



MARSHALL DAY
Acoustics 

ALLIED ASPHALT
REPLACEMENT PLANT
ASSESSMENT OF NOISE EFFECTS
Rp 001 20210691 | 30 November 2022

Project: **ALLIED ASPHALT REPLACEMENT PLANT**

Prepared for: **Allied Asphalt Limited**
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Report No.: **Rp 001 20210691**

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EXECUTIVE SUMMARY

This report considers potential operational noise effects for the closest industrial and residential zoned receivers. We have calculated noise emissions from the proposed new Marini asphalt plant and compared the resulting levels to the relevant noise limits in the Tauranga City Plan. Minor non-compliances are calculated for industrial zoned receivers. Ready compliance is calculated for residential zone receivers.

We have calculated cumulative asphalt production noise, including loader and truck movement noise. The primary noise source is the asphalt plant. Secondary noise sources are the loader and trucks transporting raw materials and finished asphalt product.

Given the site is in an existing established industrial zone and considering the calculated noise levels and noise character, we are of the opinion that noise will remain reasonable, with no adverse amenity effects.

We have calculated construction noise levels for the Project. We have assumed typical construction techniques will be employed. We calculate short-term exceedances of the relevant limits. No adverse effects will occur given the industrial zone setting.

We have recommended a suite of noise conditions, should consent be granted.

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1.0 REPORT SUMMARY AND CONCLUSIONS

We have assessed noise from Allied Asphalt's replacement asphalt plant (the Project) as readily complying with the residential zone limits in the Tauranga City Plan (the TCP). The character of noise generated by the new asphalt plant will be similar to the existing plant. At the closest residential receivers the level of noise will be suitably low as to not cause any adverse effects.

Noise received in the adjacent industrial zoned properties is calculated to exceed the 65 dB L_{Aeq} limit by between 1 to 4dB. These are minor exceedances which will not cause adverse effects.

Allied Asphalt Limited has engaged Marshall Day Acoustics to carry out an assessment of noise effects for a proposed replacement asphalt plant. The replacement plant will be located at their existing Aerodrome Road site in Mt Maunganui (the Site).

Construction and operational vibration will be of no appreciable significance, therefore is excluded from this report.

We have modelled noise emissions from the proposed new Marini asphalt plant. Modelling is based on "Level 0" mitigation which has a calculated sound power level of 110 dB L_{WA} . No additional mitigation is proposed nor warranted in our opinion.

We calculate a noise level of up to 34 dB L_{Aeq} at the closest dwellings. This readily complies with the residential zone limits in all periods. Minor exceedances are calculated at the adjoining industrial zone boundaries. No adverse effects will occur in both cases.

We calculate that short-term exceedances of the construction noise standard could occur during the Project's construction. The exceedances will occur at adjacent industrial zoned sites. Irrespective of the non-compliances we are of the opinion that no adverse noise effects will occur.

The report includes recommended conditions of consent.

A Glossary of Terminology is provided in Appendix A.

2.0 PROJECT OVERVIEW AND NOISE GENERATING SPECIFICS

2.1 Project overview

Allied Asphalt proposes to construct and operate a new asphalt plant at their Mt Maunganui site located at 54 Aerodrome Road. Once the new plant is commissioned and in production, the old plant will be decommissioned and dismantled. The Project will also comprise various yard layout improvements including increased aggregate storage and a new vehicle route.

Notable features of the new asphalt plant include:

- Marini BE Top Tower 2500
- Improved production efficiency, lower emission of pollutants, lower noise emissions
- Dual fuel capability (natural gas and liquid fuel e.g. diesel, bio diesel, waste oil)

The new plant will have a greater throughput capacity however this is not the main driver for the upgrade. We understand that production volumes are expected to be similar to current therefore heavy vehicle movements will not materially change.

2.2 Project noise-generating specifics

The proposed Marini BE Top Tower 2500 asphalt plant will be supplied with 'Level 0' noise mitigation. That is, the plant will come from the factory fitted with standard noise attenuation on components. This results in a claimed total noise level of 59 dB L_{Aeq} at 100m. We have back-calculated a sound power level of 110 dB L_{WA} for the plant.

Heavy commercial vehicles (HCV) will enter and exit the site via Aerodrome Road, as currently occurs. However, the redesigned site will have designated entry and exit gates to improve vehicle flow and safety. Table 1 summarises the HCV trip generation¹ for average and peak daily output scenarios.

Table 1: HCV's per day

Daily Output	Raw Materials	Asphalt Trucks	Peak Hour	Daily Total (24hrs)
250 tonnes	7	25	12	32
1,000 tonnes	28	80	14	108

Notes to table:

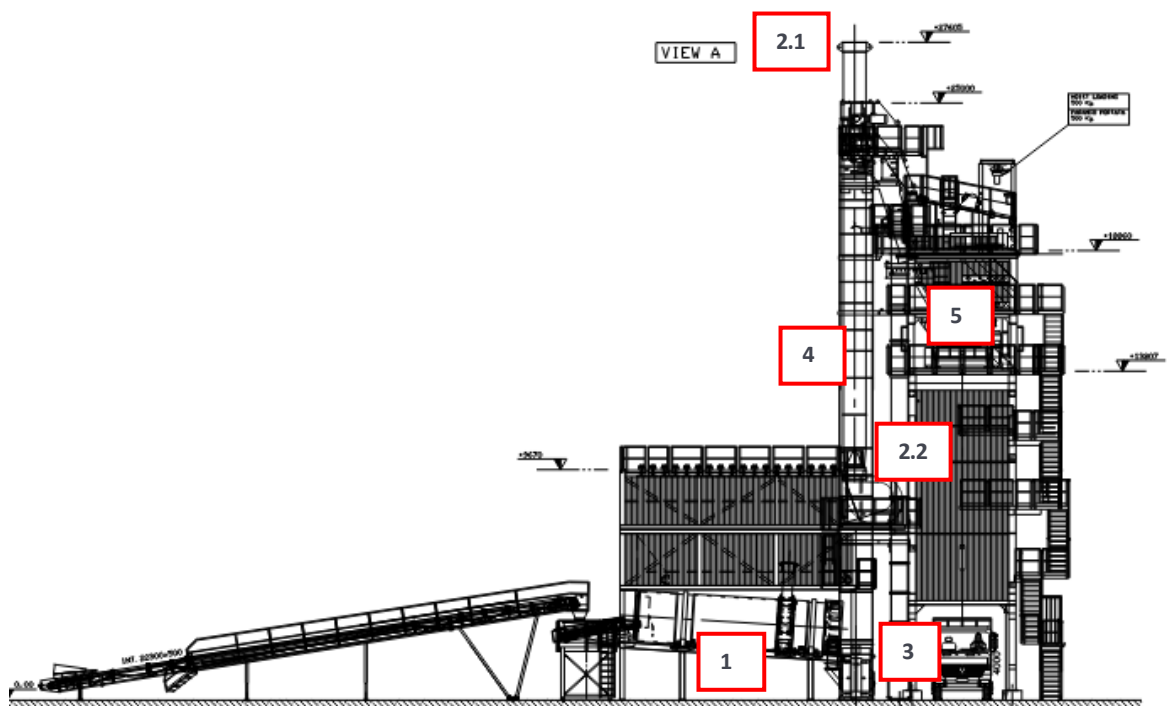
- (1) Excludes light vehicle movements. This vehicle class is typically more than 10 dB quieter than HCVs therefore will not significantly affect site noise emission

The proposed Marini plant, like other asphalt plants, is typically comprised of a number of common components which generate noise. The primary noise emitting components identified are:

- Dryer (1)
- Exhaust stack (2.1) / motor-fan (2.2)
- Burner (3)
- Hot elevator (4), and
- Mixing tower (5)

Figure 1 identifies the location of these components.

Figure 1: Asphalt plant main components



The asphalt plant will incorporate acoustic mitigation into its design, appreciably reducing noise emission compared to the existing plant.

¹ CKL Integrated Transportation Assessment

New electrical infrastructure in the form of cabling and a transformer will be installed and connected to the asphalt plant to supply electricity to the new equipment.

3.0 NOISE PERFORMANCE STANDARDS AND RELEVANT LEGISLATION

The Site is located in an established Industrial zone. Site noise must comply with 65 dB L_{Aeq} any time of the day. In addition site noise must comply with 85 dB L_{AFmax} at night within the boundary of any other activity in the same zone. A residential zone is situated a considerable distance to the north-east of Aerodrome Road. Ready compliance will be achieved with the relevant residential zone limits at all times.

The TCP requires construction noise to comply with the limits contained in NZS 6803:1999.

3.1 Tauranga City Plan

3.1.1 Operational noise

Rule 4E.2.3(b) sets a limit of 65 dB L_{Aeq} for noise received at any point within the boundary of any other site within the *Industrial Zone*. A maximum noise limit of 85 dB L_{AFmax} at night-time also applies between 2200 and 0700hrs.

Rule 4E.2.3(a) sets the following noise limits for noise received within the boundary of any site within a *Residential Zone*:

Time of Day	Noise Level Measured in dB L _{Aeq}	Noise Level Measured in dB L _{AFmax}
0700 - 2200 hours	55	-
2200 – 0700 hours	45	70

Rule 4E.2.3(h) states that sound levels shall be measured in accordance with NZS 6801:2008 *Acoustics – Measurement of Sound* and assessed in accordance with NZS 6802:2008 *Acoustics – Environmental Noise*, or any superseding codes of practice and/or standards.

We note that the 2008 versions of NZS 6801 and NZS 6802 are currently the most up-to-date versions of these standards and are used in our assessment.

3.1.2 Construction noise

Rule 4E.2.14(a) states that construction noise from a site in any zone within Tauranga City shall not exceed the limits recommended in, and shall be measured and assessed in accordance with, NZS 6803:1999 *Acoustics - Construction Noise*.

Refer to Appendix C for the full table of limits as they appear in NZS 6803:1999. In summary, the relevant “long-term” duration limits for typical construction hours of 0730hrs to 1800hrs Monday to Saturday are 70 dB L_{Aeq} / 85 dB L_{AFmax}.

3.2 Resource Management Act 1991 (RMA)

Under the RMA, there is a duty to adopt the best practicable option to ensure that noise (including vibration) does not exceed a reasonable level. Specifically, Sections 16 and 17 state the following:

Section 16 states that “every occupier of land (including any premises and any coastal marine area), and every person carrying out an activity in, on, or under a water body or the coastal marine area, shall adopt the best practicable option to ensure that the emission of noise from that land or water does not exceed a reasonable level”.

Section 17(1) states that “every person has a duty to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity carried on by or on behalf of the person, whether or not the activity is in accordance with –

- (a) Any of sections 10, 10A, 10B and 20A; or
 (b) A national environmental standard, a rule, a resource consent, or a designation”

This report uses the guiding principles of Section 16 and 17 of the RMA as noted above in assessing effects and recommending mitigation measures.

4.0 OPERATIONAL NOISE ASSESSMENT

Our assessment confirms that operational noise from the Project will comply with the relevant TCP limits at Residential Zone locations. We calculate technical non-compliances at adjacent industrial properties. No adverse effects will result from these exceedances.

The character of noise generated by the new asphalt plant will be similar to the existing asphalt plant. Further afield at the closest residential receivers, the level of noise will be suitably low as to not cause any adverse effects.

4.1 Operational noise calculations

Table 2 presents the calculated noise levels for 250T asphalt production per day. The results confirm that the new plant will comply with the relevant limits at all times.

Technical non-compliances are calculated at adjacent industrial properties for 1,000T production per day (refer to Table 3 overleaf). However, no adverse effects will occur given the low sensitivity to noise inherent within the Industrial Zone.

Table 2: Calculated cumulative sound levels (250T production per day)

Rec. No.	Address	Noise Limits	Noise Anytime	Noise Night-time	Complies?
		[Anytime / Night-time] ³	(dB L _{Aeq})	(dB L _{AFmax})	
<u>Industrial receivers:</u>					
R1	14 Harvard Way	65 / 85	62	69	Yes
R2	67 Hewletts Road	65 / 85	60	66	Yes
R3	44 Aerodrome Road	65 / 85	59	64	Yes
R4	60 Aerodrome Road	65 / 85	61	65	Yes
R5	47-55 Aerodrome Road (odd numbers)	65 / 85	53	59	Yes
<u>Residential zone:</u>					
R6	Maunganui Road	55 / 45 & 70 ²	29	34	Yes

Notes to table:

- (1) Appendix A provides an explanation of technical terms
- (2) Residential zone daytime limit is 55 dB L_{Aeq}; night-time limits are 45 dB L_{Aeq} and 70 dB L_{AFmax}
- (3) Industrial zone limit of 65 dB L_{Aeq} applies any time of day; an extra limit of 85 dB L_{AFmax} applies at night

Table 3: Calculated cumulative sound levels (1,000T production per day)

Rec. No.	Address	Noise Limits	Noise Anytime	Noise Night-time	Complies?
		[Anytime / Night]	(dB LAeq)	(dB LAfmax)	
<u>Industrial receivers:</u>					
R1	14 Harvard Way	65 / 85	69	69	No
R2	67 Hewletts Road	65 / 85	66	66	No
R3	44 Aerodrome Road	65 / 85	66	64	No
R4	60 Aerodrome Road	65 / 85	67	65	No
R5	47-55 Aerodrome Road (odd numbers)	65 / 85	60	59	Yes
<u>Residential zone:</u>					
R6	Maunganui Road	55 / 45 & 70	35	34	Yes

Refer to Appendix E for the calculated noise contour for the 1,000T per day scenario.

4.2 Assessment of noise effects

We are of the opinion that the noise experienced by all receivers will be reasonable in the context of section 16 of the RMA for the following reasons:

- Given that the new asphalt plant will operate in an established industrial zone;
- Considering the new plant's noise levels will be similar or less than the existing plant; and
- The noise character generated by the new plant will be similar to the existing plant's character

We therefore conclude that there will be no adverse noise amenity effects.

4.3 Operational noise calculation methodology

We have calculated operational sound levels in accordance with ISO 9613-2: 1996² using SoundPLAN® environmental noise modelling software. ISO 9613 considers a range of frequency dependent attenuation factors including atmospheric absorption, ground and barrier effects, directivity, as well as spherical spreading.

The ISO 9613-2 Standard adopts the conservative approach of assuming that wind is always blowing from the noise source towards the receiver. The calculations also hold for average propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs on clear, calm nights.

The noise sources modelled in each scenario are:

- The new asphalt plant operating;
- Frontend loader loading aggregate continuously into the cold feed system; and
- Asphalt delivery truck movements around site as per Table 1.

² ISO 9613-2: 1996 "Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation"

The 250T scenario represents about five hours of continuous production. The 1,000T scenario represents nearly a full 24-hours of continuous production. Our modelling takes this into account.

Our modelling uses the sound power levels listed in Appendix D and includes operational noise from trucks and front-end loader movements.

4.4 Identified receivers

There are a number of receivers that will receive noise from the new asphalt plant. We note that the surrounding industrial-zoned receivers will already experience noise from the existing plant's operation as well as a variety of other industrial activities.

The identified receivers represent:

- Adjoining industrial-zoned properties. The TCP stipulates that operational noise from the site must comply with the relevant limits “...within the boundary of any other site in the...Industrial Zone...”, and
- The closest dwelling to the site (Maunganui Road – approximately 585m eastwards). If compliance is shown here, then it can be inferred with a high degree of confidence for all other residential receivers not included in the assessment

Table 4 lists the identified receivers, zoning / primary use and distance to the new asphalt plant.

Table 4: Receiver table

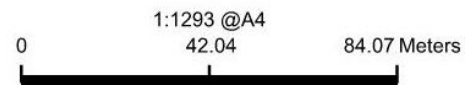
Pos. No.	Address/location	Zoning / Usage	Location Relative to Asphalt Plant
R1	14 Harvard Way	IND / Manufacturing	Adj. western boundary
R2	67 Hewletts Road	IND / Tyre retailer	Adj. northern boundary
R3	44 Aerodrome Road	IND / Manufacturing	Adj. northern boundary
R4	60 Aerodrome Road	IND / Manufacturing	Adj. southern boundary
R5	47-55 Aerodrome Road (odd numbers)	IND / Manufacturing	Eastern side of Aerodrome Road
R6	Maunganui Road	RES / Dwellings	~585m to east of site

Figure 2 overleaf shows the location of the identified closest receivers.

Figure 2: Identified closest receivers



Allied Asphalt Site



Information shown on this plan is indicative only. The Council accepts no liability for its accuracy and it is your responsibility to ensure that the data contained herein is appropriate and applicable to the end use intended.



5.0 CONSTRUCTION NOISE ASSESSMENT

We calculate that short-term exceedances of the construction noise standard could occur during the Project's construction. The exceedances will occur at adjacent industrial zoned sites. Irrespective of the non-compliances we are of the opinion that no adverse noise effects will occur.

5.1 Calculated construction noise levels

We anticipate the plant and activities listed in Table 5 will be used during construction of the new asphalt plant. The table includes the per unit sound power level and the minimum distance required to comply with the 'long-term' duration limit of 70 dB L_{Aeq} (refer to Section 3.1.2).

Table 5: Calculated construction noise levels (without temporary screening)

Activity	Equipment	Sound Power (dB L _{WA})	Screening	Façade Noise Level (dB L _{Aeq}) ^{1,2}			Limit Setback (m)
				20m	50m	100m	70dB L _{Aeq}
Site enabling works	20T excavator	103	-	72	63	55	25
	Truck and trailer	105	-	74	65	57	30
Piling / foundations	Excavator mounted piling rig	111	-	82	73	65	63
	Concrete pump	106	-	80	71	63	52
	20T Excavator	103	-	75	66	58	33
	Truck	105	-	72	63	55	25
Structural and fitout	30T mobile crane	98	-	74	65	57	30
	Grinder (hand tools)	108	-	67	58	50	14
	Compressor	93	-	77	68	60	40
	Generator (150kVA)	93	-	62	53	45	8
Site landscaping and access roads	7T excavator	102	-	62	53	45	8
	20T excavator	103	-	71	62	54	22
	3-axle dump trucks	106	-	72	63	55	25
	7t vibratory roller	102	-	75	66	58	33
	Bitumen truck	103	-	71	62	54	22

Notes to table:

- (1) Appendix A provides an explanation of technical terms
- (2) In accordance with the requirements of NZS 6803: 1999 (Section C.2) inclusive of 3 decibels facade reflection

5.2 Construction noise calculation methodology

The contractor will develop a detailed construction programme prior to the commencement of construction activities. This will form part of the Construction Management Plan. We have assumed an indicative construction methodology for our calculations in its absence.

We have assumed that typical construction techniques will be employed on this project. Initial earthworks will be required, followed by ground improvement measures around building

foundations. Following this, cranes will be used to install heavy items. A large component of the works will be electrical and mechanical fitout.

Construction noise has been calculated in general accordance with the method detailed in Annex D³ of NZS 6803:1999. The method considers the sound power level, periods of operation, distance from source to receiver and screening of each source, as well as façade reflection and the degree of soft ground attenuation.

6.0 RECOMMENDED CONDITIONS OF CONSENT

We recommend the following noise conditions, should consent be granted:

1. The consent holder shall ensure that operational noise must comply with Rule 4E.2.3(b) of the Tauranga City Plan when measured at the site boundary of any other industrial activity in the same zone, except at the following adjacent sites where the following limits will apply.

Address	Daytime and Night-time Noise (dB L _{Aeq})	Night-time Noise (dB L _{AFmax})
14 Harvard Way	69	85
67 Hewletts Road	66	85
44 Aerodrome Road	66	85
60 Aerodrome Road	67	85

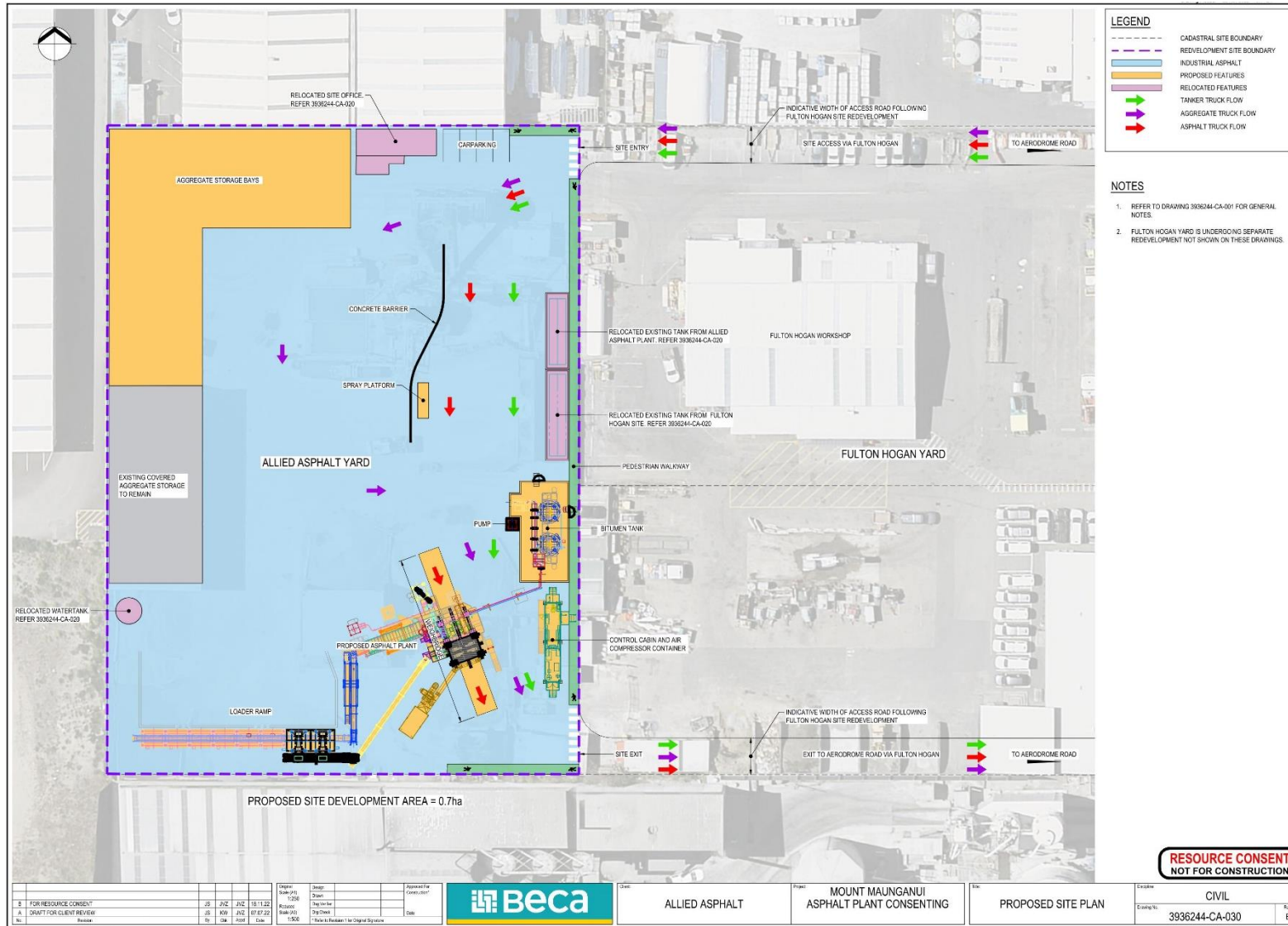
2. Operational noise from the consented activity shall be measured in accordance with Rule 4E.2.3(h) of the Tauranga City Plan which stipulates that noise levels shall be measured in accordance with NZS 6801:2008 Acoustics – Measurement of Sound and assessed in accordance with NZS 6802:2008 Acoustics – Environmental Noise, or any superseding codes of practice and/or standards.

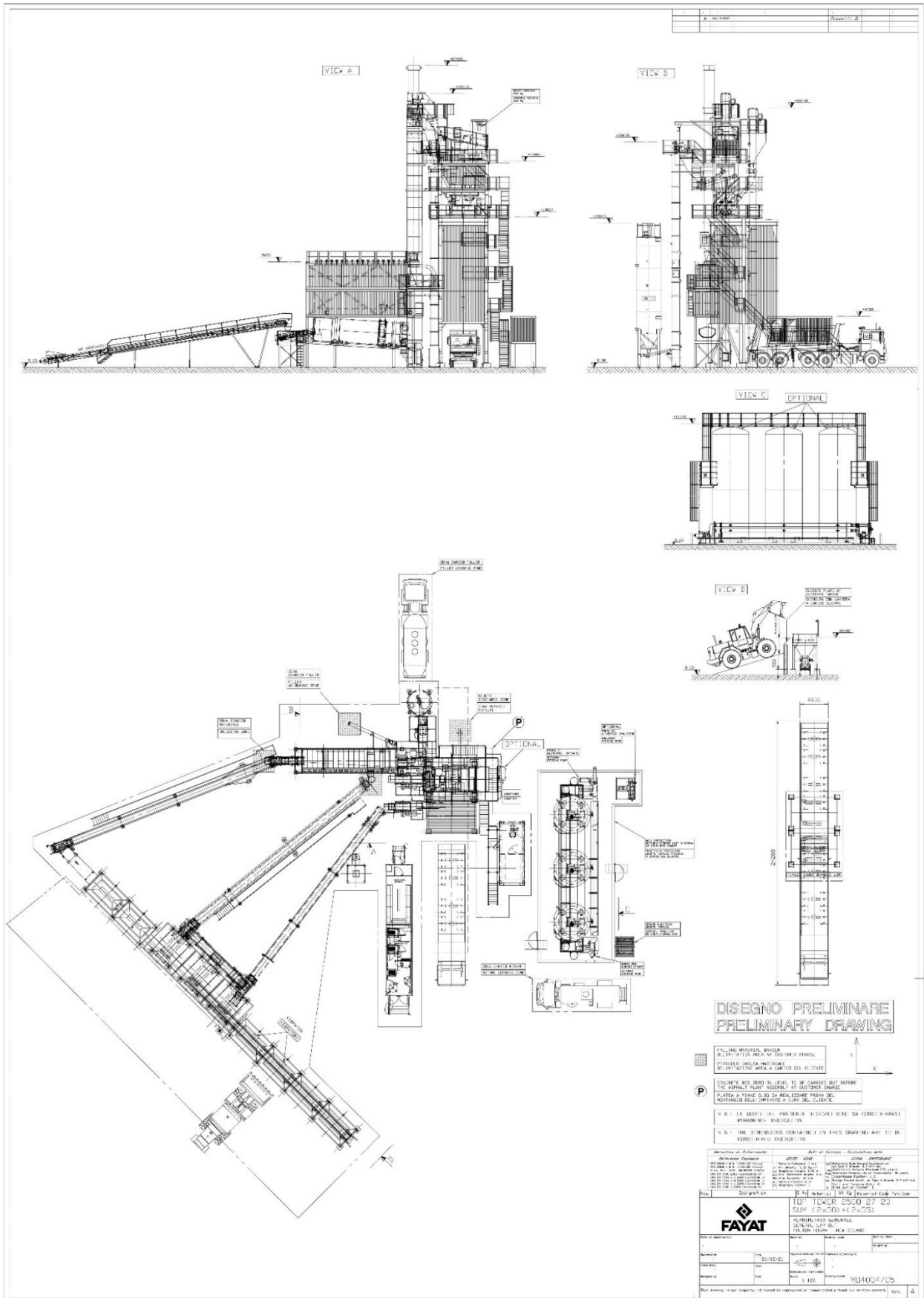
³ Annex D refers to BS5228-1: 1997 (now superseded by BS 5228-1:2009)

APPENDIX B GLOSSARY OF TERMINOLOGY

A-weighting	The process by which noise levels are corrected to account for the non-linear frequency response of the human ear. All noise levels are quoted relative to a sound pressure of 2×10^{-5} Pa
dB	Decibel. The unit of sound level. Expressed as a logarithmic ratio of sound pressure P relative to a reference pressure of $P_r = 20 \mu\text{Pa}$ i.e. $\text{dB} = 20 \times \log(P/P_r)$
dB(A)	The unit of sound level, which has its frequency characteristics modified by a filter (A-weighted) to approximate the frequency bias of the human ear.
$L_{Aeq}(t)$	The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level. The suffix "t" represents the period to which the noise level relates, e.g. (8 h) will represent a period of 8 hours, (15 min) will represent a period of 15 minutes and (2200-0700) will represent a measurement time between 10 pm and 7 am.
L_{Amax}	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
NZS 6801:2008	New Zealand Standard NZS 6801:2008 "Acoustics – Measurement of environmental sound"
NZS 6802:2008	New Zealand Standard NZS 6802:2008 "Acoustics - Environmental Noise"
SWL or L_w	<u>Sound Power Level</u> A logarithmic ratio of the acoustic power output of a source relative to 10^{-12} watts and expressed in decibels. Sound power level is calculated from measured sound pressure levels and represents the level of total sound power radiated by a sound source.

APPENDIX C SITE LAYOUT AND NEW ASPHALT PLANT DIMENSIONED ELEVATIONS





APPENDIX D CONSTRUCTION NOISE LIMITS

Table 2 – Recommended upper limits for construction noise received in residential zones and dwellings in rural areas

Time of week	Time period	Duration of work					
		Typical duration (dBA)		Short-term duration (dBA)		Long-term duration (dBA)	
		L _{eq}	L _{max}	L _{eq}	L _{max}	L _{eq}	L _{max}
Weekdays	0630-0730	60	75	65	75	55	75
	0730-1800	75	90	80	95	70	85
	1800-2000	70	85	75	90	65	80
	2000-0630	45	75	45	75	45	75
Saturdays	0630-0730	45	75	45	75	45	75
	0730-1800	75	90	80	95	70	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75
Sundays and public holidays	0630-0730	45	75	45	75	45	75
	0730-1800	55	85	55	85	55	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75

Table 3 – Recommended upper limits for construction noise received in industrial or commercial areas for all days of the year

Time period	Duration of work		
	Typical duration	Short-term duration	Long-term duration
	Leq (dBA)	Leq (dBA)	Leq (dBA)
0730-1800	75	80	70
1800-0730	80	85	75

APPENDIX E NOISE SOURCE SOUND POWER LEVELS

Source	Octave Band Centre Frequency (Hz)							dBA
	63	125	250	500	1000	2000	4000	
Asphalt Plant (Level 0 mitigation)	120	119	113	105	102	100	120	110
Truck and Trailer	101	106	100	99	100	99	94	105
Front End Loader	115	109	105	103	103	99	95	107
Truck idling	93	98	92	91	92	91	86	97

APPENDIX F NOISE CONTOUR CALCULATION (1,000T PER DAY SCENARIO)



<p>LEGEND</p> <ul style="list-style-type: none"> Point Source Modelled Buildings Truck or Loader Source Cadastral Boundaries Wall 	<p>Version: SoundPLAN 8.2 Prediction method: ISO 9612-3:199 Model number: SP 001 Run No & Title: 11/GNM S3 Peak Day UNMITI File: S3 1000 TPD UNMITIGATED Prediction Height: 2 m</p>	<p>Project: Allied Asphalt Mt Maunganui Asphalt Project number: 20210691 Client name: Allied Asphalt</p> <p>SCALE 0 20 40 80 120 160 m</p> <p style="text-align: center;">↑ N</p>	<p>ASPHALT PRODUCTION NOISE 1000T production per day unmitigated</p> <p>MARSHALL DAY Acoustics</p>
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