

NOISE ASSESSMENT

PROPOSED GYPSY AND TRAVELLER CARAVAN SITE ON LAND OFF NEW ROAD (A259), RUSTINGTON

MR T CASTLE

OCTOBER 2018

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Status	Prepared By	Date
1.0	L Jephson BEng (Hons) MIOA	17/10/18

This report has been prepared using all reasonable skill and care within the resources and brief agreed with the client. LF Acoustics Ltd accept no responsibility for matters outside the terms of the brief or for use of this report, wholly or in part, by third parties.

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1. Introduction

LF Acoustics Ltd have been appointed by Mr T Castle to carry out a noise assessment in support of a planning application for a proposed gypsy and traveller caravan site on land off New Road, Rustington, to allow the siting of a mobile home, caravan and construction of a day room.

A planning application has been submitted for the proposed development (Application Ref. A/9/18/PL). Environmental Health Officers consulted on the application, requested an assessment of the noise environment within the two homes to be undertaken, to ensure an acceptable level of noise would be achieved.

This report presents an assessment of the noise levels within the proposed mobile home and touring caravan for which planning permission is being sought for their siting, to ensure that the requirements of both BS 8233 and the National Planning Policy Framework (NPPF) are achieved.

The following section of this report provides a brief description of the Standards and guidance applicable to this development. Section 3 provides a description of the site and layout proposed within the planning application. Section 4 provides details of consultation with local authority officers to determine the requirement for this assessment. Section 5 presents the results of calculations to determine the noise levels within the proposed homes and assesses the calculated noise levels against relevant standards and guidance. Finally, Section 6 provides a summary of the report and recommendations.

2. Applicable Standards and Guidance

2.1. A description of the noise units referred to in this report is provided in Appendix A.

2.2. National Planning Policy Framework

The National Planning Policy Framework (NPPF), revised in July 2018 [1], sets out the Government's planning policies for England and how these should be applied. It provides a framework upon which locally-prepared plans for housing and other development can be produced.

The purpose of the planning system is to contribute to the achievement of sustainable development and at the heart of the Framework is a presumption in favour of sustainable development.

With regards noise, local planning policies and decisions should contribute to and enhance the natural and local environment by:

- preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels noise pollution.
- *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development (including cumulative effects) – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

The planning policy for travellers' sites was updated in August 2015 [2]. With regards to noise, this guidance advises local planning authorities that *local policies should provide for proper consideration of the effect of local environmental quality (such as noise and air quality) on the health and well-being of any travellers that may locate there or on others as a result of new development.*

This guidance is aimed at sites being developed specifically by local authorities to meet their requirements for residential pitches. In this case, the land is owned by the proposed occupier, who has no alternative site available to him.

2.3. British Standard BS 8233

BS 8233 [3] recommends design aims for noise levels to be achieved in new buildings and is the most appropriate guidance in defining applicable noise levels within the proposed development. The Standard was updated in 2014 to better reflect the requirements of the NPPF in terms of impact classifications and achieving the recommended guidance values, seeks to ensure that the occupants would not be subject to any significant adverse impacts, to ensure compliance with the requirements of the NPPF.

For residential properties, the guidance recommends the following design aims for the daytime (07:00 – 23:00) and night-time (23:00 – 07:00) periods:

- 35 dB $L_{Aeq,T}$ within living rooms and bedrooms during the daytime period;
- 40 dB $L_{Aeq,T}$ within dining areas / rooms during the daytime period;
- 30 dB $L_{Aeq,T}$ within bedrooms at night; and
- 50 – 55 dB $L_{Aeq,T}$ within gardens and open spaces during the daytime.

Where development is considered necessary or desirable, the Standard advises that the internal target levels specified previously may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

With regards outdoor spaces, it is recognised in the Standard that these guideline values may not be achievable in all circumstances, such as locations adjacent to main road networks. In areas where development might be desirable, such as the convenience of living next to the strategic highway network, in such situations the development should be designed to achieve the lowest practicable levels, but should not be prohibited. In these areas a compromise between elevated noise level and location, should be made, ensuring that the design seeks to achieve the lowest practicable levels in external spaces, but should not be prohibited.

3. Site Description and Development Proposals

The location of the site is indicated on Figure 1.

There are two families residing on the site at present.

Tony Castle and his family will reside in the mobile home, to be located adjacent to the A259, with Tony's brother Billy and his family residing in a touring caravan to the rear of the plot.

The mobile home will be a residential specification, complying with the requirements of BS 3632:2015.

The touring caravan used by Billy and his family is a 2016 Fendt Mayfair 700. This is a modern and well insulated caravan, fitted with double glazing and capable of being used all year around.

A day room would also be constructed on the site. The proposed layout for this room is that there would be no windows in the façade facing onto the road, with the main seating area located at the rear, furthest from the road. The day room would be of standard brick construction and fitted with thermal double glazing.

Noise levels within the application site are principally influenced by road traffic along the A259, which passes to the south, with the closest carriageway approximately 10 metres from the location of the mobile home.

To mitigate noise levels from the road traffic, it is proposed to construct a 1.8 metre high acoustic fence alongside the road boundary, with returns at either end of the site, as indicated on Figure 1. The proposed specification of the barrier is indicated on Figure 2. To ensure sound transmission through the barrier is negligible compared to the sound diffracted around the ends and top, the barrier would be of double skinned construction, as indicated on the Figure and would provide a minimum of 20 dB sound reduction through the panel.

4. Consultation with Local Authority Officers

Officers at Arun District Council were consulted on the requirements of the noise assessment during October 2018. A copy of the consultation response is provided in Appendix B.

The officer consulted was hopeful that a desk based assessment would be sufficient for their requirements and this report has been prepared on this basis and based upon calculations and an assessment of the noise levels within the two homes.

5. Calculation and Assessment of Noise Levels

5.1. Specification for Mobile Home and Touring Caravan

As indicated previously, both homes would be used for the two families to reside in.

The main mobile home, to be sited adjacent to the A259 would comply with the residential specification requirements for mobile homes, as defined in BS 3632:2015 [4]. The Standard provides a minimum specification for the design of residential mobile homes, taking consideration of areas including insulation, internal design and ventilation requirements.

This standard seeks to ensure that the mobile homes used for residential purposes are designed to achieve a minimum sound insulation for the external walls and roof of 35 dB R_w . Whilst there is no specific acoustic performance for the glazing, there is a requirement to ensure an adequate thermal performance, which requires the provision of thermal double glazing, typical of most residential dwellings (4-16-4 glazing typically provides a sound reduction of 32 dB R_w).

Measurements obtained within a mobile home previously similar to the one proposed, indicated an overall level difference of 32 dB between outside and in, with windows closed and the window vents fully open, which is equivalent to the sound reduction specified within BS 3632, taking account of the glazing and vents. The 1/3 octave band reductions are indicated on Figure 3. These reductions have been assumed reasonable for the purposes of the present assessment.

There are no specific requirements for the construction of touring caravans. However, the caravan that is being used is a modern touring caravan, fully double glazed and well insulated, allowing use throughout the year. We have previously taken measurement inside and outside a similar Fendt caravan, located adjacent to the main road network, to evaluate the level difference. The measured level differences are presented on Figure 3 and indicate a typical level reduction 5 dB(A) lower than associated with the residential specified mobile home.

5.2. Calculation of External Noise Levels

To evaluate the noise levels attributable to the road traffic flowing along the A257, calculations of the noise levels have been made utilising the methodology from CRTN [5] and correcting for period day and night-time $L_{Aeq,T}$ noise levels utilising the TRL methodology [6].

Traffic flows for this short section of the A259 have been obtained from traffic counts undertaken in 2017, which indicated the following two way Average Daily Weekday Flows:

- 29056 total flow; and
- 405 LGV / HGV (>3.5 tonnes).

To convert to an equivalent day and night-time flow, it has been assumed that 95% of the traffic would pass during the daytime period (07:00 – 23:00) and 5% over night (23:00 – 07:00), resulting in the following day and night-time one way flows:

- 13056 total flow in each direction daytime (07:00 – 23:00);
- 1450 total flow in each direction night-time (23:00 – 07:00); and
- 13.8% LGV / HGV.

Given the short section of road between the two roundabouts at either end of the A259 bypass, it has been assumed that the traffic speeds would be typically 60 mph (and likely to be lower during peak periods). This speed limit has therefore been assumed for the current assessment.

Noise levels within the application site have been calculated using the SoundPlan computer modelling package, which implements the calculation procedures described above.

The modelling has taken account of the traffic flows, speeds, location of the proposed homes and proposed boundary mitigation.

To provide some validation of the model, reference has been made to a noise monitoring exercise carried out previously for a development at The Poplars to the west of the site (Application Ref LU/266/16/DOC). Calculations have been made at a position representative of the monitoring location used for that exercise, which indicate a good agreement between the measured and calculated noise levels for the daytime period, although indicated that the calculations were over estimating the noise levels at night. On this basis, the modelling assumptions are considered to have provided a worst case situation.

Calculations have been made at the facades of the two homes and day room on the basis of the provision of no boundary mitigation, to provide a base case, with the proposed 1.8 metre high barrier installed, the application case, and considering higher mitigation of 2.1 metres in height to ascertain whether there would be any further benefit in modifying the mitigation to that presently proposed.

The results of the calculations are presented on Figures 4 – 6.

It is clear from the results, that the provision of the acoustic fence would provide a noticeable reduction in noise levels within the site, with the barrier providing up to 7 dB(A) reduction in noise levels at the facades of the mobile home. This would therefore provide a significant reduction in noise levels and provide a clear benefit.

Calculation of Internal Noise Levels

Noise levels within the homes have been evaluated from the calculated road traffic noise levels utilising 1/3 octave band noise spectra obtained from previous survey taken at a similar level and scaling to the equivalent day and night-time levels. The external / internal levels differences presented on Figure 3 have been subtracted from the 1/3 octave band external noise levels to determine the noise levels within the two mobile homes. Details of the calculations are provided in Appendix C, which indicate the following internal levels:

- Mobile Home - 34 dB $L_{Aeq, 16 \text{ hour}}$ daytime and 28 dB $L_{Aeq, 8 \text{ hour}}$ night-time; and
- Touring Caravan - 39 dB $L_{Aeq, 16 \text{ hour}}$ daytime and 33 dB $L_{Aeq, 8 \text{ hour}}$ night-time.

Calculations of the internal noise levels have additionally been prepared for the day room, based upon the construction specification proposed and utilising the methodology from BS 8233. The calculations, presented in Appendix C, indicate an internal noise level of 34 dB $L_{Aeq, 16 \text{ hour}}$ during the daytime periods when the room would be most likely to be used.

5.3. Assessment of Noise Levels

Assessing the noise levels within the mobile home against the requirements of BS 8233, indicates that the internal noise environment within the home would meet the requirements of the Standard both during the day and night-time periods and would seek to ensure a good standard of noise was maintained internally, thus compliant with the requirements of the NPPF.

Noise levels within the touring caravan would be higher, as the acoustic performance of this type of home is lower. An assessment of the calculated internal noise levels indicates that the internal levels would not achieve the recommended design aims within BS 8233 during the day or night-time periods. However, BS 8233, allows a reduction of 5 dB(A) in the design aims to a level of 40 dB $L_{Aeq, 16 \text{ hour}}$ daytime and 35 dB $L_{Aeq, 8 \text{ hour}}$ night-time, where development is considered necessary.

Given that this site is the only one available to the two families and that they are choosing to live here, with no availability within other existing sites in the locality, it is considered that the lower design aims are considered appropriate in this situation.

Noise levels within the caravan would achieve the less stringent design aims from BS 8233 and upon this basis, it is considered that there would be reasonable standard of noise internally. The internal noise levels would therefore not result in any significant adverse impacts and comply with the requirements of the NPPF.

An assessment of the noise levels has also been carried out within the proposed day room. The calculations indicate an internal noise level of 34 dB $L_{Aeq, 16 \text{ hour}}$ internally, which would remain marginally below the design aim for living rooms within BS 8233 and 6dB(A) below the noise level for dining areas, which would be the area most exposed to road traffic noise. Given that the design aims would be achieved, it is considered that the noise levels within the day room would be acceptable.

As indicated previously, consideration has been given to the potential of increasing the height of the fencing to provide a further benefit to the two families. The calculations of the noise levels assuming a 2.1 metre high acoustic barrier indicates that the noise levels would reduce by a further 1 dB(A). The small additional benefit would be unlikely to result in a noticeable change in the perception of noise within the two homes and seeks to demonstrate that the location and height of the barrier, as proposed, provides the optimum benefit in noise terms.

6. Summary

LF Acoustics Ltd were appointed by Mr Castle to carry out a noise assessment in support of a planning application for a proposed gypsy and traveller site in land off New Road, Rustington, to allow the siting of a mobile home, touring caravan and the construction of a day room.

It is proposed to site a mobile home and a touring caravan on the land, which would house two families.

The mobile home to be sited would meet the residential specifications defined in BS 3632, with a standard touring caravan proposed, which is of modern construction and fully double glazed.

Calculations of the noise levels attributable to traffic travelling along the A259 which runs to the south of the site have been made to determine the noise levels at the two homes, assuming the construction of the proposed acoustic fence.

An assessment of the noise levels within the proposed mobile home, based upon experience of similar homes, indicated that the guideline values within BS 8233 would be achieved both during the day and night-time periods, ensuring a good internal noise environment.

The touring caravan would have a lower sound insulation, as it does not need to meet the same specification. Based upon measurements obtained in a similar caravan, the internal noise levels within the touring caravan would be higher than within the mobile home, but would still meet the requirements for a reasonable noise environment with regards to the requirements of BS 8233.

In summary, noise levels within the proposed mobile home and touring caravan would meet the requirements of BS 8233, ensuring that there were no significant adverse impacts upon the occupants and thus complying with the guidance contained within the NPPF.

References

1. Ministry of Housing, Communities and Local Government. National Planning Policy Framework. July 2018.
2. Department for Communities and Local Government. Planning Policy for Traveller Sites. August 2015.
3. British Standards Institute. Guidance on Sound Insulation and Noise Reduction for Buildings. BS 8233. 2014.
4. British Standards Institute. Residential Park Homes – Specification. BS 3632:2015.
5. Department of Transport. A Calculation of Road Traffic Noise. 1988.
6. TRL / Defra. Converting the UK Traffic Noise Index $L_{A10, 18h}$ to EU Noise Indices for Noise Mapping. P G Abbott & P M Nelson. 2002.

Figures

Figure 1:
Site Layout

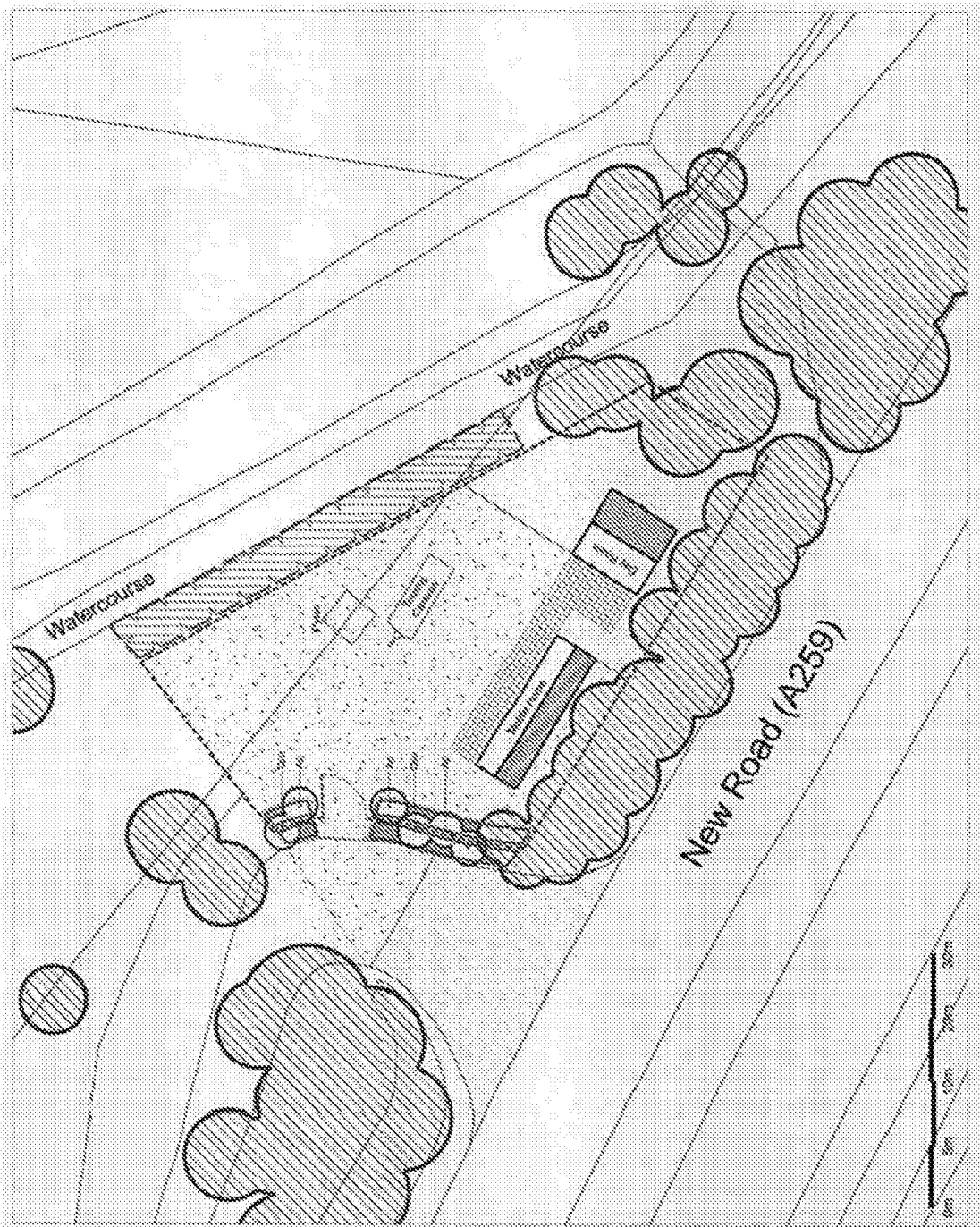


Figure 2:
Proposed Barrier
Construction

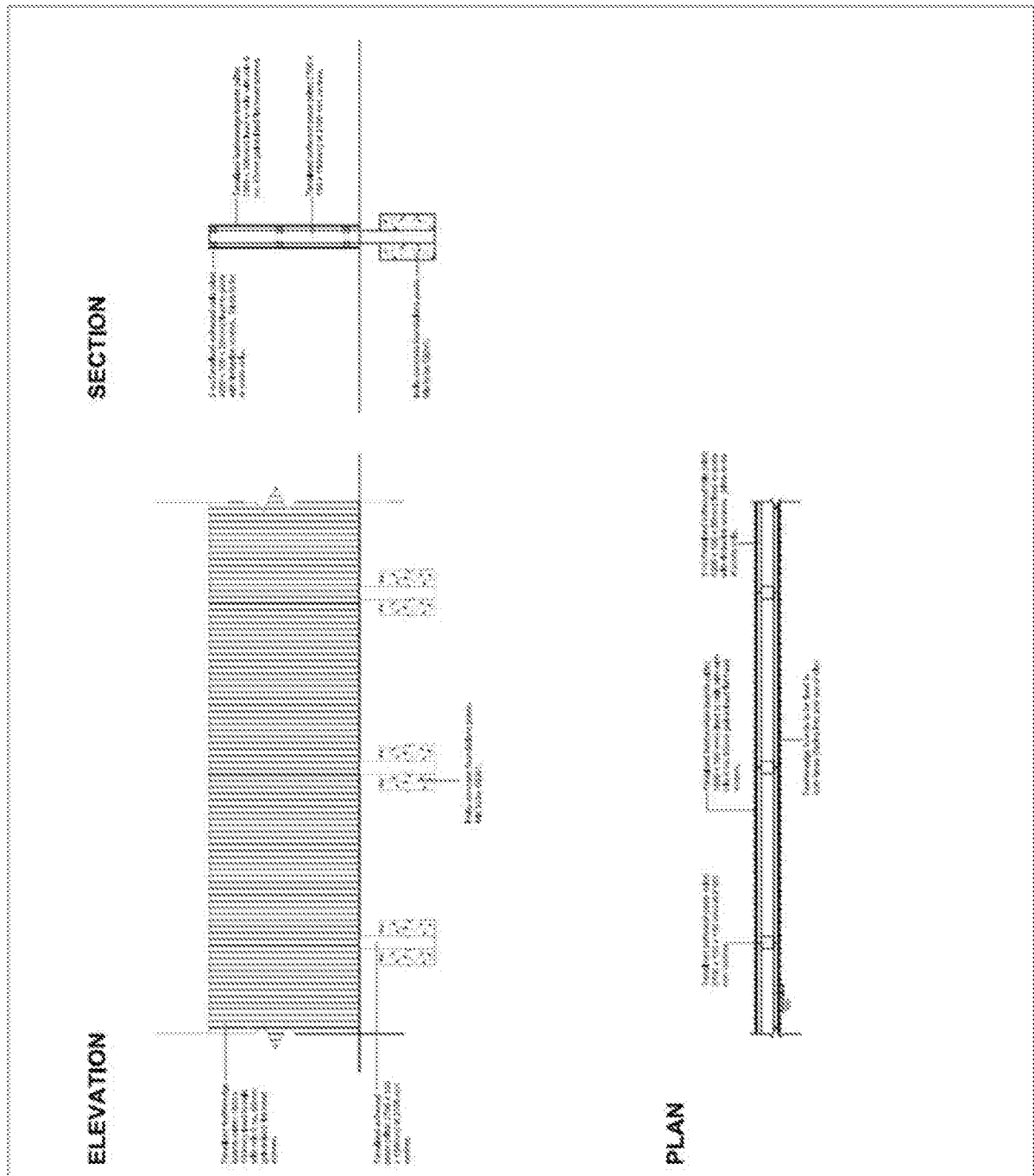
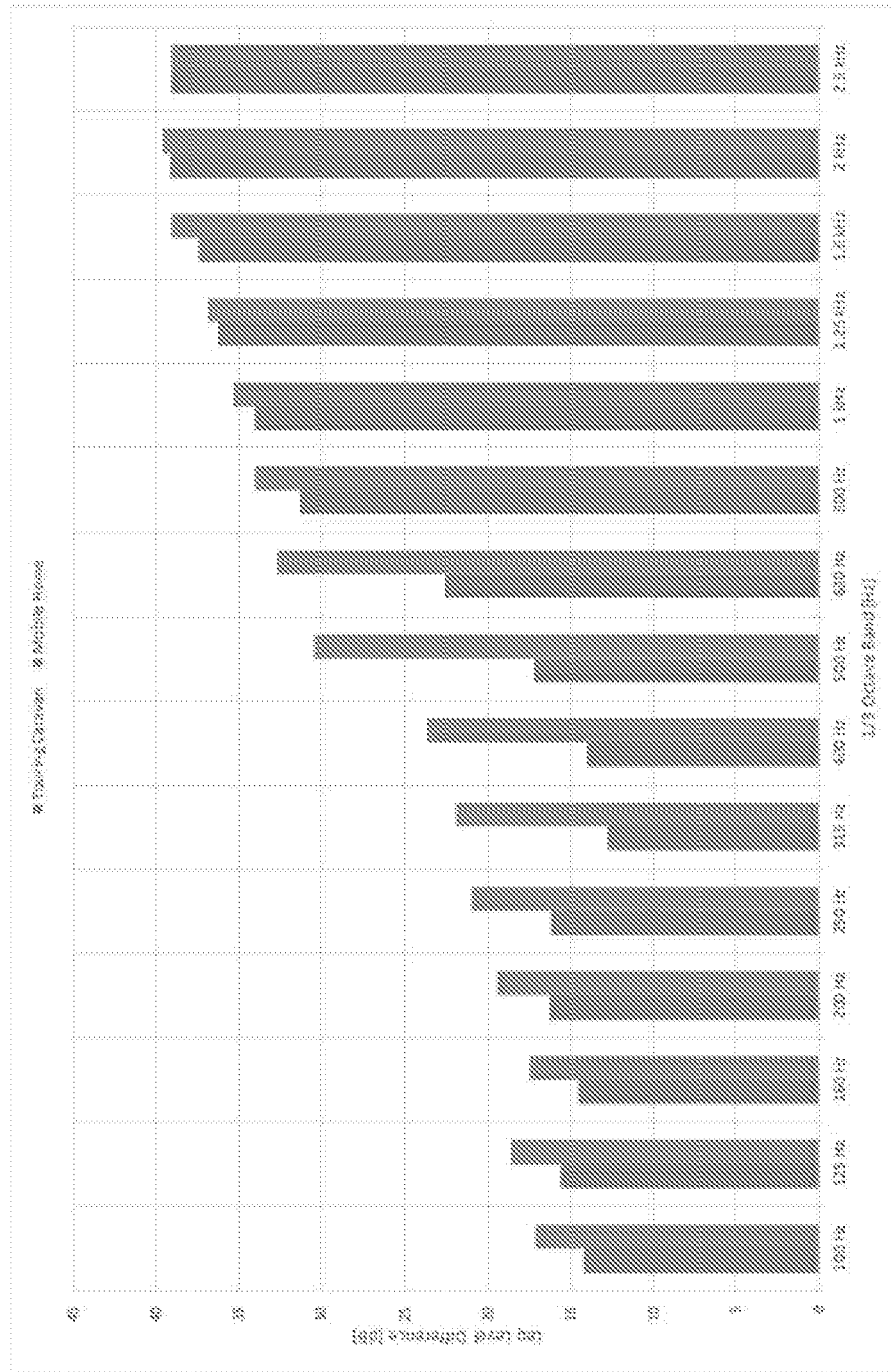
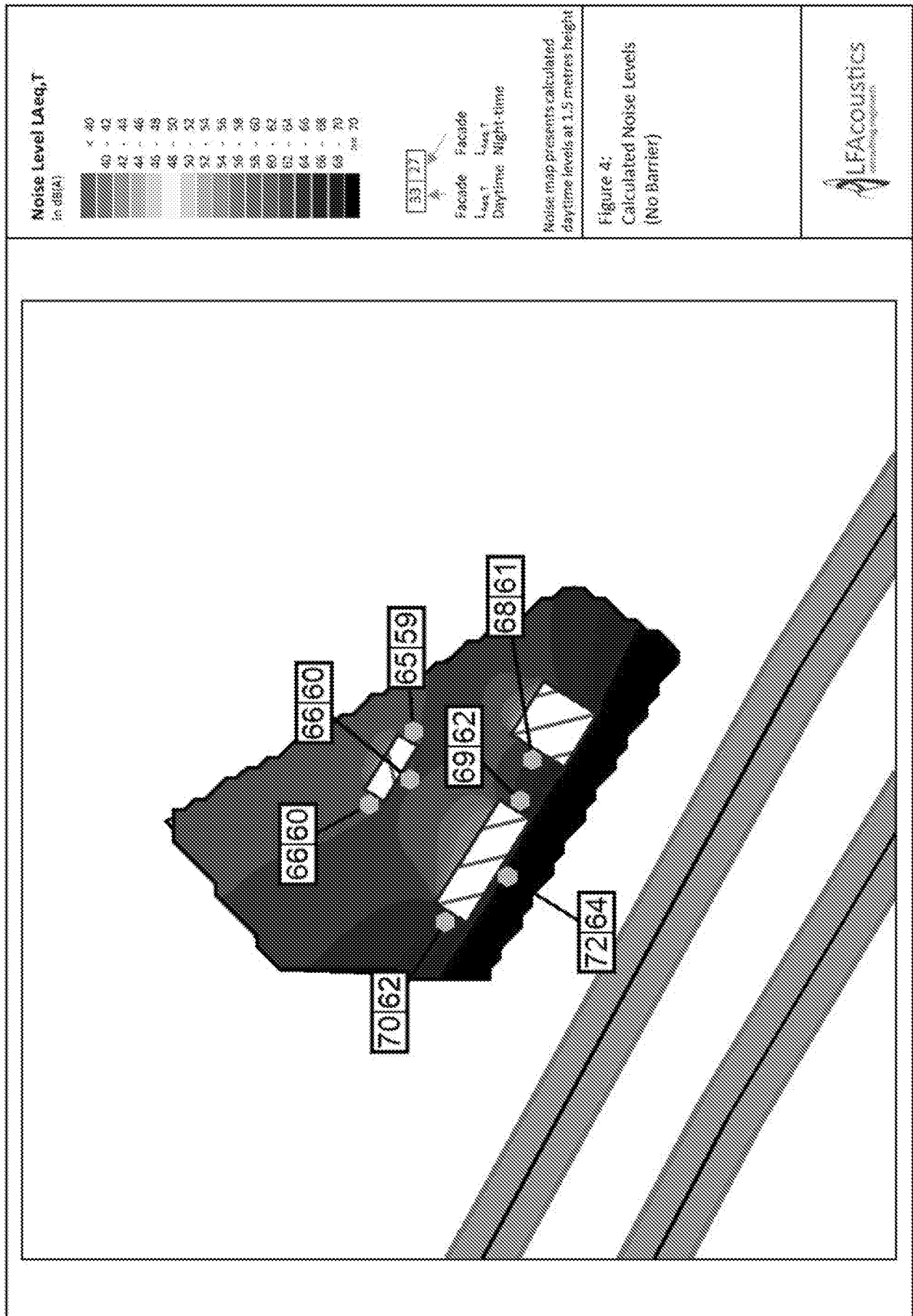
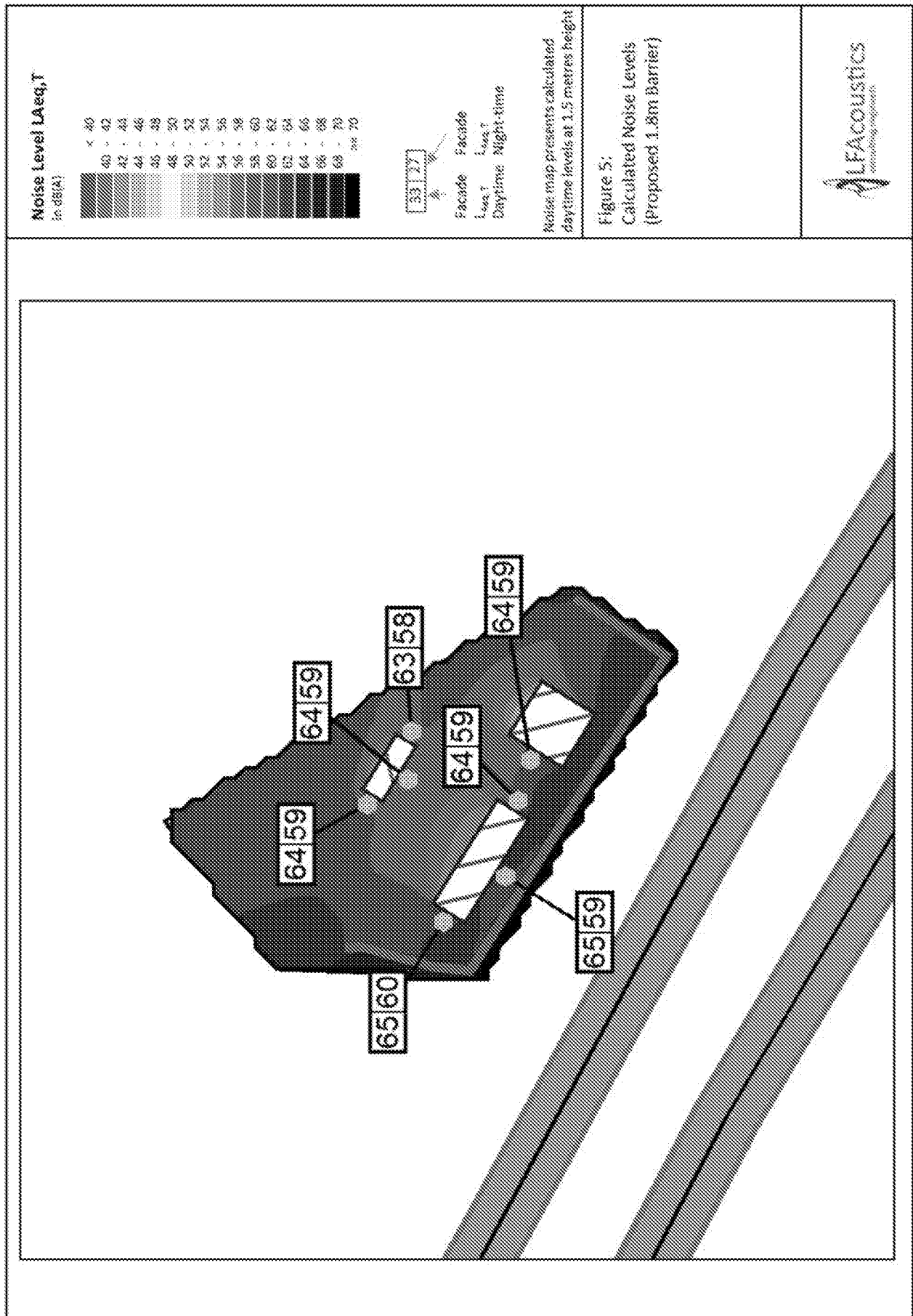
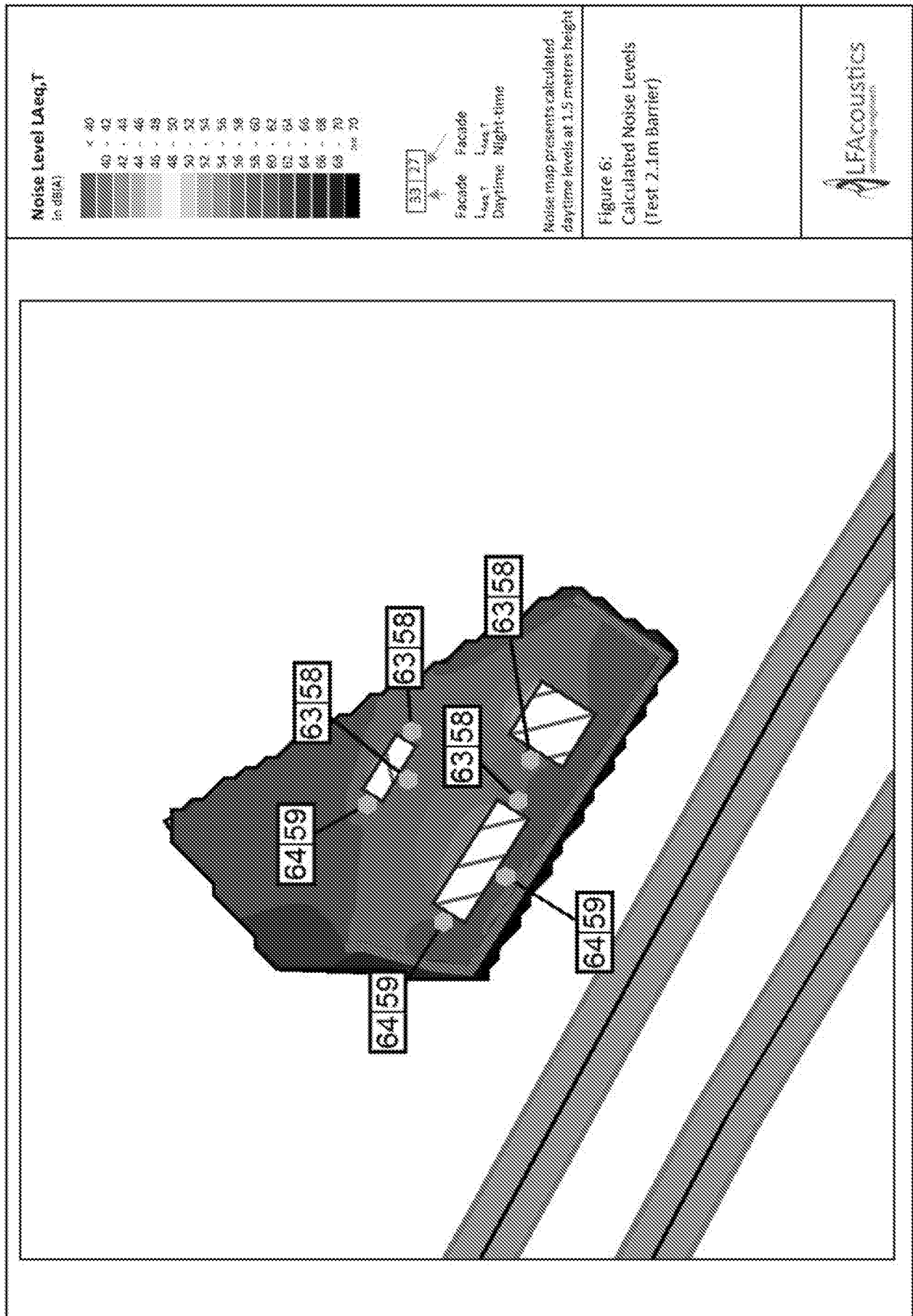


Figure 3:
External / Internal Level
Reduction for Touring
Caravan and Mobile Home









Appendix A

Noise Units

Decibels (dB)

Noise can be defined as unwanted sound. Sound in air can be considered as the propagation of energy through the air in the form of oscillatory changes in pressure. The size of the pressure changes in acoustic waves is quantified on a logarithmic decibel (dB) scale firstly because the range of audible sound pressures is very great, and secondly because the loudness function of the human auditory system is approximately logarithmic.

The dynamic range of the auditory system is generally taken to be 0 dB to 140 dB. Generally, the addition of noise from two sources producing the same sound pressure level, will lead to an increase in sound pressure level of 3 dB. A 3 dB noise change is generally considered to be just noticeable, a 5 dB change is generally considered to be clearly discernible and a 10 dB change is generally accepted as leading to the subjective impression of a doubling or halving of loudness.

A-Weighting

The bandwidth of the frequency response of the ear is usually taken to be from about 18 Hz to 18,000 Hz. The auditory system is not equally sensitive throughout this frequency range. This is taken into account when making acoustic measurements by the use of A-weighting, a filter circuit which has a frequency response similar to the human auditory system. All the measurement results referred to in this report are A-weighted.

Units Used to Describe Time-Varying Noise Sources (L_{Aeq} , L_{A90} and L_{Amax})

Instantaneous A-weighted sound pressure level is not generally considered as an adequate indicator of subjective response to noise because levels of noise usually vary with time.

For many types of noise the Equivalent Continuous A-Weighted Sound Pressure Level ($L_{Aeq,T}$) is used as the basis of determining community response. The $L_{Aeq,T}$ is defined as the A-weighted sound pressure level of the steady sound which contains the same acoustic energy as the noise being assessed over a specific time period, T.

The L_{A90} is the noise level exceeded for 90% of the measurement period. It is generally used to quantify the background noise level, the underlying level of noise which is present even during the quietest part of the measurement period.

The L_{Amax} is the maximum value that the A-weighted sound pressure level reaches during a measurement period. $L_{Amax,F}$, or Fast, is averaged over 0.125 of a second.

Appendix B
Consultation Response

Les Jephson

From: Colin Giddings [REDACTED]
Sent: 12 October 2018 15:33
To: Les Jephson
Subject: RE: Application Ref: A/9/18/PL - Proposed Mobile Home at Norway Lane, Rustington

Follow Up Flag: FollowUp
Flag Status: Flagged

Hi Les,

Thanks for getting in touch.

I am hopeful that a desk based assessment would be sufficient but that would depend on the criteria proposed. My thought process is guided by the nature of the proposed accommodation (I do not know what type of mobile home and / or touring unit is proposed with regard to construction standards -- for example would a residential unit be to BS3632:2015 as ought to be expected? If so what levels of protection would such a unit provide -- I suspect it will be considerably less than a traditional dwelling. How much lower a standard would any touring unit be or would it be only stored on site?

I have also included in my June comments reference to road traffic pollution. It could be that mitigation measures, if any, proposed for noise attenuation may assist in the protection against dust or other pollutants? Your client may wish to consider a joined-up approach.

Kind regards,
Colin

Normally working Thursdays, Fridays and alternate Wednesdays

Colin Giddings | Snn: Environmental Health Officer, Arun District Council | Location: Third Floor, Arun Civic Centre, Maltravers Road, Littlehampton, BN17 5LF

visit Arun's web site at www.arun.gov.uk/eh



Save the environment - think before you print.

From: Les Jephson [REDACTED]
Sent: 12 October 2018 13:25
To: Colin Giddings
Subject: Application Ref: A/9/18/PL - Proposed Mobile Home at Norway Lane, Rustington

Colin

We have been appointed to prepare the noise attenuation for the acoustic barrier you have requested.

From your consultation response dated 22 June 2018, it is not clear exactly what level of assessment you require.

Are you simply looking for a desk based assessment, which indicates the attenuation which would be achieved by the proposed barrier though calculations or would you require a more detailed assessment?

I would be grateful for your advice.

Regards

Les Jephson



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Appendix C

Calculation Details

**Proposed Siting of a Mobile Home and Touring Caravan
On Land off New Road, Rustington**

Calculation of Internal Noise Levels

Mobile Home			Touring Caravan		
Daytime Freefield Level	Omar (BS 3632) External / Internal Diff	Daytime LAeq Internal	Daytime Freefield Level	Typical (D. Glazed) External / Internal Diff	Daytime LAeq Internal
39.0	16.1	22.9	38.0	14.2	23.8
41.7	17.6	24.1	40.7	15.6	25.1
41.1	16.5	24.6	40.1	14.5	25.6
40.6	19.4	21.2	39.6	16.3	23.3
42.8	20.9	21.9	41.8	16.2	25.6
43.7	20.9	22.8	42.7	12.7	30.0
45.3	23.6	21.7	44.3	14.0	30.3
49.7	30.5	19.2	48.7	17.2	31.5
54.7	32.7	22.0	53.7	22.5	31.2
58.7	34.0	24.7	57.7	31.3	26.4
59.5	35.3	24.2	58.5	34.0	24.5
58.5	36.8	21.7	57.5	36.2	21.3
56.5	39.1	17.4	55.5	37.4	18.1
53.0	39.6	13.4	52.0	39.2	12.8
48.6	39.1	9.5	47.6	39.1	8.5
66	Internal Level Day =	34	Day = 65	Internal Level Day =	39
60	Internal Level Night =	28	Night = 59	Internal Level Night =	33

Land off New Road, Rustington
Calculation of Internal Noise Levels

Position : Day Room

Prepared By: LPJ - 17/10/18

STANDARD GLAZING & VENTS

Sf	Facade Area (inc Window)	10
Swi	Window Area	3
Sew	Sf-Swi	7
Srr	Area of Ceiling	12
S	Sf+Srr	22
A0	Ref Absorption Area	12

			Overall	1/3 Octave Band Leq					
			A-Wtd	125	250	500	1000	2000	
Source Level	Leq FF	A	64	60	55	58	62	56	Equivalent Freefield Daytime Level
Window Vent	Dn,e	B		34	33	33	33	34	Standard Trickle Vent
			0.00022	0.00027	0.00027	0.00027	0.00022		
Glazing	Rwi	C		20	17	33	44	49	Standard Glazing 4-16-4
			0.00136	0.00272	0.00007	0.00001	0.00000		
Wall	Rew	D		26	35	43	48	47	
			0.0007992	0.0001006	1.595E-05	5.043E-06	6.349E-06		
Ceiling	Rrr	E		26	35	43	48	47	
			0.0013701	0.0001725	2.734E-05	8.645E-06	1.088E-05		
10Log (B+C+D+E)				-24.259523	-24.858119	-34.14536	-35.33887	-36.269079	
A (Furnished)				11	14	16	16	15	
10*log (S/A)				3.0103	1.9629465	1.383027	1.383027	1.6633142	
Leq,2				41.7	34.8	27.9	31.1	24.4	
A-Weighting				-16.0	-9.0	-3.0	0.0	1.0	
LAeq,2				25.7	25.8	24.9	31.1	25.4	
			Day	Night					
LAeq, Internal			34	29					
Reduction			-30						