	-17.4	-16.2	28.1
LV Car Door Slam	Point	-14.2	-17.5	-16.3	28.9
LV Car Door Slam	Point	-14.2	-17.6	-16.3	28.4
LV Car Door Slam	Point	-14.2	-17.6	-16.3	28.4
LV Car Door Slam	Point	-14.3	-17.7	-16.4	28.8
LV Car Door Slam	Point	-14.4	-17.8	-16.5	28.3
LV Car Door Slam	Point	-14.4	-17.7	-16.5	28.7
LV Car Door Slam	Point	-14.5	-17.9	-16.6	28.1
LV Car Door Slam	Point	-14.9	-18.3	-17.0	27.7
LV Car Door Slam	Point	-14.9	-18.3	-17.0	28.2
LV Car Door Slam	Point	-14.9	-18.3	-17.0	27.7
LV Car Door Slam	Point	-15.1	-18.5	-17.2	28.0
LV Car Door Slam	Point	-15.1	-18.6	-17.2	27.5
LV Car Door Slam	Point	-15.5	-19.0	-17.6	27.1

Lot 102 Flagstone Estate, North Maclean
Contribution level - Lot104 LCC Single Points

9

Source	Source ty	Ld dB(A)	Le dB(A)	Ln dB(A)	Lmax dB(A)
LV Car Door Slam	Point	-15.6	-19.0	-17.7	27.0
LV Car Door Slam	Point	-16.6	-19.9	-18.7	27.6
External Forklifts	Point	-17.0	-17.0	-17.0	4.0
LV Ignition	Point	-17.2	-20.6	-19.3	21.4
Heavy Vehicle Reverse Beep	Point	-17.5	-17.5	-17.5	18.1
LV Ignition	Point	-17.6	-21.0	-19.7	21.0
External Forklifts	Point	-17.6	-17.6	-17.6	3.4
External Forklifts	Point	-17.8	-17.8	-17.8	3.2
Heavy Vehicle Reverse Beep	Point	-17.9	-17.9	-17.9	17.7
LV Ignition	Point	-18.1	-21.4	-20.2	21.0
LV Ignition	Point	-18.2	-21.5	-20.3	20.0
Heavy Vehicle Reverse Beep	Point	-18.3	-18.3	-18.3	17.3
LV Ignition	Point	-18.3	-21.7	-20.4	20.3
LV Ignition	Point	-18.3	-21.7	-20.4	20.3
LV Ignition	Point	-18.4	-21.9	-20.5	20.2
LV Ignition	Point	-18.5	-21.8	-20.5	20.6
LV Ignition	Point	-18.6	-22.0	-20.7	20.0
External Forklifts	Point	-18.8	-18.8	-18.8	2.2
LV Ignition	Point	-19.0	-22.4	-21.1	19.6
LV Ignition	Point	-19.0	-22.5	-21.1	19.6
Heavy Vehicle Reverse Beep	Point	-19.2	-19.2	-19.2	16.4
LV Ignition	Point	-19.3	-22.7	-21.4	19.3
LV Ignition	Point	-19.7	-23.1	-21.8	18.9
LV Ignition	Point	-19.8	-23.2	-21.9	18.8
LV Ignition	Point	-20.7	-24.0	-22.8	19.5
LV Ignition	Point	-22.5	-25.8	-24.7	21.3
LV Ignition	Point	-22.5	-25.8	-24.7	21.3
LV Ignition	Point	-23.0	-26.3	-25.2	20.8
LV Ignition	Point	-23.1	-26.4	-25.3	20.7
LV Ignition	Point	-23.7	-27.0	-26.0	20.1
LV Ignition	Point	-23.9	-27.2	-26.2	19.9

Appendix C 0.4BMT Sheet Metal R_W Prediction

Sound Insulation Prediction (v9.0.23)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within Rw ±3 dB
- Key No. 1709
Job Name:
Job No.: Initials:michaelb
Date:30/08/2024
File Name:

Notes:

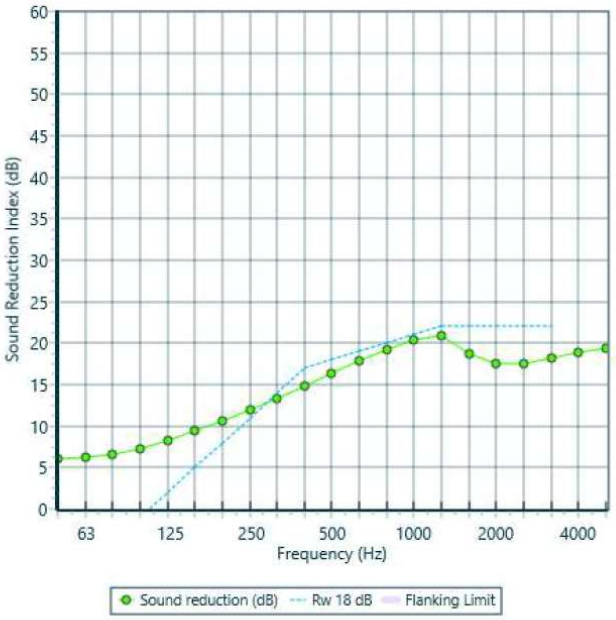
Rw 18 dB
C 0 dB
Ctr -2 dB

Panel Size = 2.7 m x 4.0 m
Partition surface mass = 3.12 kg/m²

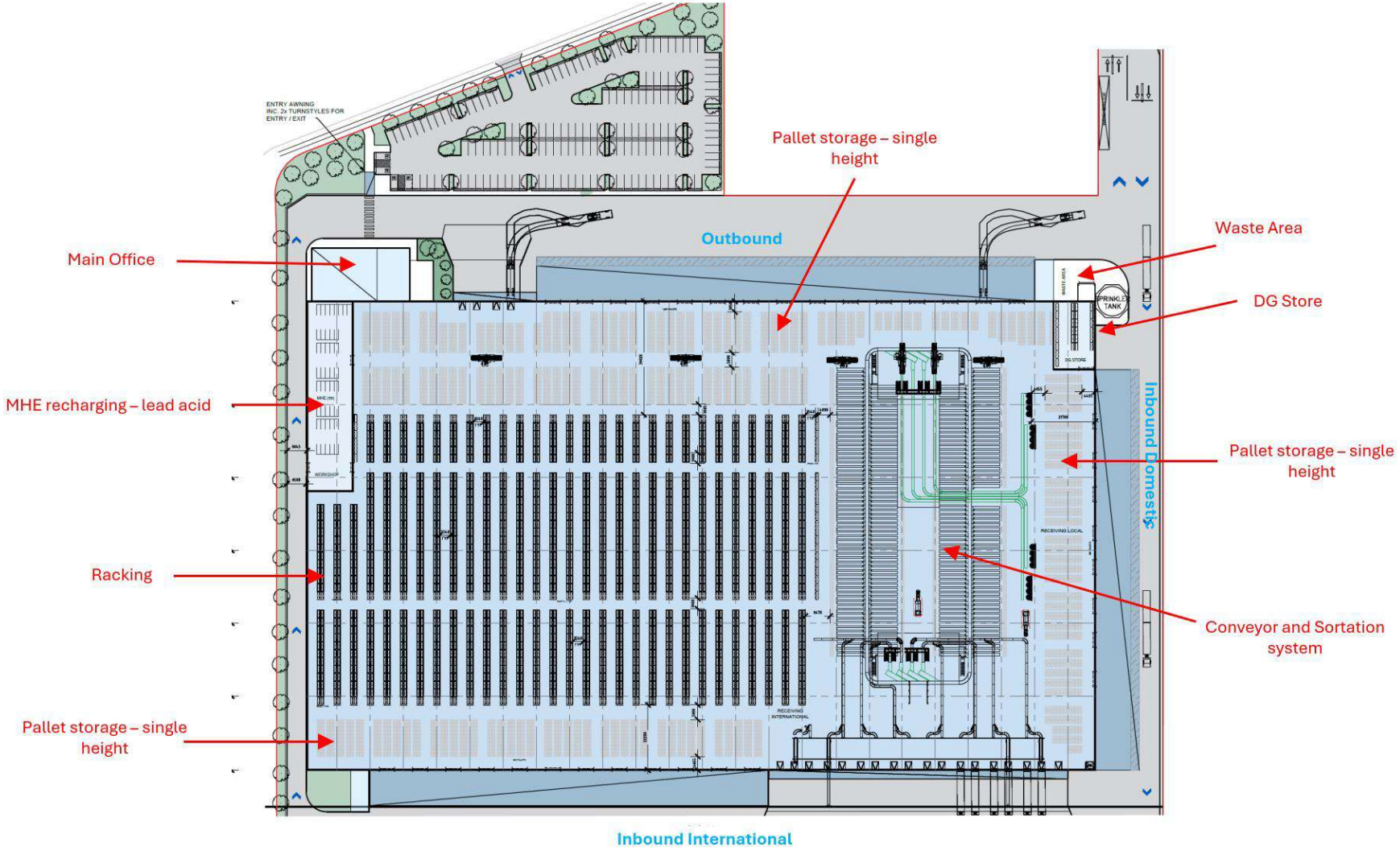
System description

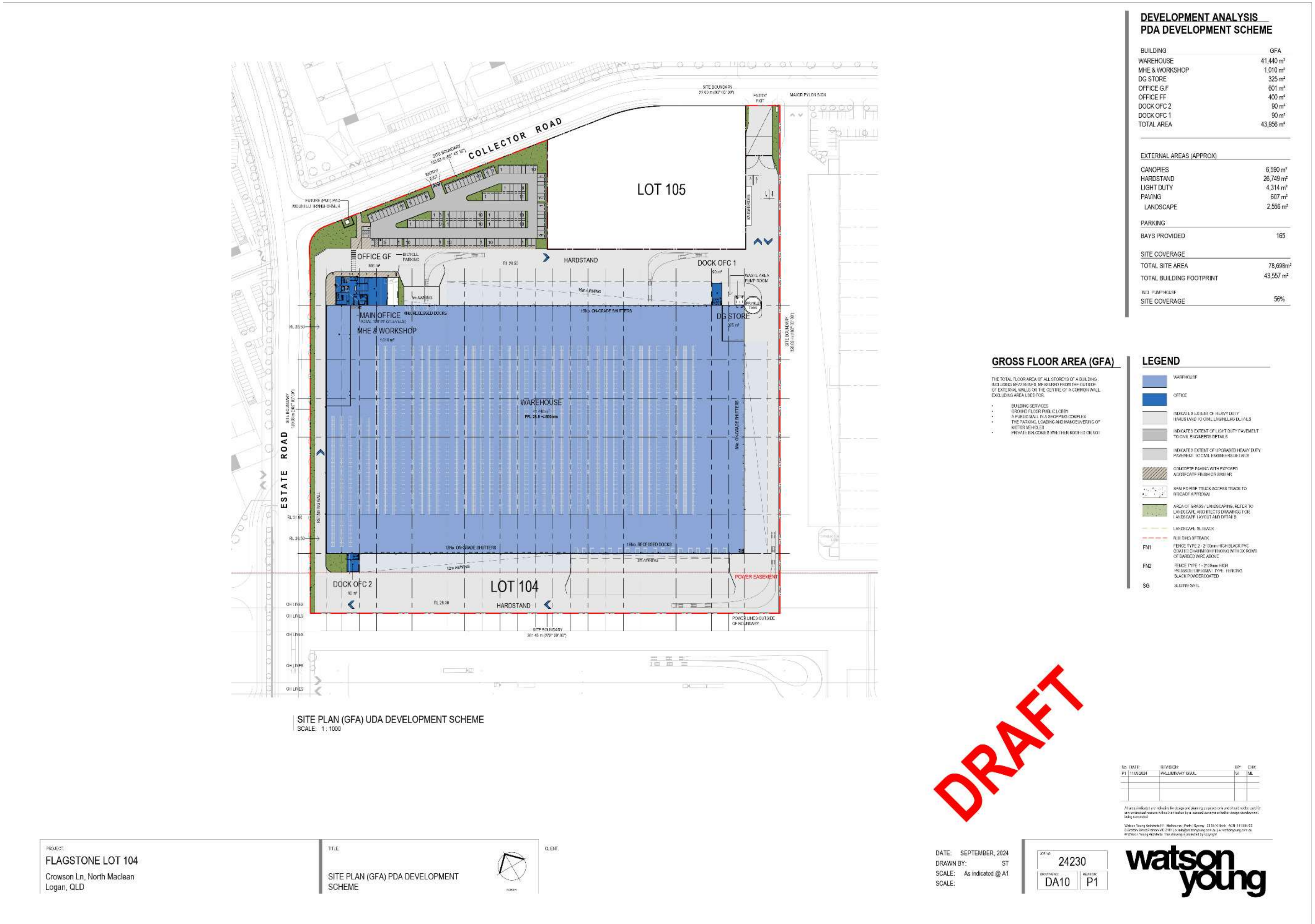
Panel 1 : 1 x 0.4 mm Custom Orb (0.55mm)

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




DEVELOPMENT ANALYSIS
PDA DEVELOPMENT SCHEME
BUILDING GFA
WAREHOUSE 41,440 m²
MHE & WORKSHOP 1,010 m²
DG STORE 325 m²
OFFICE G.F 601 m²
OFFICE FF 400 m²
DOCK OFC 2 90 m²
DOCK OFC 1 90 m²
TOTAL AREA 43,956 m²
EXTERNAL AREAS (APPROX)
CANOPIES 6,590 m²
HARDSTAND 26,749 m²
LIGHT DUTY 4,314 m²
PAVING 607 m²
LANDSCAPE 2,556 m²
PARKING
BAYS PROVIDED 165
SITE COVERAGE
TOTAL SITE AREA 78,698m²
TOTAL BUILDING FOOTPRINT 43,557 m²
SITE COVERAGE 56%
GROSS FLOOR AREA (GFA)
LEGEND
COLLECTOR ROAD
ESTATE ROAD
LOT 105
LOT 104
OFFICE GF
MAIN OFFICE
MHE & WORKSHOP
WAREHOUSE
HARDSTAND
DOCK OFC 1
DOCK OFC 2
DG STORE
POWER EASEMENT
SITE PLAN (GFA) UDA DEVELOPMENT SCHEME
SCALE: 1 : 1000
DRAFT
PROJECT:
FLAGSTONE LOT 104
Crowson Ln, North Maclean
Logan, QLD
TITLE:
SITE PLAN (GFA) PDA DEVELOPMENT SCHEME
DATE: SEPTEMBER, 2024
DRAWN BY: ST
SCALE: As indicated @ A1
24230
DA10
P1
watson young