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### **ACOUSTICS ASSESSMENT**

#### **Cold Storage Extension**

**No. 24-27 Lambridge Place**

**Penrith NSW**

**Report: BGMA 170709 A**

**Date: October 2017**

**Prepared For: GIBSON SIX**

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**MAAS MASA MIEAust NCAC**

**BGMA Pty Ltd**

## **Introduction**

“Food Boss” provides cold storage warehousing and Australia wide refrigerated transport at its site at No. 24-27 Lambridge Place, Penrith.

Cold storage capacity on site is to be increased in size.

The footprint of the existing building is about 36 metres east-west by about 55 metres north-south (existing cold storage area about 1,500 m<sup>2</sup>) with a building height of about 11.5 to 14.0 metres.

The footprint of the new addition is to be about 80 metres east-west by about 30 metres north-south (additional cold storage area about 2,400 m<sup>2</sup>) with a building height of about 15.5 to about 17.5 metres.

The expansion will also include refrigeration equipment to service the new warehouse.

BGMA Pty Ltd, acoustical consultants, has been engaged to provide a noise assessment for the proposed on site extension.

## **Area Description**

This facility is located about 2 kilometres north of the centre of Penrith near Castlereagh Road.

The site is about 275 metres east of Castlereagh Road and about 235 metres south of Andrews Road. Castlereagh Road connects Penrith through to Richmond.

About two kilometres west of Castlereagh Road, Andrews Road connects to the A9 (The Northern Road) between Penrith and Richmond & Windsor.

The area on the western side of Castlereagh Road and south of Andrews Road is commercial/industrial. On the eastern side, south of the site, commercial/industrial extends about 1,250 metres south.

The nearest residences are about 385 metres to the north (Cranebrook) on the northern side of Andrews Road, and about 900 metres to the east-north-east and about 1,000 metres to the east-south-east (Penrith).

## **Site Description**

The site is essentially in two parts.

The western end (containing the existing building) is about 80 metres east-west by 75 metres north south.

The existing building is offset about 2.35 metres from the northern boundary, extending about 55 metres further south and about 36 metres to the west. An office area extends a further 10 metres to the south [eaves 11.3 metres; ridgeline 14 metres]

The eastern end (containing the proposed extension) is about 120 metres east-west by 50 metres north-south.

The proposed refrigerated warehouse is offset about 3.74 metres from the northern boundary, extending about 29 metres further south and about 80 metres to the east [eaves 15.6 metres; ridgeline 17.3 metres]

The **existing building** extends about 34.5 metres further to the south than the proposed warehouse. [In the corner, thus created, will be loading dock with “heat exchangers” located above].

The main part of the existing building has loading docks on the western side and cold storage on the eastern side. The loading dock is about 7.5 metres east-west. At the northern end of the loading dock area is the compressor room (7.5 metres east-west by about 12.5 metres north south).

The locking dock area is about 7.5 metres east-west by 42.5 metres north-south with five (5) loading bays. Trucks back the rear of the refrigerated trailers into the 'close fitting' opening of the loading bay.

Electric forklifts move the pallets from cold storage, into the loading dock area, and hence into the refrigerated trailers. (The process is reversed for product arriving). Automated doors to the cold storage maintain the cold store internal temperature, and the automated doors & sealing of the loading dock area minimises any heat gain that might occur between cold storage & truck.

Essentially, the cooling is split-system refrigeration. Compression occurs within the 'compressor room'. Heat rejection occurs externally via a bank of heat exchangers. Decompression chills the coolant that flows to the cold store heat exchangers that extract heat from the insulated cold store.

The **proposed refrigerated warehouse** extends 80 metres east and 29 metres wide in an area 120 metres east by 50 metres south.

This building is about 18.75 metres from the southern boundary (and the nearest commercial neighbours). This strip 18.75 metre wide strip along the southern side of the proposed warehouse allows heavy vehicle access.

At the eastern end of the proposed warehouse building, there is an area about 40 metres east-west by 50 metres north-south. This area contains a central car parking island for seven (7) vehicles. Between the central car parking island and the rear boundary will be a truck refuelling point.

There will be a **loading dock** in the corner between existing building & proposed warehouse. This will be in two parts.

The first part (about 13.4 metres high), in the corner, is about 19 metres east-west by 6.3 metres north-south with one loading bay.

The second part (about 6.45 metres high) is in the corner between the first part of the loading dock & the existing building. This latter area is about 13 metres east-west by about 8.7 metres north-south about 6.45 metres high with a second loading bay. Heat exchangers will be located above this section.

Equipment within the existing compressor room is to be upgraded. The proposed insulated warehouse will have internal heat exchangers for heat extraction.

The heat exchangers on top of the new additional loading docks will provide heat rejection.

### **Nearest Neighbours – Existing Building**

The existing building plus admin area (65 metres north-south by 36 metres east-west) is about 44 metres from the western boundary, about 70 metres from the centreline of Lambridge Road (western side), and about 90 metres from commercial/industrial buildings beyond.

The main bulk of the existing building is located about 17.5 metres from the southern boundary, about 28 metres from the centreline of Lambridge Road (southern side) and about 55 to 60 metres from buildings on the southern side of Lambridge Place.

The southern end of the existing building is located about 45 metres from commercial/industrial buildings directly east of the southern end of the existing building at No. 21 Lambridge Place.

The existing building is about 2.35 metres from the northern boundary.

The north-western corner is about 21 metres from the south-east corner of the rear of the nearest commercial/industrial buildings beyond at No. 190 Andrews Road.

The north-eastern corner is about 120 metres (perpendicular) from the rear of the nearest commercial/industrial buildings to the north at No. 182-184 Andrews Road.

### **Nearest Neighbours – Proposed Building**

The proposed refrigerated warehouse (29 metres north-south by 80 metres east-west) is about 40 metres of the eastern boundary. This makes it about 65 metres from administration building of the glassworks to the east, and about 160 metres from the main glassworks building beyond.

The proposed refrigerated warehouse is about 70 metres from buildings on the south side of Lambridge Place.

The proposed refrigerated warehouse is about 3.75 metres from the northern boundary.

On the northern side, the western half of the proposed refrigerated warehouse is about 120 metres (perpendicular) from the rear of the nearest commercial/industrial building to the north at No. 182-184 Andrews Road.

On the northern side, the eastern half of the proposed refrigerated warehouse is about 23 metres (perpendicular) from the rear of the nearest commercial/industrial building to the north at No. 174 Andrews Road.

On the southern side, the eastern half the proposed refrigerated warehouse is about 18.75 metres from the southern boundary, and the rear wall of the commercial/industrial buildings at No. 20-21 Lambridge Place.

The proposed loading dock sits in the corner between existing building & proposed refrigerated warehouse.

### **Closest Potentially Worst Affected Receiver**

#### **No. 21 Lambridge Place**

This receiver area requires additional description.

The commercial units within No. 20-21 Lambridge Place fall within an area about 70 metres east-west by 60 metres north south with an east-west central aisle about 20 metres wide.

Within the northern block, the northern, eastern & western walls appear to be stand-up concrete panel construction, about 7 to 8 metres high, with an Rw rating of 50 dB or greater, totally devoid of openings. The southern facade, facing away from the proposed development, contains doors, openings and glazing that would be shielded by the bulk of this block

Within the southern block (about 40 metres from the site boundary), the southern, eastern & western walls again appear to be stand-up concrete panel construction, about 7 to 8 metres high, with an Rw rating of 50 dB or greater, totally devoid of openings. This time it is the northern facade that has doors, openings and glazing that need to be addressed because they face toward the site.

The roof construction is likely to profiled sheet metal decking interspersed with translucent panelling and thus susceptible to noise penetration.

### **Nearest Potentially Residential Neighbours**

The area still contains two major industrial noise sources areas, the “0-1 Sydney” glassworks (formerly ACI) and Crane Copper Tube (formerly Crane Enfield).

The first of these is located across the eastern boundary of the “Food Boss” site at about 120 metres away. The second is about 300 metres to the south.

As I understand, the Operating Consent Conditions of both the "O-1 Sydney" glassworks & Crane Copper Tube were based on 'background plus 5' at the nearest residential areas.

For the "O-1 Sydney" glassworks, the nearest residential area was formerly taken as being at about 600 to 700 metres to the north-east.

For Crane Copper, the nearest residential area was formerly taken to being at about 1,000 metres to the east.

On the northern side, the nearest residential area to the site is about 385 metres to the north (Cranebrook) on the northern side of Andrews Road. There are other nearby residential areas at about 900 to 1000 metres to the east-north-east & to the east-south-east (Penrith).

The nearest residences to the north (Cranebrook) would be exposed to the warehouse noise emissions **but** shielded from the loading dock & heat exchangers noise emissions.

*These nearest residences are also located behind substantial noise barriers that significantly exceed the height of the two storey residences beyond.*

The nearest residences to the east-north-east & east-south-east (Penrith) would be exposed to the warehouse noise emissions & the loading dock & heat exchangers noise emissions.

*These nearest residences are partially shielded by the glassworks and by the buildings at No. 21 Lambridge Place.*

*At a distance of about 900 metres, preliminary calculations indicated that by achieving the commercial noise limit criteria, the resulting sound level at these nearest residents would be 35 dB(A) or less.*

## **Criteria**

The site will need to comply with the NSW Industrial Noise Policy. For the site to be acceptable, it should not be a source of 'offensive noise'.

'Offensive noise' is defined within the protection of Environmental Operations Act' (1997) as meaning:

'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.'

The general Amenity Noise "ceiling" for potentially affected residences would be a recommended  $L_{Aeq,15min}$  noise limit of 45 dB(A) if considered "suburban", and 45 dB(A) if considered "urban" for residential premises. It is most likely the local area would be dominated by industrial noise.

Were residential receivers be sufficiently impacted, the Intrusiveness Criteria of 'background plus 5 dB(A)' as well as the Amenity Noise Level, needs to be considered.

*Preliminary and subsequent calculations indicated, the resulting sound level at the nearest residents is most likely to be 35 dB(A) or less, which would require a local area 'background' of 30 dB(A) or less.*

*Any residential receivers are therefore no longer considered.*

The general Amenity Noise “ceiling” is a recommended  $L_{Aeq,15min}$  noise limit of 65 dB(A) to nearby commercial premises and 70 dB(A) to nearby industrial premises. For commercial & industrial receivers, only the Amenity level is considered.

### **Construction of the Proposed Refrigerated Warehouse**

The proposed refrigerated warehouse is to be 29 metres north-south by 80 metres east-west). Internally, the floor level will be at an RL elevation of 26.3 metres. Top-of-ceiling height will be at an RL elevation of 40.7 metres.

[Internally, the floor-ceiling height will be 14.25 metres].

The refrigerated warehouse is fully enclosed within a 150 mm thick box consisting of Kingspan PIR panels, supported from the outside by a structural steel portal frame.

[The Kingspan PIR panel consists of a closed cell core of polyisocyanurate (PIR) with a layer of sheet steel, both sides, protecting the internal insulating core material].

The refrigerated warehouse is ‘capped’ by a pitched ‘colorbond’ roof.

The roof ridgeline (with solar powered ventilators) will be at an RL elevation of 42.4 metres (about 1.7 metres above the insulation).

Around the edges, the roof is offset about 0.425 mm away from the insulation (horizontally & vertically). The roof then extends down another 5 metres below the top of the insulation as a skirt all around the building, opening from about 0.425 metres at the top to about 0.85 metres at the bottom.

The roof & skirt provide solar protection insulating panels.

The lower walls & the roof cladding will be heated by the sun. Conduction will heat the air immediately adjacent to the lower external walls & against the inside of the ‘colorbond’ roofing.

Air convection will carry this heat up the outside of the walls by thermal buoyancy, up into the external skirt (pressurising the roof cavity). Assisted by the extraction ventilators, this air will push the heated air within the pitched roof cavity, out through the ventilators.

### **Estimated Transmission Loss of the Proposed Insulated Warehouse**

Transmission Loss data has been obtained from Kingspan for a number of their panel types.

Although, the Kingspan PIR panel has not been tested, this data supplied enabled a sound transmission loss spectrum to be derived for the 150 mm thick PIR panel.

Sound Transmission Loss spectra were derived for

- 1) the PIR panel alone (lower walls),
- 2) the Kingspan PIR panel / roof cavity / ‘colorbond’ roof combination, and for
- 3) sound exiting via the gap between roof skirt & wall opening.

*The estimated acoustic performance for the Kingspan PIR panel is an **R<sub>w</sub>** rating of 27 dB with **C<sub>i</sub>** & **C<sub>tr</sub>** of minus 3 dB & minus 4 dB.*

*The estimated acoustic performance for the Kingspan PIR panel & ‘colorbond Roof combination is an **R<sub>w</sub>** rating of 44 dB with **C<sub>i</sub>** & **C<sub>tr</sub>** of minus 1 dB & minus 2 dB.*

*The estimated acoustic performance for the gap between the Kingspan PIR panel and the sheet metal cladding is an **R<sub>w</sub>** rating of 21 dB with **C<sub>i</sub>** & **C<sub>tr</sub>** of minus 3 dB & minus 4 dB..*

## **Noise Levels – Internal & External**

To obtain representative noise levels, acoustic measurements were obtained within the existing building at No. 24-27 Lambridge Place on Tuesday 24<sup>th</sup> October 2017.

Noise levels were measured using a 01dB-Stell “Symphonie” (Serial No. #01481) attached to a Acer Aspire 3681 WXM1 portable computer (model ZR1; Serial No. LXAP0506063604D772500). The microphone and pre-amp were a 01dB-Stell pre-amplifier (Serial No. 011280) and microphone (Serial No. 18528).

Calibration was checked with a Svantek SV 30A acoustical calibrator (Serial No. 7942). No significant system drift was observed.

Measurements were carried out within the ‘compressor room’, within the loading dock (with forklifts loading trucks), and within the existing refrigerated warehouse.

Within the compressor room, the general LAeq noise level was 83 dB(A). With additional compressors this is likely to rise to 86 dB(A). As I understand, this will house the additional compressors for the proposed refrigerated warehouse.

Within the loading dock, the general LAeq noise level was 75 dB(A). Immediately adjacent to the forklifts this rose to about 85 dB(A), indicating an acoustic ‘room radius’ of about 3 metres and a reverberation time of about 1 second.

Within the refrigerated warehouse, the general LAeq noise level was 65 dB(A) from the heat extractors high up on the walls and forklift movement within the space.

Measurements were carried out adjacent to the existing external heat exchangers.

The estimated Sound Power Level is an LAeq of 104 dB(A). These had a tonal component in the 160 HZ 1/3 octave centre-frequency band.

Measurements were also taken of a trailer refrigeration unit.

The measured sound pressure level was 73 dB(A) at 3 metres, or having an estimated LAeq sound power level of 91 dB(A).

All of these acoustic transmission loss performance spectra were calculated on a one-third octave band basis.

## **Predicted Noise Emissions**

All of acoustic transmission loss performance spectra and mechanical equipment noise emissions have been calculated on a one-third octave band basis.

Building emissions were calculated by dividing the building into component emission areas.

### **Predicted Emissions from the Proposed Refrigerated Warehouse Envelope**

The southern wall of the proposed refrigerated warehouse is 18.75 metres from the southern boundary shared with No. 21 Lambridge Place.

The sound pressure level at 18.75 metres was calculated to be an LAeq noise level of 27 dB(A).

The northern wall of the proposed refrigerated warehouse is 3.75 metres from the northern boundary and 23 metres from the nearest industrial building.

The sound pressure level at 3.75 metres was calculated to be an LAeq noise level of 34 dB(A) decreasing to 26 dB(A) at 23 metres.

The west wall of the proposed refrigerated warehouse is 40 metres from the western boundary, 65 metres from the glassworks admin building and 160 metres from the glassworks.

The calculated sound pressure levels were LAeq noise levels were 23 dB(A) at the boundary, 16 dB(A) to the glassworks admin building and 10 dB(A) to the glassworks.

*With LAeq noise levels of 34 dB(A) close to the building 27 dB(A) to the nearest potentially affected industrial & commercial neighbours, the noise emissions from the building envelope are far below the noise cap of 65 dB(A) to the nearest commercial premises.*

#### **Predicted Noise Emissions from the Proposed Additional Loading Dock**

The rear wall of No. 21 Lambridge Place backs onto the southern boundary. There are two building on No. 21 Lambridge Place with road way access between.

The industrial / commercial units in these two buildings front onto this central roadway access, with glazing & access doors (person & vehicle) facing into the central roadway access.

The highest sound pressure level would be to the blank side & rear facades of the nearest building with an LAeq noise level at the nearest corner of 45 dB(A) dropping to 42 dB(A) along the side.

The LAeq noise level to the nearest facade on the southern side of the central roadway would be an LAeq of 38 dB(A).

*Again with LAeq noise levels of 45 dB to 38 dB(A) at nearest potentially affected commercial neighbours, the noise emissions from the proposed loading dock building envelope are far below the noise cap of 65 dB(A) to the nearest commercial premises.*

#### **Predicted Noise Emissions from Existing Building plus Proposed Increase in Chiller Capacity**

I've assumed similar construction for the existing as the proposed building. The current internal LAeq inside the chiller room is 82.5 dB(A).

The increase in external surface refrigerated warehouse area has more than doubled and enclosed volume of the refrigerated warehousing will have nearly trebled.

I've assumed an increase of 5 dB(A) in the chiller room noise levels.

The sound pressure level at the boundary from the chiller room was calculated to be an LAeq noise level of 56 dB(A) decreasing to 43 dB(A) at 23 metres at the nearest neighbouring building.

The sound pressure level at the northern boundary from the loading docks and existing warehouse was calculated to be an LAeq noise level of 55 dB(A) decreasing to 40 dB(A) at 23 metres at the nearest neighbouring building.



The sound power level of the current external heat exchangers has been estimated to be an LAeq sound power levels of 104 dB(A).

The sound pressure level at the northern boundary from the loading docks and existing warehouse was calculated to be an LAeq noise level of 75 dB(A) above the boundary decreasing to 64 dB(A) at the nearest neighbouring building.

A Google search indicates that this nearest building is a scaffold hire service with admin area at the far end of the site.

*Even with the increased chiller capacity, the noise emissions from the existing building would be an LAeq of 45 dB(A) from the building and 64 dB(A) from the external heat exchangers.*

*The tonality of these heat exchanger fans would incur a 5 dB(A) penalty, but even so this would less than the noise cap of 70 dB(A) to the nearest industrial premises.*

*The overall noise level would be unchanged with no additional loss of amenity to this neighbour.*

### **Predicted Noise Emissions from the Proposed New Heat Exchangers - Southern Side**

The sound power level of the current external heat exchangers has been estimated to be an LAeq sound power levels of 104 dB(A).

It has been indicated that the new heat exchangers will be equal to or less than the existing heat exchangers on the far side of the building, and would be operating with slower speed fans.

With slower speed fans, the tone would be most likely drop in frequency removing any tonal component, and any tonality penalty.

The rear wall of No. 21 Lambridge Place backs onto the southern boundary. There are two building on No. 21 Lambridge Place with road way access between.

The industrial / commercial units in these two buildings front onto this central roadway access, with glazing & access doors (person & vehicle) facing into the central roadway access.

The highest sound pressure level would be to the blank side & rear facades of the nearest building with an LAeq noise level at the nearest corner of 66 dB(A) dropping to 64 dB(A) along the side.

These blank facades appear to be of concrete stand up panels with an Rw rating of 50 dB or more.

With parapet, the roof of this building is likely to be exposed (externally) to an LAeq noise level of 57 to 59 dB(A). This type of roof typically has an Rw rating of about 11 dB.

*Without knowing the internal dimensions of these industrial/commercial units, it is not [possible to calculate their internal noise levels. Any contribution via the concrete panelling would be far below any contribution via the roof.*

The LAeq noise level to the nearest facade on the southern side of the central roadway would be an LAeq of 62 dB(A).

The LAeq noise level to the nearest facade on the southern side of Lambridge Place (the sports centre) would be an LAeq of 63 dB(A).

*With LAeq roof top noise levels of about 58 dB(A) and facade LAeq noise levels of 62 to 63 dB(A), the noise emissions from the proposed loading dock heat exchangers would be below the noise cap of 65 dB(A) to the nearest commercial premises.*

### **Summary of Noise Emissions around the Site**

Noise emissions from the building envelope are predicted to be about 34 dB(A) to the northern boundary, about 27 dB(A) to the southern boundary and about 23 dB(A) to the western boundary.

Noise emissions from the proposed loading dock are predicted to be about 42 to 45 dB(A) to the nearest buildings on the southern side.

The noise emissions due to increasing the capacity of the chillers are predicted to be about 56 dB(A) to the northern boundary and 43 dB(A) to the nearest building on the northern side. The noise emissions from the existing heat exchangers (north-west corner) would remain the same at about 65 dB(A) to the nearest industrial neighbour to the north.

The heat exchangers to be located on the roof of the proposed southern loading dock will impact No. 21 Lambridge Place.

The highest LAeq noise level would be to the blank side & rear facades of the nearest building with an LAeq noise level at the nearest corner of 67 dB(A) dropping to 65 dB(A) along the side from the heat exchangers.

The LAeq noise level across the nearest roof tops are likely to about 59 dB(A).

The highest LAeq noise level would be to the 62 to 63 dB(A) to buildings further away.

### **Noise Emissions - External**

The noise emissions of the site include internal noise sources that emit via the building envelope), external noise sources (the external heat exchangers), and mobile equipment.

The existing building has five (5) loading bays in the western side of the existing building. This will be supplemented by two (2) loading bays adjacent to the proposed refrigerated warehouse.

According to Vehicle Standard (Australian Design Rule 28/01 - External Noise of Motor Vehicles) 2006, the trucks should not exceed an L<sub>max</sub> noise levels of 84 dB(A) at 7.5 metres.

A slow moving truck & trailer should have a Single Event Level (or SEL) sound power level of 113 dB(A) or less. The SEL is an engineering construct for calculating LAeq noise levels.

The refrigeration units on the trailers would have an L<sub>max</sub> of about 70 dB(A) at 7.5 metres.

During loading/unloading in the new loading bays, the noise levels along the blank western side of the nearest building at No. 21 Lambridge Place will be up to 57 to 60 dB(A), and about 53 dB(A) to the facade of the building on the southern side of No. 21 Lambridge Place, and to the southern side of Lambridge Place (from the refrigerated trailers).

Assuming one (1) truck in a 15-minute period, a trucks & refrigerated trailer moving down the side of the site, refuelling and departing would expose the rear blank wall of No. 21 Lambridge Place to an LAeq,15min of about 75 dB(A).

The rear blank wall of No. 21 Lambridge Place has an R<sub>w</sub> of about 50 dB and has a height of about 7 to 8 metres. Truck engine height is about 2 metres. The roof top LAeq,15min of less than 50 dB(A), (with a roof top R<sub>w</sub> of about 11 dB reducing this internally to less than 40 dB(A).

The combination of heat exchanger noise emissions and one (1) truck in a 15-minute period, the combination would still be less than 65 dB(A).

Truck movement in Lambridge Place (when coming from or exiting to Andrews Road) should produce LAeq,15min noise levels of about 58 dB(A) to buildings along the length of Lambridge Place.

## **Operating Times**

As I understand, the current operating hours are from 4:00 am to midnight. I can see no reason why this should not be extended to 24 hour operation.

The industrial / commercial noise limits only apply when the receiver location is operating.

## **Conclusions**

The site is currently impacted by nearby industrial noise (close but emission sources are high & directional), local commercial traffic, and more distant traffic noise.

The nearest potentially impacted residential areas are to the north behind tall noise barriers, and to the east at about 900 metres to 1,000 metres with intervening buildings.

The increased chiller capacity (in the north-west corner of the existing building) will not increase noise levels in that direction.

The proposed expansion will include a refrigerated warehouse capacity (interconnected with the existing refrigerated warehouse), increase chiller capacity to service the additional refrigerated warehousing, increase loading dock capacity, and add more heat exchangers.

The increased chiller capacity (in the north-west corner of the existing building) will not increase noise levels in that direction.

The proposed expansion of the refrigerated warehouse capacity will produce component sound levels of 34 dB(A) or less along the boundaries.

The additional loading bays on the southern side will only impact the southern side of the site with levels of 42 dB(A) to the blank rear wall of the nearest affected building and 38 dB(A) to the front facade of the next nearest building.

The proposed additional heat exchangers will only impact the southern side of the site.

Provided that the sound power level of these units are equal to or less than the existing heat exchangers on the far side of the existing building, and provided that the units are non-tonal (according to EPA assessment procedures), the predicted sound levels will be 66 dB(A) to the blank rear wall of the nearest affected building and 63 dB(A) to the front facade of the next nearest building.

The blank rear wall of the nearest affected building will act as a noise barrier for that building reducing the impacting sound even further.

*Additional work may be required on the assessment of the component contribution of these heat exchangers component as more detailed information becomes available. Further noise reduction can be achieved if required.*

Truck movement noise has also been assessed.

The noise level impacting on the blank rear wall of No. 21 Lambridge Place is likely to produce an LAeq,15min of about 75 dB(A) near the wall.

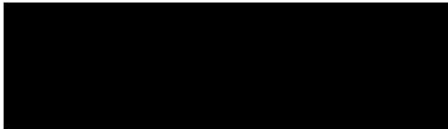
The blank rear wall of this nearest affected building will act as a noise barrier for that building reducing the impacting sound even further.

The rear wall of this building would have an Rw rating of about 50 dB. The barrier effect of this wall should reduce the roof top LAeq,15min noise levels to about 50 dB(A).

Truck movement along the length of Lambridge Place (when coming from or exiting to Andrews Road) should produce LAeq,15min noise levels of about 58 dB(A) to buildings along the length of Lambridge Place.

This would be little different from the noise of existing traffic on Lambridge Place.

Based upon the on-site measurement of operational noise levels, upon observation of on-site operations, and upon the predicted noise emissions, BGMA Pty Ltd is of the opinion that the proposed expansion of refrigerated warehousing capacity at Food Boss will not adversely impact on far distant residential areas, nor upon nearby commercial industrial premises, and will be within the noise limits indicated in the NSW Industrial Noise Policy.



Brian Marston MAAS  
Principal Acoustic Consultant  
BGMA Pty Ltd

#### **Professional Affiliations & Qualifications**

A practicing Acoustical Consultant		since 1981
Full member	<i>Institution of Engineers Australia (IEAust) &amp; CPEng</i>	since 1986
Full member	<i>Australian Acoustical Society (AAS)</i>	since 1988
Full Member	<i>Acoustical Society of America (ASA)</i>	since 2007

A member of the international professional body of acoustical consultants, the *National Council of Acoustical Consultants* since 1999