Prospect Logistics Estate
Warehouse 7 Acoustic Assessment
for SSD10399 Modification
44 Clunies Ross Street Prospect, NSW

Client:
ISPT Pty Ltd

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Notice

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GLOSSARY

NOISE

Noise is produced through rapid variations in air pressure at audible frequencies (20 Hz – 20 kHz). Most noise sources vary with time. The measurement of a variable noise source requires the ability to describe the sound over a particular duration of time. A series of industry standard statistical descriptors have been developed to describe variable noise, as outlined in **Section 2** below.

NOISE DESCRIPTORS

L_{eq} – The sound pressure level averaged over the measurement period. It can be considered as the equivalent continuous steady-state sound pressure level, which would have the same total acoustic energy as the real fluctuating noise over the same time period.

$L_{Aeq(15\ Min)}$ – The A-weighted average equivalent sound level over a 15 minute period.

L_{A1} – The A-weighted noise level exceeded for 1% of the sample time.

L_{Amax} – The maximum A-weighted noise level.

L_{A90} – The A-weighted noise level that has been exceeded for 90% of the measurement duration. This descriptor is used to describe the background noise level.

RBL – Rating Background Level. The overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period (as opposed to over each 24hr period used for assessment background level) This is the level used for assessment purposes.

dB – Decibels. The fundamental unit of sound, a Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell. Probably the most common usage of the Decibel in reference to sound loudness is dB sound pressure level (SPL), referenced to the nominal threshold of human hearing. For sound in air and other gases, dB(SPL) is relative to 20 micropascals (μPa) = 2×10^{-5} Pa, the quietest sound a human can hear.

A-WEIGHTING

"A-weighting" refers to a prescribed amplitude versus frequency curve used to "weight" noise measurements in order to represent the frequency response of the human ear. Simply, the human ear is less sensitive to noise at some frequencies and more sensitive to noise at other frequencies. The A-weighting is a method to present a measurement or calculation result with a number representing how humans subjectively hear different frequencies at different levels.

1 INTRODUCTION

1.1 SUMMARY

Acoustic Dynamics is engaged by **Aliro Group** on behalf of **ISPT Pty Ltd** to conduct a desktop assessment of noise impacts associated with the proposed modification to Warehouse 07, within the proposed commercial development (Prospect Logistics Estate), located at 44 Clunies Ross Street, Prospect NSW.

This document provides a technical assessment and advice for planning, to ensure potential noise impacts are considered and addressed at the planning stage to achieve compliance with the relevant acoustic criteria and objectives.

It has been prepared in accordance with the requirements of Blacktown City Council, relevant Australian Standards, the NSW Environmental Protection Authority (EPA) and the NSW Department of Planning, Industry and Environment.

1.2 LOCATION OF AND DESCRIPTION OF DEVELOPMENT

The subject commercial estate is located at 44 Clunies Ross Street Prospect within a General Industrial (IN1) land zone. Warehouse 07 is located on the north western aspect of the site with Warehouse 01 and Warehouse 02 providing shielding to the adjacent sensitive receiver locations to the east.

Warehouse 07 is proposed to be utilized for food services processing and is seeking approval for 24 hour operations.

Access to Warehouse 07 will be via a driveway located at the north eastern side of the site with vehicular traffic flow arriving from the northern side of Clunies Ross Street.

Acoustic Dynamics advises that for the purpose of the acoustical assessment, the nearest sensitive receivers are:

- Residential receiver(s) located at 1 to 35 Muttong Street (to the east);
- Residential receiver(s) located at 31 and 33 Burraga Way (to the east);
- Residential receiver(s) located at 47 and 49 Muttong Street (to the south east); and
- Adjacent commercial receiver(s).

The assessment of the noise emission from Warehouse 07 to the nearest receivers is considered to be the worst-case scenario. Compliance at the assessed locations will ensure compliance at **all other** receivers located at distances further away.

The overall estate and Warehouse 07 site, surrounding area and receiver locations are shown in the Location Map, Aerial Image and Drawings presented within **Appendix A**.

1.3 SCOPE

Acoustic Dynamics is engaged to provide an acoustic assessment suitable for submission for the determination of an SSD modification. The scope of the assessment includes the following:

- Review of relevant legislation and criteria;
- Utilize background noise monitoring previously conducted on site to establish operational noise limits;
- Prediction of noise emission associated with the 24 hour use of Warehouse 07; and
- Provision of recommendations and noise controls required for modification approval.

2 RELEVANT ACOUSTIC CRITERIA AND STANDARDS

Acoustic Dynamics has conducted a review of the local council, state government and federal legislation that is applicable to the assessment of potential noise impacts associated with the development. The relevant sections of the legislation are presented below. The most stringent criteria which have been used in the assessment of noise impacts is summarised below.

2.1 BLACKTOWN COUNCIL REQUIREMENTS

2.1.1 LOCAL ENVIRONMENTAL PLAN

Acoustic Dynamics has conducted a review of Blacktown Council Local Environmental Plan (2015) and Holroyd Local Environmental Plan (2013) with the following relevant acoustic information contained within:

"6.9 Buffer area between industrial and residential zones

(1) The objectives of this clause are as follows—

(a) to maintain an adequate separation between general industrial land uses and residential land uses,

*(b) to prevent any likely adverse impacts of outputs of industrial land uses (including **noise**, vibrations, odours, fumes, smoke, vapour, steam, soot, ash, dust, waste water, waste products, grit or oil) on adjacent residential dwellings,*

(c) to ensure that neighbouring residents can enjoy a reasonable level of amenity without preventing the operation of general industrial land uses,

(d) to provide visual separation of the primary buildings and structures on industrial land from neighbouring residential dwellings.

(2) This clause applies to land identified as "Industrial-residential buffer area" on the Site Specific Provisions Map.

(3) Despite any other provision of this Plan, development must not be carried out on land to which this clause applies other than—

(a) if the land is in Zone R2 Low Density Residential—development permitted on land in that zone in the Land Use Table (excluding residential accommodation), or

(b) if the land is in Zone IN1 General Industrial—development permitted on land in that zone in the Land Use Table, but only if the consent authority is satisfied that the development is consistent with the objectives of this clause."

2.1.2 DEVELOPMENT CONTROL PLAN

A review of Blacktown *Development Control Plan (DCP) 2015* was conducted with the following relevant information contained within:

*"**4.5.3 Noise Pollution***

Any machinery or activity considered to create a noise nuisance must be adequately sound-proofed in accordance with the provisions of the Protection of the Environment Operations Act 1997.

The Environment Protection Authority may require certain premises to be licensed under the Protection of the Environment Operations Act 1979.

The use of mechanical plant and equipment may be restricted where sites are located near a residential area. Developments located near residential areas should be designed so that the development does not cause a noise nuisance.

6.4.9 Landscaping

Where car parking areas utilised at night are located within or adjacent to residential areas, consideration should be given to the location of lighting and driveways, and noise prevention measures (such as fencing and/or mounding), to avoid the loss of amenity of these residential areas."

and

*"**4.3 Consideration of adjoining land***

The likely level of noise to be emitted by the development, particularly its effect on the use of adjoining residential land. In general, noise generated by a development should not exceed the existing background sound pressure level by more than 5dB(A). A statement of compliance with this standard from an acoustic consultant may be required to be submitted with the DA."

2.2 NSW EPA'S ENVIRONMENTAL NOISE CRITERIA

The EPA, in its Noise Policy for Industry (NPfI) document published in October 2017, outlines and establishes noise criteria for industrial or other noise sources in various zoning areas.

Acoustic Dynamics advise that the following criteria have been applied for the assessment of the noise emission associated with the proposed use of the site.

Project Intrusiveness Noise Level

The intrusiveness noise level is determined as follows:

$L_{Aeq,\ 15min}$ = rating background noise level + 5 dB

where:

$L_{Aeq,\ 15min}$	represents the equivalent continuous (energy average) A-weighted sound pressure level of the source over 15 minutes.

and

Rating background noise level	represents the background level to be used for assessment purposes, as determined by the method outlined in Fact Sheets A and B.

Project Amenity Noise Level

The recommended amenity noise levels represent the objective for **total** industrial noise at a receiver location, whereas the **project amenity noise level** represents the objective for a noise from a **single** industrial development at a receiver location.

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:

Project amenity noise level for industrial developments = recommended amenity noise level (Table 2.2) minus 5 dB(A)

In accordance with the residential receiver categories of the NPfI, Acoustic Dynamics advises that the project amenity noise level is based on the "Urban" receiver type.

Acoustic Dynamics has relied on background noise logging previously conducted on site (as presented within the acoustic report prepared by White Noise Acoustics, dated 10 August 2020). The following table reproduces the background noise levels measured on site and the project noise trigger levels, as presented within the White Noise Acoustics report, and the modified project trigger noise levels.

Table 2.1 Measured Noise Levels and Project Noise Objectives

Location	Assessment Period	L_{A90} Rating Background Noise Level (RBL) [dB]	Measured L_{Aeq} [dB]	Project Intrusiveness Noise Level L_{Aeq} [dB]	Project Amenity Noise Level L_{Aeq} [dB]	Project Noise Trigger Level L_{Aeq} [dB]	Modified Project Trigger Noise Level L_{Aeq} [dB][2]
Northern Noise Logger Location	Day (7am to 6pm)[1]	52	58	57	58	57	**52**
	Evening (6pm to 10pm)	50	54	55	48	48	**43**
	Night (10pm to 7am)	44	52	49	43	43	**38**
Southern Noise Logger Location	Day (7am to 6pm)[1]	48	52	53	58	53	**48**
	Evening (6pm to 10pm)	46	51	51	48	48	**43**
	Night (10pm to 7am)	40	44	45	43	43	**38**

Note: 1) 8:00am to 6:00pm on Sundays and public holidays.

2) The Project Noise Trigger Level is the objective for the assessment of cumulative noise impacts associated with the entire commercial estate. The Modified Project Trigger Noise Level (i.e. criteria minus 5 dB) is the adopted objective for the assessment of on-site noise emission associated with the operation of individual warehouse units, to ensure the cumulative criteria can be met.

NB. Project noise trigger level is the lowest value of project intrusiveness or project amenity noise level after conversion to L_{Aeq} equivalent value. The EPA's NPfI specifies additional noise emission level corrections that should be applied when a noise source is determined to include "modifying factors" that can vary the perceived intrusiveness of a noise source. Such modifying factors include tonal, low frequency, or intermittent noise.

2.3 SLEEP DISTURBANCE

The NSW EPA has in the past investigated overseas and Australian research on sleep disturbance. The method of assessing noise for sleep disturbance relies on the application of a screening that indicates the potential for this to occur. The EPA's *Noise Guide for Local Government*, provides the following guidance for such a screening test:

> *"Currently, there is no definitive guideline to indicate a noise level that causes sleep disturbance and more research is needed to better define this relationship. Where likely disturbance to sleep is being assessed, a screening test can be applied that indicates the potential for this to occur. For example, this could be where the subject noise exceeds the background noise level by more than 15 dB(A). The most appropriate descriptors for a source relating to sleep disturbance would be $L_{A1(1\ minute)}$ (the level exceeded for 1% of the specified time period of 1 minute) or L_{Amax} (the maximum level during the specified time period) with measurement outside the bedroom window."*

Additionally, the guidelines of the NSW EPA's NPfI provide the following additional information:

> *"Where the subject development/premises night-time noise levels at a residential location exceed:*
>
> - *$L_{Aeq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or*
> - *L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is greater".*

Further to the above information, the following summarizes the sleep disturbance screening criterion:

$$L_{Amax} \text{ or } L_{A1(1\ minute)} < L_{A90} + 15\ dB(A)$$

In addition to the above, the EPA has previously published the following additional information relating to findings of significant research carried out for sleep disturbance:

> *"Maximum internal noise levels below 50-55 dBA are unlikely to cause awakening reactions… One or more noise events per night, with maximum internal noise levels of 65-70 dBA, are not likely to affect health and wellbeing significantly."*

Therefore in accordance with the NPfI guidelines detailed above, the following sleep disturbance screening criterion has been applied for this project:

Sleep Disturbance Criterion = 52 dB(A)

2.4 ROAD TRAFFIC NOISE CRITERIA

The EPA's Road Noise Policy (RNP) 2011 provides non-mandatory road traffic noise target levels for land use developments with potential to create additional traffic on existing local roads.

The RNP states:

> *"Some industries such as mines and extractive industries are, by necessity, in locations that are often not served by arterial roads. Heavy vehicles must be able to access these often more remote sites and this may mean travelling on local public roads. Good planning practice acknowledges this type of road use and develops ways of managing any associated adverse noise impacts.*
>
> *Where local authorities identify a 'principal haulage route', the noise criteria for the route should match those for arterial/sub-arterial roads, recognising that they carry a different level and mix of traffic to local roads."*

Table 2.1 shows the assessment criteria relevant to the assessment of the project.

Table 2.1 RNP Road Traffic Noise Assessment Criteria for Residential Land Uses

Road Category	Type of Project / Land Use	Assessment Criteria [dB]	
		Day (7am-10 pm)	Night (10 pm-7am)
Local Roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	55 $L_{Aeq,1hour}$ (external)	50 $L_{Aeq,1hour}$ (external)

Accepted application of Section 2.4 of the RNP is that where road traffic noise levels already exceed the assessment criteria, an increase of less than 2 dB represents a minor impact that is barely perceptible to the average person.

2.5 PROTECTION OF THE ENVIRONMENT OPERATIONS (POEO) ACT 1997

Noise emission from the any items of mechanical plant (i.e. condenser units, fans and exhausts) must also comply with the requirements of the relevant legislation, being the *Protection of the Environment Operations* (POEO) *Act 1997*. The POEO Act 1997 requires that the subject mechanical equipment must not generate "offensive noise".

Offensive noise is defined as follows:

> *"**"offensive noise"** means noise:*
>
> *(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:*
> *(i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or*
> *(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or*
> *(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations."*

3 NOISE EMISSION ASSESSMENT

The following section provides an assessment of the maximum cumulative noise impacts from noise sources associated with the use of Warehouse 07 at nearby sensitive receivers. The assessment location is defined as the most affected point on or within any sensitive receiver property boundary. Examples of this location may be:

- 1.5m above ground level;
- On a balcony at 1.5m above floor level; and
- Outside a window on the ground or higher floors, at a height of 300mm below the head of the window.

Note. To ensure noise impacts are adequately assessed, this report is based on an assessment of noise associated with **maximum capacity operations** and is assessed to the most stringent assessment period (being the night time). Demonstrated compliance with the night time criterion ensures compliance with the less stringent day time and evening criteria.

Although maximum capacity operations are unlikely to occur during the night time, the assessment is conducted in this conservative manner to ensure that even during a worst-case noise emission scenario, the amenity of neighbouring residents is protected.

The noise emission has been assessed based on the **maximum** capacity operations during the most sensitive assessment period (i.e. night-time) and the modelling assumptions as presented in **Section 3.1.2** and **Section 3.1.3**.

3.1 NOISE MODEL ASSUMPTIONS AND SCENARIO

3.1.1 MODEL CONFIGURATION

Acoustic modelling was undertaken using computer modelling software (CadnaA Version 2021) to predict operational noise levels generated by the development. CadnaA calculates environmental noise propagation according to the applicable ISO standards, including the ISO 9613 algorithm.

The ISO 9613 algorithm is based on a moderately well-developed temperature inversion or source to receiver wind. Ground absorption, reflection and relevant shielding objects are taken into account in the calculations. Topographical contour information (obtained from NSW Sixmaps) was imported to the model as 10m contours.

3.1.2 NOISE MODEL ASSUMPTIONS

The following assumptions were made with regard to the configuration of the noise model:

- A ground absorption coefficient of 0.5 is used throughout the model;
- All development site buildings and façade have been modelled as a 'smooth façade/reflective barrier', and the calculations have been configured to include 3-orders of reflections;
- All source sound power levels are taken from manufacturer data or our extensive library of noise source data;
- All vehicles driving on site are modelled at an average speed of 15 km per hour;
- All fixed mechanical plant modelled located in the proposed plant platform and venting to the rooftop area above;
- Maximum capacity use of internal areas of the warehouse; and
- Maximum capacity use of the loading dock areas.

Note. It is highly unlikely that all mechanical plant or noise generating activities would be occurring at maximum capacity simultaneously and certain types of equipment would be used on site for only brief periods during certain activities. Therefore, the noise modelling predictions are considered conservative.

3.1.3 MODELLING SCENARIO

Acoustic Dynamics has conducted modelling of a worst-case noise emission scenario as follows:

Noise Emission Scenario

- All mechanical noise sources operating simultaneously and continuously, over any 15-minute period;
- 40 passenger vehicles accessing the site per hour;
- 10 heavy vehicles accessing the warehouse per hour;
- The use of diesel forklifts at each of the loading dock areas;
- Heavy vehicles idling in the loading dock area;
- Maximum capacity use of the internal warehouse areas.

NB: All listed noise sources and activities assumed to be operating simultaneously and continuously, over any 15-minute period during the assessment period. It is highly unlikely that all equipment would be operating at their maximum sound power levels at any one time and certain types of equipment would be used on site for only brief periods during certain activities. Therefore, the noise modelling predictions are considered conservative.

3.1.4 SOURCE SOUND POWER LEVELS

Sound power levels associated with the use and operation of Warehouse 07 are presented in **Table 3.1**. At this stage of the proposal, the specifics regarding mechanical plant and integrated fitout equipment is yet to be finalised. Acoustic Dynamics has conducted the assessment based on the provided planning information and our experience with assessing similar types of developments. Typical equipment noise levels have been obtained from manufacturer data and our library of noise emission data.

Table 3.1 Equipment Details and Sound Power Levels

Source	Typical Noise Levels[1]
Refrigeration condenser unit (x10)	SWL = 80 dB(A) per unit
Glycol compressor unit (x2)	SWL = 88 dB(A) per unit
CO2 compressor unit (x2)	SWL = 95 dB(A) per unit
Tube steam boiler (x2)	SWL = 76 dB(A) per unit
15kW air compressor (x2)	SWL = 72 dB(A) per unit
Hot water pump (x2)	SWL = 78 dB(A) per unit
Diesel forklift (x2)	SWL = 94 dB(A) per vehicle
Passenger vehicle entering/exiting the site (15 km/hr)	SWL = 81 dB(A) per vehicle
Medium rigid vehicle entering/exiting the site (15 km/hr)	Wheel SWL = 92 dB(A)
	Engine SWL = 97 dB(A)
	Exhaust SWL = 97 dB(A)
Medium rigid vehicle idling	SWL = 95 dB(A) per vehicle
Warehouse (Internal)	Reverberant L_{Aeq} = 97 dB(A)
Mechanical plant in ceiling void (Internal)	Reverberant L_{Aeq} = 80 dB(A)

Note: 1) Octave band levels have not been displayed, however have been used in the CadnaA modelling.

3.2 OPERATIONAL NOISE ASSESSMENT PREDICTIONS

The calculated maximum external noise emission levels at the nearest receiver locations are presented in **Table 3.2** below, assessed against the relevant noise emission criteria.

It is advised that by achieving compliance with the nearest receiver locations, compliance will also be achieved at those further away.

The predicted noise emission levels presented below in **Table 3.2** include allowances for relevant distance, direction and shielding losses. Acoustic Dynamics advises, although unlikely to occur, the worst-case cumulative impact of the noise emission scenario is presented within **Table 3.2**, demonstrating compliance with the noise impact criteria and objectives.

Table 3.2 External Predicted Noise Emission Levels & Relevant Criteria – Nearest Receivers

Residential Receiver Location	Assessment Period[1]	Activity / Noise Source[2]	Calculated Maximum L_{Aeq} Noise Level [dB]	EPA NPfI $L_{Aeq(15minute)}$ Adopted Noise Emission Objective [dB]	Complies?
Residential Receiver(s) at 1 to 35 Muttong Street	Night (10:00pm to 7:00am)	Mechanical Plant	16	**38 (Night)**	**Yes**
		Operations	14		
		Vehicles	29		
		Total	**29**		
Residential Receiver(s) at 31 and 33 Burraga Way	Night (10:00pm to 7:00am)	Mechanical Plant	15	**38 (Night)**	**Yes**
		Operations	14		
		Vehicles	33		
		Total	**33**		
Residential Receiver(s) at 47 and 49 Muttong Street	Night (10:00pm to 7:00am)	Mechanical Plant	24	**38 (Night)**	**Yes**
		Operations	24		
		Vehicles	20		
		Total	**28**		
Adjacent Commercial Receiver(s).	Night (10:00pm to 7:00am)	Mechanical Plant	15	**65 (When in Use)**	**Yes**
		Operations	13		
		Vehicles	36		
		Total	**36**		

Note 1) Daytime being 7:00am to 6:00pm on weekdays and Saturdays and 8:00am to 6:00pm on Sundays and public holidays. Compliance with the more stringent night time criteria ensures compliance during the day and evening periods.

2) The description of the activities and noise sources for the scenario is detailed in **Section 3.1.3**.

3) Noise levels are predicted to comply with the adopted noise objective inclusive of a + 5 dB correction for noise character.

3.2.1 SLEEP DISTURBANCE ASSESSMENT

To assess any potential for sleep disturbance, maximum noise levels due to instantaneous noise events (such as vehicle door slams, transient loading back noises and heavy vehicles accessing the site) were calculated at the nearest sensitive receiver using CadnaA noise modelling software.

Modelling results indicate received noise levels resulting from transient noise events during the night-time assessment period 10:00pm to 7:00am, determined the potential maximum $L_{A1(60\ Sec)}$ noise emission to be **45 dB**. Maximum noise levels would be dominated by the heavy vehicles accessing the site during the night time period.

These events are predicted to **achieve compliance** with the EPA's sleep disturbance screening criterion of $\mathbf{L_{A1(60sec)} \leq 52\ dB}$ during night-time hours.

Acoustic Dynamics advises that although there may be instantaneous noise events (i.e. a vehicle door slamming, a heavy vehicle accelerating or instantaneous noise events) that exceed the external sleep disturbance criterion ($\mathbf{L_{A1(60sec)} \leq 52\ dB}$) at the nearest residential receivers, the maximum instantaneous internal noise levels are predicted to comply with the internal noise guideline ($\mathbf{L_{AMax} \leq 45\ dB(A)}$) and is unlikely to cause awakening reactions.

It is advised that by achieving compliance with the nearest residential receiver locations, compliance will also be achieved at all other residential receiver locations further away.

3.2.2 ROAD TRAFFIC NOISE ASSESSMENT

Acoustic Dynamics understands that vehicles will access the site via the northern side of Clunies Ross Street. Vehicles utilizing local roads are assessed with consideration to the RNP $L_{Aeq,1hr}$ criteria outlined earlier in **Section 2.5**.

The calculated maximum noise emission levels at sensitive residential receivers, due to the vehicles utilizing surrounding local roads, are presented in **Table 3.3** below. It is advised that by achieving compliance with the nearest residential locations, compliance will also be achieved at all other residential receiver locations further away.

Table 3.3 Modelled Sensitive Receiver Daytime $L_{eq,1hr}$ Sound Pressure Level

Most Affected Receiver	Relevant $L_{Aeq,1hr}$ Objective [dB][1]	Predicted $L_{eq,1hr}$ Sound Pressure Level [dB][2]	Complies? (Yes/No)
Receivers Located On Surrounding Roads	$L_{Aeq,\ (1\ hour)}$ 50 (external) **Night (10pm – 7am)**	< 40	**Yes**

Note: 1) Night criterion applies for the time period 7:00am to 10:00pm.

2) Predicted L_{Aeq} noise level is the maximum noise level within a 1_{hr} period.

Based on the above, Acoustic Dynamics advises that the noise emission due additional traffic as a result of the activity of the proposed development will achieve compliance with the NSW EPA's Road Noise Policy.

4 DISCUSSION

Noise emission has been assessed as worst-case scenario (being maximum capacity operations) occurring during the most sensitive assessment period. The predicted maximum noise emission results associated with the use of Warehouse 07 (inclusive of the acoustic planning recommendations outlined in **Section 5**) indicate the following:

1. The results of the noise modelling and predictions demonstrate that the site represents an appropriate location for a 24 hour food processing facility;

2. There is low risk of acoustic disturbance for the adjacent residential receivers during the night time assessment period and during all other assessment periods (day/evening);

3. The noise generating activity that has most potential to cause an impact to adjacent residential receivers during the night time (or early morning) period would be heavy vehicle movements. Noise emission has been assessed as a worst-case scenario (i.e. maximum number of vehicle movements per hour), however Acoustic Dynamics understands that vehicle numbers are likely to be lower than those used in the assessment of noise emission;

4. There is low risk of acoustic disturbance (inclusive of sleep disturbance) to all nearby residential receiver properties during the night time and early morning assessment period;

5. There is low risk of acoustic disturbance to the adjacent commercial receivers;

6. Noise emission associated with vehicles utilizing the surrounding local roads is predicted to comply with the EPA's *Road Noise Policy (RNP) 2011* at all nearby residential receivers; and

7. To ensure the assessment is conducted in a conservative manner, noise emission has been assessed as a **worst-case** scenario (i.e. all noise generating activities and noise sources occurring simultaneously and at maximum capacity). Generally, the noise emission associated with the proposed use and operation of the warehouse would be lower than the predicted results presented in **Table 3.2** above.

5 PLANNING RECOMMENDATIONS

The predicted noise emission results indicate that noise emission resulting from the 24 hour use and operation of Warehouse 07, at all nearby sensitive receivers, can be designed to **comply** with the noise emission requirements of Council and the NSW EPA, provided suitable design recommendations are implemented at the planning stage.

5.1.1 MECHANICAL PLANT

Acoustic Dynamics advise that at this stage of the proposal, the selection and location of mechanical plant has not been finalised. To ensure the use of the mechanical plant complies with the *Protection of the Environment Operations* (POEO) *Act 1997*, the requirements of Council and the EPA, it is advised the following mechanical plant recommendations be implemented in to the design:

1. All items of fixed mechanical plant should be installed in the proposed refrigeration plant room and miscellaneous plant room. The proposed design and construction of the plant rooms should be reviewed prior to construction certification to ensure appropriate attenuation will be achieved;

2. Mechanical plant should be selected on the basis of low noise emissions. The cumulative mechanical plant noise emission level, when measured anywhere along the eastern boundary of the logistics estate should not exceed the background noise level;

3. Installation of in-duct silencers and attenuators to control noise levels at end of duct;

4. Ensuring all exposed duct work is lined with a suitably dense acoustic material or wrap;

5. All items of mechanical plant should be isolated from the building structure through the use of resilient mounts, resilient sleeves and or spring hangers;

6. Reduce mechanical plant vibration through inspection and where necessary maintenance and repair of any fans, motors or ductwork. Inspection and maintenance should include motors, shafts, bearings, belts and tightening of any loose parts or connections; and

7. Once a detailed mechanical schedule and layout has been determined, an acoustic consultant should be engaged to provide a review and recommendations to ensure mechanical noise emission is adequately controlled.

5.1.2 TENANCY NOISE EMISSION

At this stage of the proposal, specifics regarding the integrated fitout equipment and mechanical services schedule/layout are yet to be determined.

Acoustic Dynamics conducted noise modelling based on published data for similar food processing facilities, i.e. maximum internal reverberant noise level of L_{Aeq} 97 dB(A) within the warehouse.

Acoustic Dynamics understands that the proposed construction of the warehouse is to be:

- Sheet metal cladding to the walls, roof and internal ceiling;
- Workshop and plant areas to be constructed using full height 150mm thick pre-cast concrete panel; and
- 150mm thick pre-cast concrete panel to the perimeter of the warehouse to a height of 2.4 metres.

Noise emission associated with the use of Warehouse 07 has been assessed in accordance with the conservative assumptions listed in **Section 3.1**. To ensure the use of the tenancies does not impact neighbouring tenancies and properties, it is advised the following recommendations are implemented.

1. It is advised an acoustic consultant review the internal design, integrated fitout and facade construction, to ensure appropriate acoustic isolation will be achieved;

2. Typical noise controls that can be implemented in to the fitout may include:
    - Selection of low noise emitting plant;
    - Use of damping material on steel product interfaces;
    - Use of damping material in chutes, hoppers and conveyors;
    - Reduction of product drop heights;
    - Installation of silencers to air exhaust systems;
    - Acoustic barriers and baffles used to isolate noisy equipment or activities;
    - Use of absorptive lining materials to reduce internal reverberation; and

3. It is advised that a condition be written in to the tenancy lease agreement that includes the following:

    "The tenant shall provide airborne and structure-borne noise controls to ensure the acoustic amenity of adjacent tenancies and properties is adequately protected. Noise levels associated with the use of the tenancy must achieve compliance with the noise emission objectives of Council and the NSW EPA.".

Further to the above, Acoustic Dynamics advise that noise emission resulting from the operation of the integrated fitout can be appropriately conditioned to protect the acoustic amenity of the adjacent sensitive receivers.

5.1.3 LOADING DOCKS & WASTE COLLECTION

At this stage of the development, the loading dock activity and waste collection schedule is yet to be determined. Due to the shielding provided by the warehouse to the loading dock areas, it is likely that noise associated with other regularly occurring activities on site (i.e. vehicle access and warehouse activity) will be the contributing factor to noise emission from the site.

Without the specific operating details of the loading docks and waste collection areas, it is challenging to prescribe explicit noise controls. However, following approval of the development application and prior to construction certification, a qualified acoustic consultant should be engaged to provide suitable advice and recommendations for the design of the loading dock and waste control areas and to provide appropriate noise management measures.

To ensure the use of the loading docks and waste collection areas does not cause unreasonable disturbance, the following practicable acoustic control measures should be implemented by the site operator. Suitable controls would include:

1. Limiting the frequency of waste collection;
2. Limiting waste collection to weekday, daytime hours only;
3. Signage at the entrance of the site advising drivers switch off engines during deliveries/collections;
4. Signage at the entrance of the site advising drivers switch off refrigeration units whilst on site;
5. Signage at the entrance of the site advising drivers restrict the use of air brakes when in close proximity to residential properties;
6. Training and induction of all staff in appropriate behaviour and use of the loading dock and waste collection areas; and
7. Roller doors to loading dock areas should be kept closed following the completion of vehicle access.

5.1.4 REVERSING ALARMS

Acoustic Dynamics advises that the use of tonal reversing alarms has the potential to cause disturbance to neighbouring residential properties.

To ensure impacts are minimised, Acoustic Dynamics recommends the incorporation of broadband reversing alarms on all vehicles used on site. The broadband reversing alarm will reduce the tonal aspects of the traditional beeping alarm and will maintain the safety of the workers on site.

Further to the above, noise impact associated with alarms can be addressed via the following measures:

1. Where feasible, reduce the need for reversing alarms by implementing drive-through vehicle access paths;

2. “Smart” broadband alarms should be installed to all site vehicles and mobile machinery (i.e. forklifts or loaders) and should be programmed to operate at a suitable volume;

3. In addition to broadband alarms, site vehicles and mobile machinery should be fitted with flashing lights and reversing cameras;

4. Ensure that the broadband alarm is mounted in an ideal position on the vehicle or machinery;

5. Staff are to be provided with appropriate instruction and training to ensure safe and appropriate manoeuvring procedures.

6 CONCLUSION

Acoustic Dynamics has conducted an acoustic assessment of the noise emission resulting from the use and operation of the proposed 24 hour food processing facility, located within Warehouse 07, at 44 Clunies Ross Street, Prospect.

A review of applicable noise standards and local authority noise criteria was conducted. Noise levels were assessed in accordance with the requirements of:

(a) Blacktown Council;
(b) The NSW EPA;
(c) The NSW Department of Planning, Industry and Environment ;and
(d) Australian Standards.

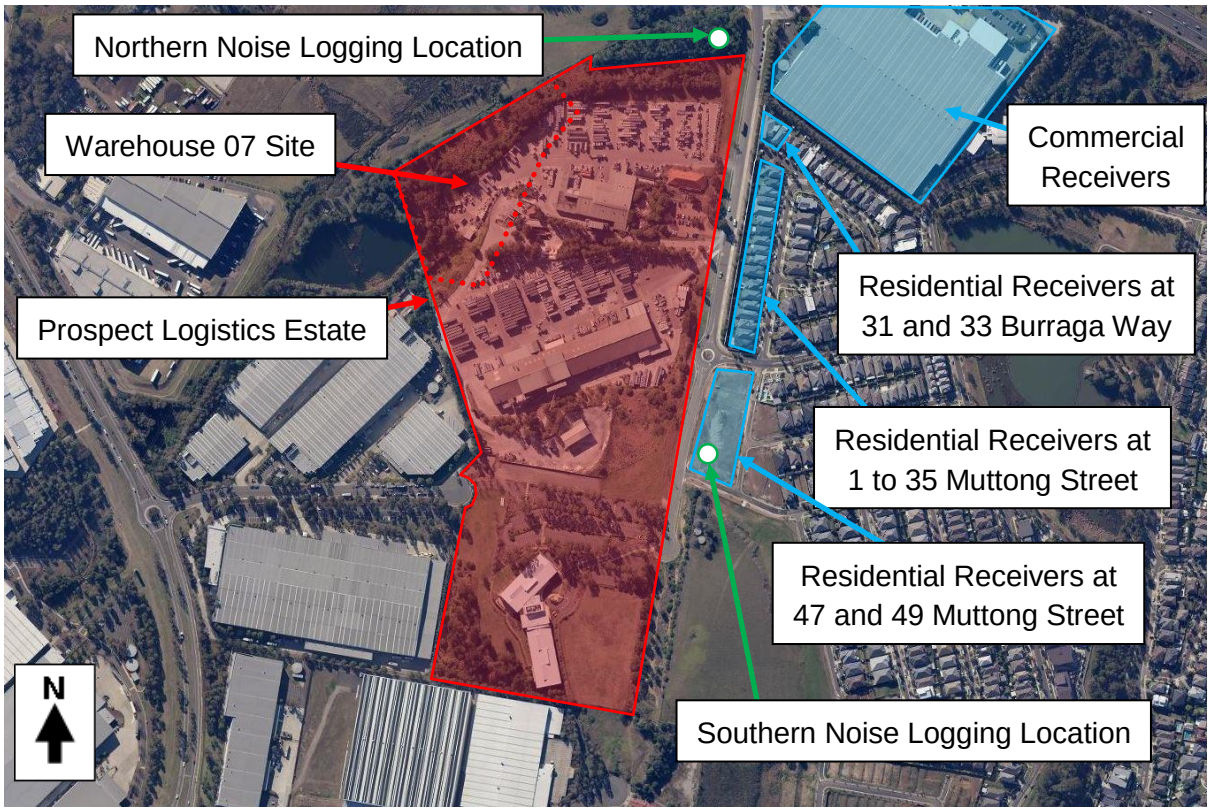
Further to the assessment conducted, our review of the relevant acoustic criteria and our calculations, Acoustic Dynamics advises that noise emission associated with the proposed facility can be designed to comply with relevant noise emission criteria of Blacktown Council and the NSW EPA, subsequent to the incorporation of the recommendations outlined within Section 5.

We trust that the above information meets with your requirements and expectations. Please do not hesitate to contact us on 02 9908 1270 should you require more information.

APPENDIX A – LOCATION MAP, AERIAL IMAGE AND DRAWINGS

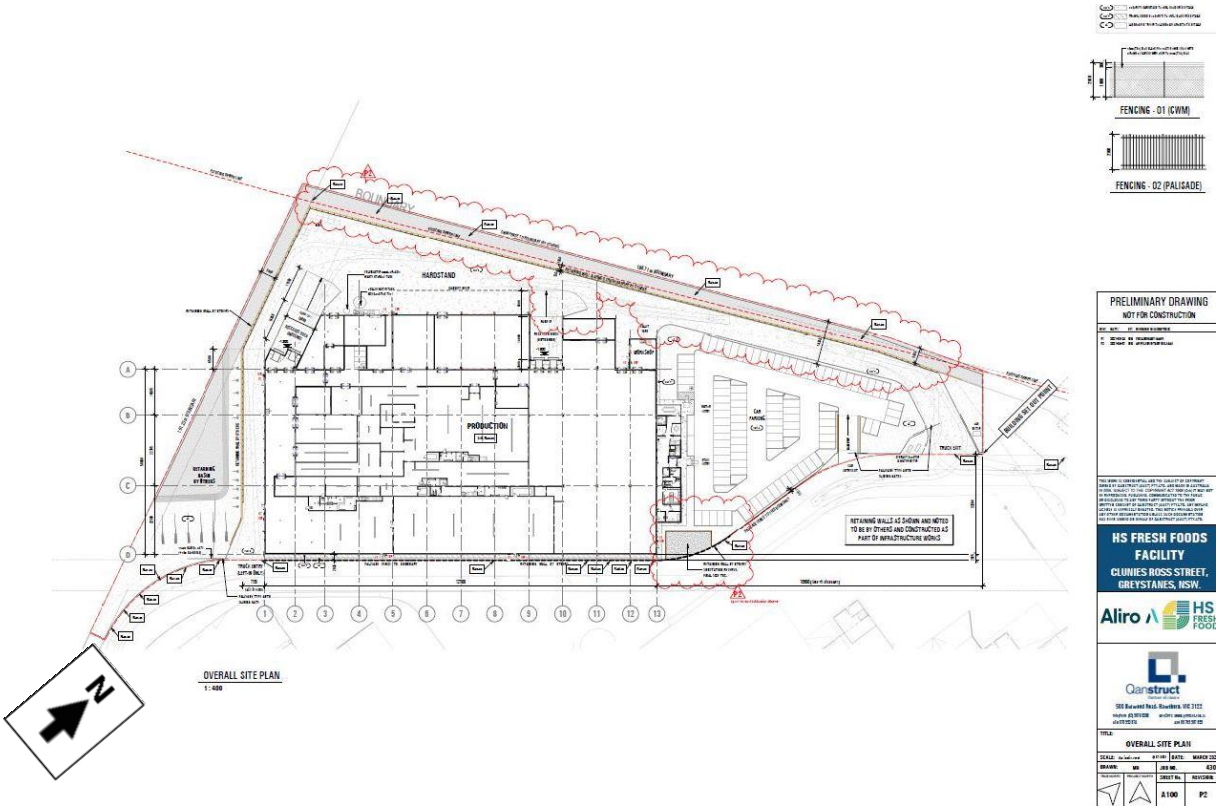
A.1 LOCATION MAP

A.2 AERIAL IMAGE (COURTESY OF SIXMAPS)

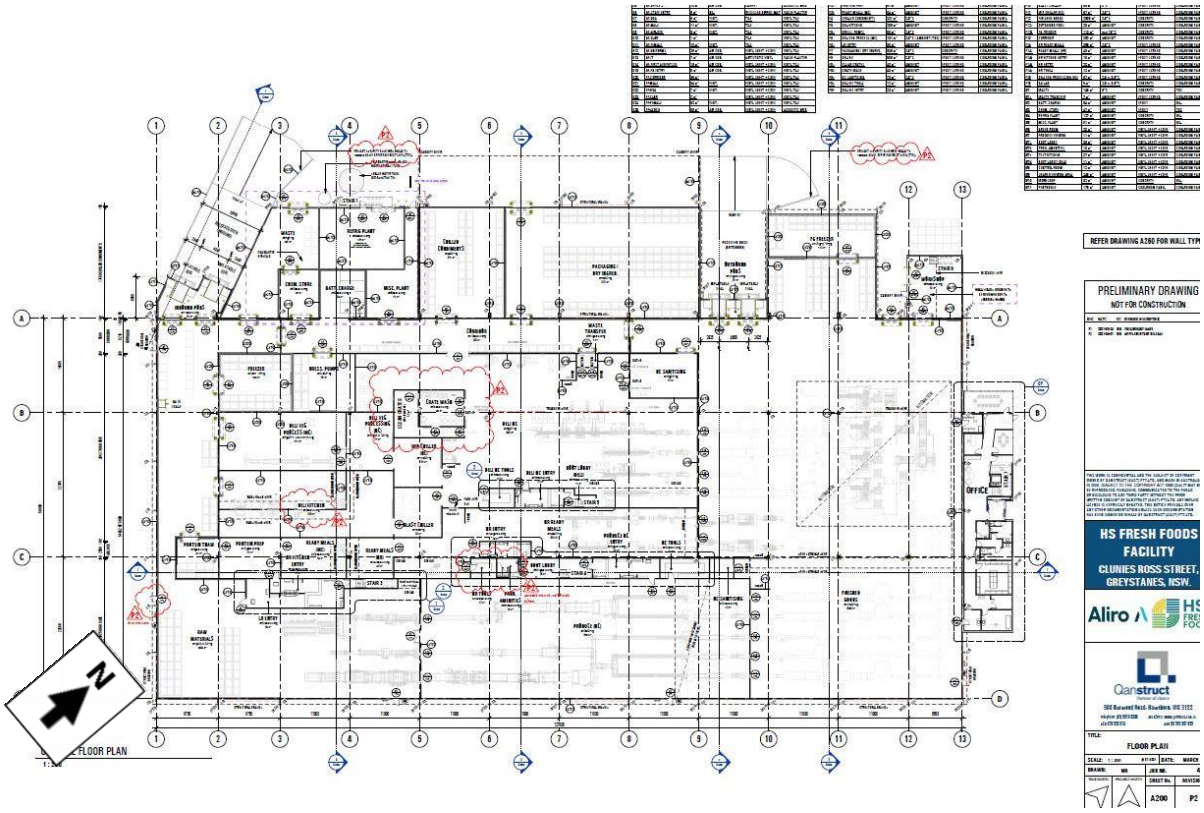


A.3 DRAWINGS

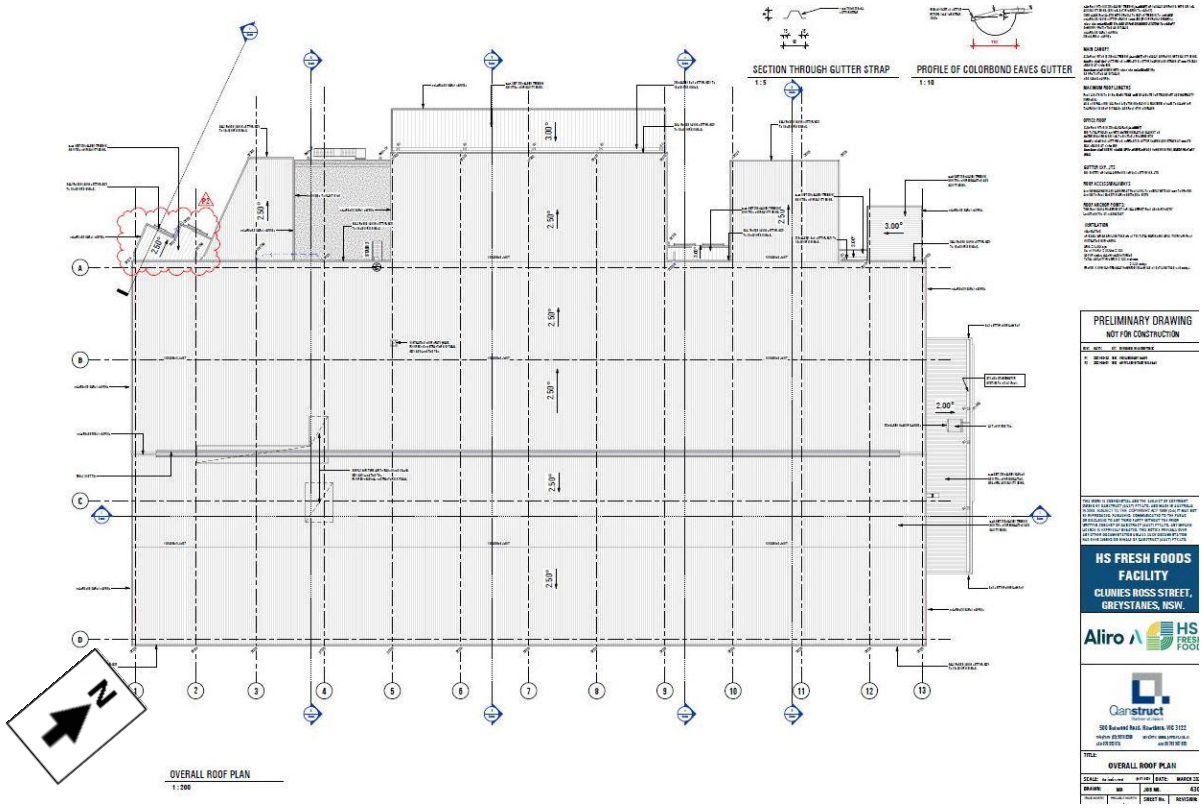
A.3.1 OVERALL SITE PLAN



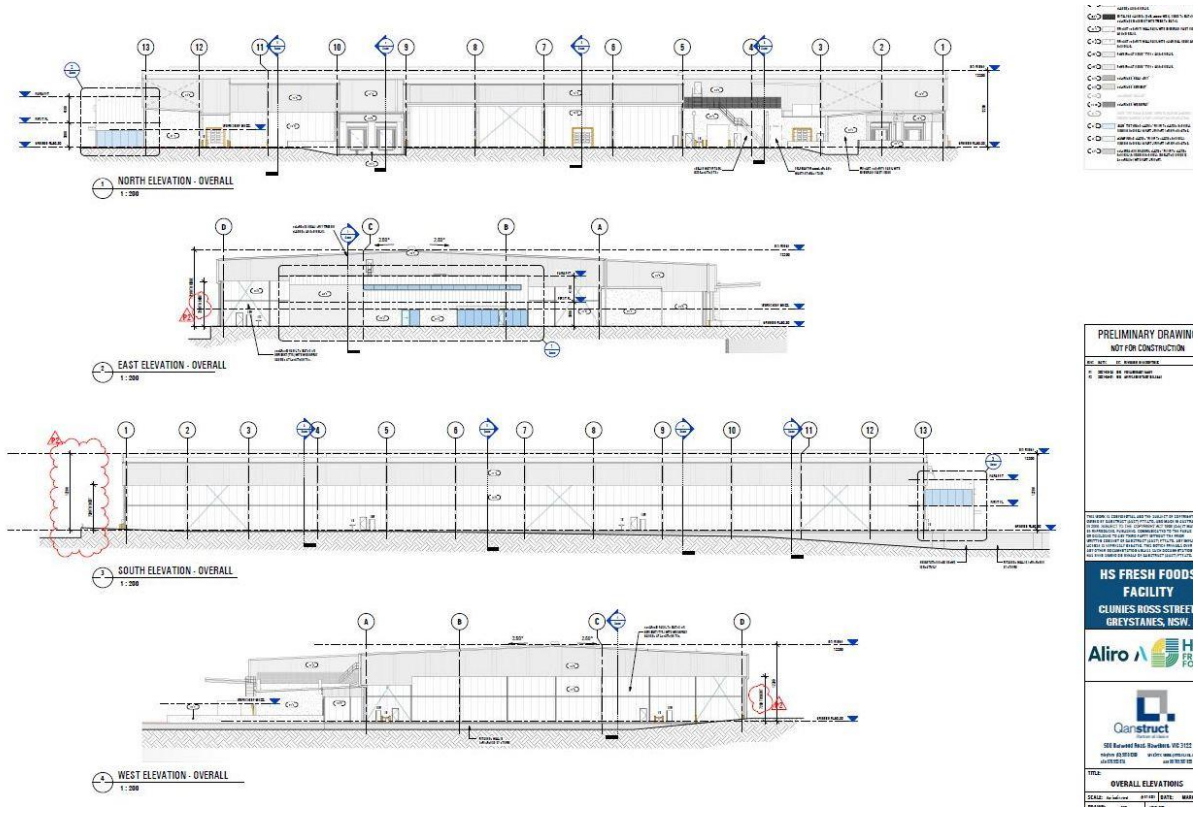
A.3.2 FLOOR PLAN



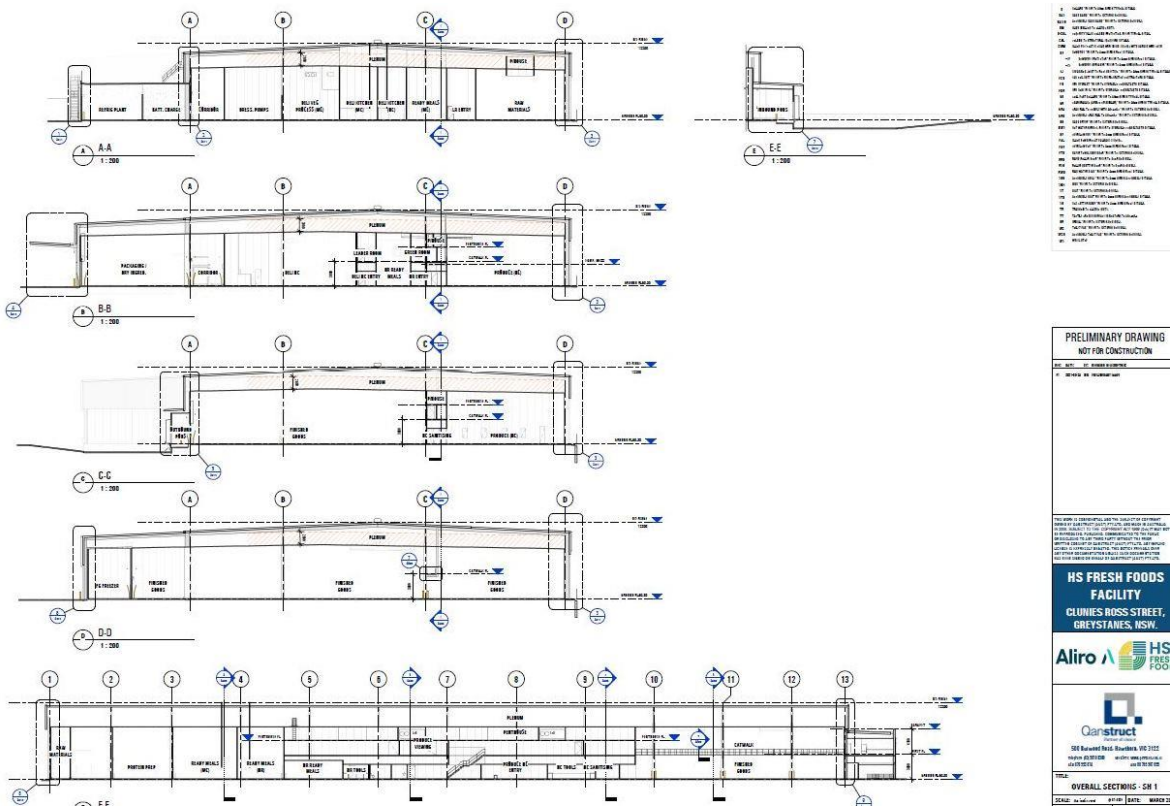
A.3.3 OVERALL ROOF PLAN



A.3.4 OVERALL ELEVATIONS



A.3.5 OVERALL SECTIONS



A.3.6 WALL TYPES