A CAF GROUP COMPANY

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Causeway Farm
Osbaldeston

Noise Impact Assessment

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Notice

EXECUTIVE SUMMARY

BWB Consulting (BWB) was instructed by Specialist Diesel Ltd (the Client) to carry out a Noise Impact Assessment to support an outline planning application for a residential development at Causeway Farm, Osbaldeston.

The baseline noise survey and the subsequent assessment work have been undertaken in accordance with current British Standards and relevant guidance documents.

The assessment of external noise levels identified that the upper guideline limit from BS 8233 is likely to be achieved at the worst affected properties, with appropriate mitigation in place.

For dwellings closest to Longsight Road (A59), gardens should be placed on the screened side of buildings. Should gardens face onto Longsight Road (A59), localised acoustic barriers will likely be required for garden areas facing the dominant sources of noise. In addition, for worst affected receptors, enhanced glazing and uprated ventilation will be required which meets a minimum specification of $R_w + C_{tr}$ 32 dB and $D_{n,e,w} + C_{tr}$ 52 dB.

Based on the results of the assessment, it has been demonstrated that the site is suitable for residential development.

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APPENDICES

1. INTRODUCTION

Overview

1.1 BWB Consulting (BWB) was instructed by Specialist Diesel Ltd (the Client) to undertake a Noise Impact Assessment in support of a planning application for a residential development at Causeway Farm, Osbaldeston (The Site).

1.2 This assessment has been undertaken based on the results of a baseline noise survey on the Site. The results of the survey have been assessed in accordance with current British Standards and relevant guidance documents.

1.3 Where appropriate, consideration has been given to outline mitigation measures to reduce noise levels at the proposed properties.

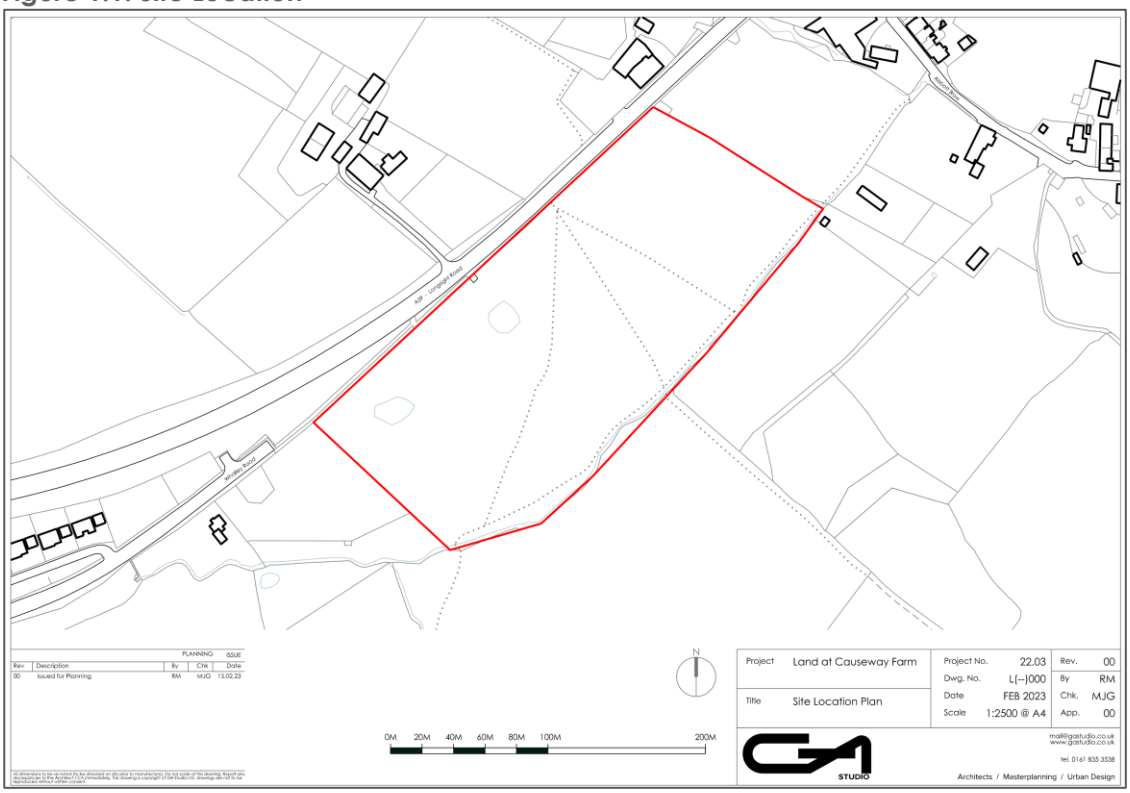
1.4 This report is necessarily technical in nature, so to assist the reader, a glossary of acoustic terminology can be found in **Appendix A**.

Site Setting

1.5 The Site is located in the village of Osbaldeston, within the administrative area of Ribble Valley Borough Council (RVBC) and currently comprises open fields. The Site is bound to the north west by Longsight Road and by open fields in all other directions.

1.6 The location of the Site is shown in **Figure 1.1**.

Figure 1.1: Site Location



Proposed Development

1.7 The development proposals are for low density housing with associated landscaping and infrastructure. The Illustrative Masterplan is shown in **Figure 1.2**.

Figure 1.2: Illustrative Masterplan

2. STANDARDS AND GUIDANCE

National Planning Policy Framework (NPPF)

2.1 Published in December 2024, this document sets out the Government's planning policies for England. It makes the following reference to noise in the section entitled Conserving and enhancing the natural environment:

> "*187. Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> *[…]*
>
> *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin* management plans."

2.2 It also makes the following references to noise in the Section entitled Ground conditions and pollution:

> "*198. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
>
> *a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life[72];*
>
> *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*
>
> *[72] See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010).*"

BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

2.3 This standard provides guidance for the control of noise in and around buildings. The guidance provided within the document is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

2.4 The guidance provided includes appropriate internal and external noise level criteria which are applicable to dwellings (residential properties) for steady external noise sources. It is stated that it is desirable that internal ambient noise levels do not exceed the following criteria set out in **Table 2.1** below:

Table 2.1: Summary of Internal Ambient Noise Levels - Habitable Rooms

Activity	Location	Internal noise level criteria ($L_{Aeq,T}$, dB)	
		Daytime (07:00 - 23:00hrs)	Night-time (23:00 - 07:00hrs)
Resting	Living room	35	-
Dining	Dining room/area	40	-
Sleeping (daytime resting)	Bedroom	35	30

2.5 It is noted in the standard that "*Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.*". As such, noise levels 5 dB above those from **Table 2.1** are considered to be 'reasonable'.

2.6 Whilst BS 8233:2014 recognises that a guideline value may be set in terms of Sound Exposure Level (SEL) or L_{AFmax} for the assessment of regular individual noise events that can cause sleep disturbance during the night-time, a specific criterion is not stipulated. Accordingly, reference has been made in this assessment to the World Health Organisation (WHO) 1999: Guidelines for Community Noise.

2.7 With respect to external amenity space such as gardens and patios it is stated that it is desirable that the noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. It is then confirmed that higher external noise criteria may be appropriate under certain circumstances such as within city centres urban areas, and locations adjoining the strategic transportation network, where it may be necessary to compromise between elevated noise levels and other factors such as convenience of living, and efficient use of land resource.

World Health Organisation (WHO) 1999: Guidelines for Community Noise

2.8 The World Health Organisation (WHO) guidance: 1999: Guidelines for community noise includes guidance for individual maximum noise events during the night-time. This document draws upon guidance from Vallet and Vernay, which states:

> "*For good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than 10-15 times per night*"

Approved Document O (Overheating Mitigation)

2.9 This document provides guidance on how to comply with Part O of the building regulations. The aim of Part O of the building regulations is to protect the health and welfare of occupants of the building by reducing the occurrence of high indoor temperatures. Approved Document O (ADO) provides guidance on how to comply with Part O of the building regulations and applies to new residential development only.

2.10 Paragraphs 3.2 and 3.3 of ADO refer to noise within bedrooms at night. It is considered that the intention is to manage the impact from sound generated from all non-natural sources. Sources such as road, rail and air traffic, sources of an industrial or commercial nature, and sounds arising from entertainment venues are all within scope.

2.11 Paragraph 2.10 of ADO lists the means for removing excess heat as:

- *"Opening Windows*
- *Ventilation louvres in external walls*
- *A mechanical ventilation system*
- *A mechanical cooling system"*

2.12 Paragraph 3.2 of AD-O states:

"In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take into account of the likelihood that windows will be closed during sleeping hours (11pm to 7am)."

2.13 Paragraph 3.3 of AD-O states:

"Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

(a) 40 dB $L_{Aeq,T}$ averaged over 8 hours (between 11pm and 7am).

(b) 55 dB L_{AFmax} more than 10 times a night (between 11pm and 7am)."

2.14 The document goes on to state that ventilators and windows should be open as required based on the overheating mitigation strategy. Where there is a natural ventilation strategy using open windows, the extent to which windows will need to be opened will depend on the physical arrangement, environmental conditions, and the number of room occupants, as determined in the CIBSE TM59 dynamic thermal modelling.

2.15 The Association of Noise Consultants (ANC) issued a guide in November 2024 entitled "Approved Document O Noise Guide".

2.16 Table 1 of this guidance document is replicated in **Table 2.2** and defines the noise levels at moderate and low-risk locations when considering the simplified assessment method.

Table 2.2: Permissible External Noise Levels - Simplified Method ADO

Parameter	High Risk Location	Moderate Risk Location
$L_{Aeq, 8h}$ (between 11pm and 7am)	45 dB	50 dB
L_{AFmax} more than 10 times a night (between 11pm and 7am)	60 dB	65 dB

2.17 For clarity, the above table suggests that the sound insulation performance of the external building fabric when a window is open wide enough to comply with the guidance in ADO, is only in the region of 5 dB for high risk locations (where the opening is larger), and 10 dB for moderate risk locations (where the required window opening is smaller).

2.18 Where the simplified method cannot be used, dynamic thermal modelling is required following the procedures of CIBSE TM59. The equivalent area of the open windows required to mitigate overheating determined through thermal modelling can then be used to determine internal noise levels and compare against the ADO acoustic criteria.

Ribble Valley Borough Council

2.19 The Environmental Health Department at RVBC was consulted on the assessment approach via email on 01st October 2025. A summary of the pertinent points raised is as follows:

- Noise survey previously undertaken in October 2022, from which the data are still considered valid for use.
- Dominant source of noise across the site is road traffic noise from Longsight Road
- Noise from the Petrol Station on the opposite side of Longsight Road and the car dealership approximately 100m to the north east was not apparent during previous site visits. Neither are considered significant source of noise.
- The intended assessment will consider:
    - the potential noise impact of the local environment for the proposed residential properties (transport noise from A59) in accordance with *BS 8233 / Guidelines for Community Noise* (WHO)
    - the balance between overheating risk and internal noise levels (LAeq/LAFmax) using the simplified method from the *Approved Document O Noise Guide* (ANC/IOA)

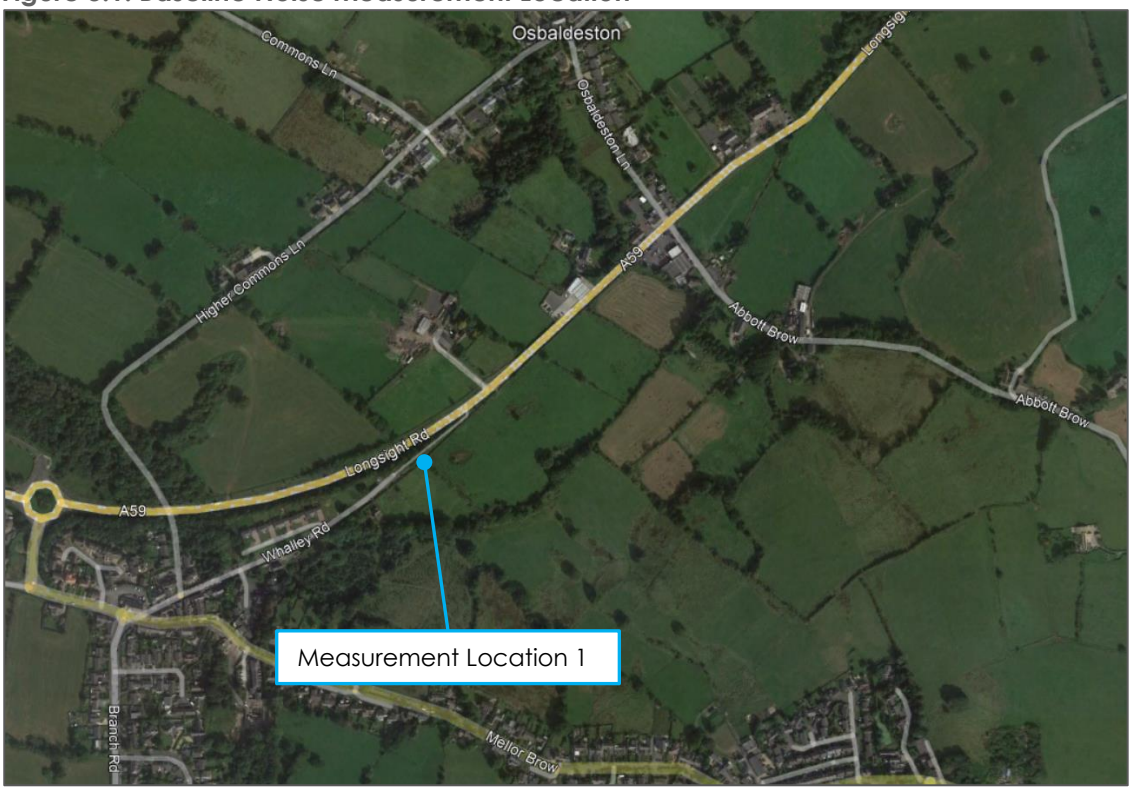
2.20 Nicola Berry from RVBC responded via telephone on 8th October 2025 stating that the intended approach is accepted, though evidence should be provided to demonstrate that road traffic noise had not increased since 2022, which was agreed to by BWB Consulting Ltd.

3. BASELINE NOISE AND VIBRATION SURVEY

Summary

3.1 A baseline noise survey has been undertaken to determine the prevailing road traffic noise levels affecting the Site. The measurement location adopted during the survey is identified in **Figure 3.1**.

Figure 3.1: Baseline Noise Measurement Location



Survey Methodology

3.2 Continuous unattended noise measurements were undertaken at Measurement Location 1 (ML1) between 16:00 on Friday 14th October 2022, and 07:00 on Tuesday 18th October 2022. The measurement equipment was established in free-field conditions at a height of 1.8 m above local ground level.

3.3 Measurement equipment was established approximately 25 m to the south of Longsight Road. During periods of attendance on site, the noise climate was noted to be dominated by road traffic on Longsight Road.

Measurement Equipment

3.4 The baseline noise survey was undertaken using the Class 1 specification noise measurement equipment detailed in **Table 3.1**. Equipment was calibrated using a portable calibrator immediately before and after the measurements with no significant drift in calibration observed. The sound level meter, pre-amplifier and microphone were calibrated to traceable standards at an accredited laboratory within the 24 months

prior to the measurements. The portable calibrators were calibrated within the 12 months preceding the date of the survey.

Table 3.1: Noise Measurement Equipment

Position	Equipment	Make & Model	Serial Number
ML1	Sound Level Meter	SVAN 971	60745
	Microphone	ACO 7052E	64535
	Preamp	SV18	66815
	Calibrator	01dB-Stell Cal 21	34675335

Meteorological Conditions

3.5 The weather throughout the survey remained generally conducive to environmental noise measurement, it being generally dry with low winds (<5ms^{-1}). There were some periods of light rain on Saturday and Sunday night, but the periods of rainfall are considered unlikely to significantly impact the survey results.

Measurement Results

3.6 A summary of daytime and night-time noise levels measured at ML1 are presented in **Table 3.2**. A graphical summary of the survey data is presented in **Appendix B**.

Table 3.2 : Summary of Measured Sound Pressure Levels at ML1

Description	Start Date and Time	Period (T)	dB $L_{Aeq,T}$	dB L_{A90}[1]	dB L_{AFmax}[2]
Friday Day	14/10/2022 16:00	7-hours	55	46	-
Friday Night	14/10/2022 23:00	8-hours	47	36	63
Saturday Day	15/10/2022 07:00	16-hours	56	50	-
Saturday Night	15/10/2022 23:00	8-hours	49	39	66
Sunday Day	16/10/2022 07:00	16-hours	55	46	-
Sunday Night	16/10/2022 23:00	8-hours	51	41	65
Monday Day	17/10/2022 07:00	16-hours	56	48	-
Monday Night	17/10/2022 23:00	8-hours	48	37	64

[1] Taken to be the mean of measured $L_{A90,15min}$ values during relevant period
[2] 90th Percentile of $L_{AFmax,15min}$ noise levels measured during night-time.

Table 3.3: Summary of Average (logarithmic) Octave Band Sound Pressure Levels at ML1

Period	Octave Band Sound Pressure Levels (L_{eq} dB)								dB(A)
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	
Day	61	57	53	50	53	47	42	41	56
Night	56	51	46	44	46	41	37	35	49

Survey Data Validation

3.7 To establish that the road traffic data from October 2022 remain valid for use in 2025, as requested by RVBC, annual average daily flow data from the Department for Transport[1] have been compared for the years 2022 , 2023 and 2024 (data are not yet available for the current year). The relevant data are presented in **Table 3.3** below.

Table 3.3 : Summary of 24 hour Annual Average Daily Flow Traffic Data

Year	Heavy Goods Vehicles	All Motor Vehicles
2024	926	15749
2023	933	15566
2022	970	15271

3.8 The data in **Table 3.3** indicate a 3 % increase in traffic flow between the years 2022 and 2024. Whilst data are not yet available for 2025, **Table 3.3** suggests a year-on-year increase in traffic flow of 1-2 %. An extrapolation of these data indicates a projected increase in traffic flow between 2022 and 2025 of around 5 %.

3.9 In the context of road traffic noise, CRTN advises that an increase in traffic flow of 25 % would only equate to a 1 dB increase in noise level, all other factors remaining equal. Consequently, an increase of 5 % would result in a negligible noise level increase (i.e. less than 1 dB).

3.10 Of the other primary factors which may affect road traffic noise, traffic speeds are understood not to have changed, and the number of heavy vehicles has decreased marginally, year-on year. Therefore, the survey data from 2022 are considered to be sufficiently representative of road traffic noise levels in 2025.

[1] Road traffic statistics - Manual count point: 36608

4. ASSESSMENT

4.1 This section presents an assessment of the suitability of the site for its intended residential use, which considers the potential impact from road traffic noise, based on the Illustrative Masterplan (see **Figure 1.2**). This assessment is informed by the results of the noise survey, outlined in Section 3.

Acoustic Model

4.2 In order to predict noise levels across the site during the daytime and night-time periods, a 3D acoustic model of the site and surrounding area has been generated using the acoustic modelling software CadnaA®. The model was generated applying the following methodology:

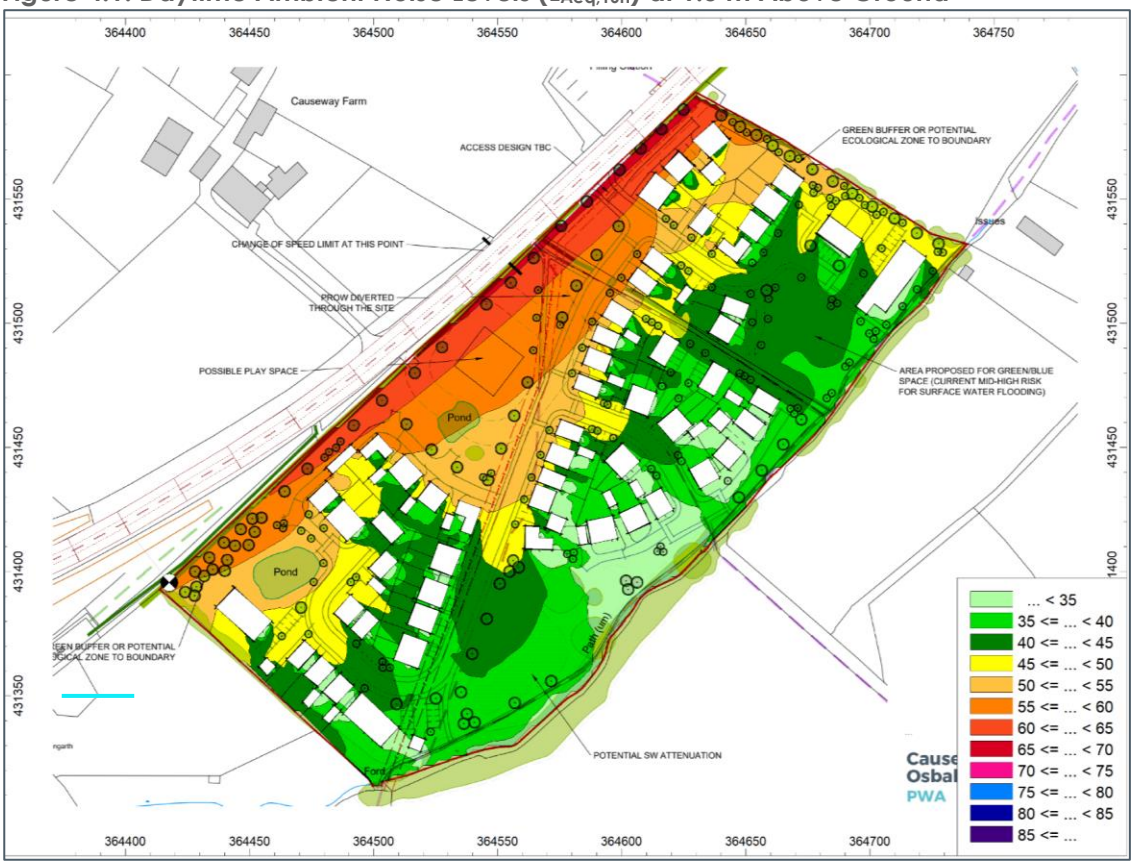
- For the assessment of road traffic noise, the model was set to apply the prediction methodology from the Department for Transport document Calculation of Road Traffic Noise (CRTN).
- L_{AFmax} noise levels have been predicted with a simplified model of a point source correction (6 dB reduction per doubling of distance) from the nearside kerb edge of the road.
- Topographical data for the ground levels across the site and surrounding area, obtained from LIDAR data of 1 m resolution, publicly available from the Department for Environment Food and Rural Affairs (DEFRA) was included.
- The model was set to include second order reflected noise from solid structures. All buildings were set to be acoustically reflective.
- The heights of proposed properties within the model have been set at 8 m and the heights of existing buildings surrounding the site have been determined using online mapping sources.
- Ground cover has been assumed to have an absorption coefficient of 0.5 to account for the varied absorptive and reflective conditions across the site and surrounding area.
- For the prediction of noise levels during the daytime, receptor points within the model have been set at 1.5 m above local ground level. For the night-time, receptor points have been set at 4 m, to be representative of bedrooms at first floor level.

4.3 In order to calibrate the acoustic model, a receptor point has been set within the model which is representative of the height and location of ML1. The road source has then been calibrated at the receptor point until the modelled ambient noise levels for the daytime and night-time periods equalled those measured at ML1.

External Noise Levels for Residential Properties

4.4 **Figure 4.1** presents the predicted ambient noise levels from road traffic across the site during the daytime ($L_{Aeq,16h}$).

Figure 4.1: Daytime Ambient Noise Levels ($L_{Aeq,16h}$) at 1.5 m Above Ground



4.5 **Figure 4.1** indicates that noise levels during the daytime are predicted to meet or fall below the recommended upper guideline value of 55 dB $L_{Aeq,16h}$ in all external amenity spaces (i.e. private gardens and the shared garden space) demarked in the Illustrative Masterplan. Therefore, noise levels across external amenity spaces are acceptable and consideration of forms of mitigation to reduce external noise levels is not required.

Internal Noise Levels for Residential Properties

4.6 For the assessment of road traffic noise levels within sensitive internal spaces during the daytime, consideration must be given to the ambient noise level ($L_{Aeq,16h}$). For the night-time, consideration must be given to both the ambient noise level ($L_{Aeq,8h}$), and the maximum noise level from individual, or distinctive noise events (L_{AFmax}).

4.7 Based on the adopted internal ambient noise level criterion of 35 dB $L_{Aeq,16h}$ for the daytime, the equivalent external level, assuming a partially open window provides 15 dB noise attenuation, is 50 dB $L_{Aeq,16h}$.

4.8 Based on the adopted internal ambient noise level criterion of 30 dB $L_{Aeq,8h}$ for the night-time, and 45 dB L_{AFmax} for maximum noise levels, the equivalent external levels, assuming a partially open window provides 15 dB noise attenuation, are 45 dB $L_{Aeq,8h}$ and 60 dB L_{AFmax}, respectively.

4.9 **Table 4.1** presents the predicted external noise levels at the properties nearest to Longsight Road.

Table 4.1: Predicted noise levels during the daytime and night-time

Receptor	Predicted Ambient Noise Levels, dB $L_{Aeq,T}$		Predicted Typical Maximum Noise Levels, dB $L_{AFmax,T}$
	Daytime (07:00-23:00)	Night-time (23:00-07:00)	Night-time (23:00-07:00)
Nearest to Longsight Road (A59)	61	54	69

4.10 **Table 4.1** indicates that noise levels at the worst affected properties in the vicinity of Longsight Road are predicted to exceed the daytime and night-time ambient noise level criteria and the night-time maximum noise level criterion. Therefore, consideration has been given to the sound insulation that can be afforded by the building envelope with windows closed and ventilators open.

4.11 At this preliminary stage, in advance of the internal design of the proposed properties, the sound insulation performance of the glazing necessary to meet the 'desirable' internal noise level criteria can be estimated by subtracting the criteria from the predicted external noise levels.

4.12 It is predicted that the internal ambient noise level criteria from BS 8233, and the maximum noise level criterion from WHO can be achieved within future properties in the worst affected area with the inclusion of double glazing which has a sound insulation performance of circa 31 dB R_w. This includes a cautionary 5 dB allowance to account for occasional variation of in-situ performance.

4.13 Acoustic trickle ventilators are likely to be sufficient to provide the necessary ventilation whilst not undermining the sound insulation performance of the glazing. This issue is best addressed at detailed design stage once further information is available.

Internal Noise Levels and Overheating

4.14 Consideration has been given to the balance between habitable noise levels within internal spaces and thermal comfort. This assessment is based on guidance set out in ADO, the ANC "Approved Document O Noise Guide" and the predicted noise levels at the proposed properties.

4.15 As the proposed development site is in a 'moderate risk' location as defined in ADO, the noise levels external to the properties should not exceed the following during night-time, in accordance with Approved Document O Noise Guide:

- 50 dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).
- 65 dB L_{AFmax}, more than 10 times a night (between 11pm and 7am).

4.16 Whilst is likely that external noise levels incident upon proposed properties set further back from Longsight Road would not exceed the noise level criteria in paragraph 4.15, properties nearest to the road would be exposed to noise levels which exceed these criteria. Consequently, in accordance with the Approved Document O Noise Guide, dynamic thermal modelling, following the procedures of CIBSE TM59, is required to assess

the risk of overheating under realistic occupancy and environmental conditions. This issue is best addressed at detailed design stage once further information is available.

5. MITIGATION

5.1 In **Section 4**, it has been determined that consideration should be given to mitigation measures to protect the amenity of sensitive receptors associated with the proposed development.

Road Traffic

External Noise Levels

5.2 To reduce the noise impact at proposed dwellings and gardens nearest to Longsight Road (A59) to within acceptable levels, it is recommended that gardens are located on the screened side of dwellings in the first instance. Should gardens face onto Longsight Road (A59), then localised acoustic barriers will likely be required around garden areas. It is widely accepted that an acoustic barrier which removes line of sight to the road will provide a reduction of around 10dB.

5.3 Localised barriers should have a minimum surface density of 15kg/m^2 and form a continuous unbroken barrier with no gaps at the bottom. This could be achieved with a suitably designed close boarded timber fence meeting this minimum specification.

5.4 The exact height, location and extent of any barriers required can be determined once plans reach a more detailed stage.

Internal Noise Levels

5.5 In order to assess the noise mitigation required to ensure an adequate level of protection against noise, it is appropriate to explore in the first instance the protection that could be afforded by the sound insulation performance of the external building fabric, and in particular the glazing elements.

5.6 Detailed noise break-in calculations have been undertaken in accordance with the rigorous method from section G.2 from BS 8233 based on the frequency spectra measured on Site and the following assumed dimensions and assumptions;

- Room dimensions of 3m (width) x 2.5m (depth) x 2.5m (height);
- Double glazed window dimensions of 1.2m (width) x 1.2m (height);
- External building fabric elements shall achieve a sound reduction performance of at least $R_w + C_{tr}$ 48dB;
- A reverberation time of 0.5 seconds; and
- Assumed ventilator(s) provide an equivalent area of 8000mm^2 per habitable room, in accordance with Approved Document F.

5.7 To achieve the daytime internal noise criterion of 35 dB $L_{Aeq,16h}$ adopted for this assessment, based on the façade closest to Longsight Road (A59) experiencing 61 dB $L_{Aeq,16h}$ free-field at the facade, a reduction of 26 dB would be required for habitable rooms. To achieve the internal criteria of 30 dB $L_{Aeq,8h}$ and 45 dB L_{AFmax} during the night-

time, adopted for this assessment, a reduction of up to 24 dB would be required for habitable rooms.

5.8 For dwellings located closest to Longsight Road (A59), all internal criteria would be achieved with double glazing (example configuration: 10 mm / (6-16mm) / 6 mm), which would need to provide a minimum $R_w + C_{tr}$ of 32 dB. Three acoustic trickle ventilators, which achieve a minimum performance of $D_{n,e,w} + C_{tr}$ 40 dB, such as the Greenwood 2500EA + 1 Acoustic Set, would be required.

5.9 The octave band sound reduction index levels for the specified glazing and ventilation are provided in **Tables 5.1 and 5.2** below.

Table 5.1: Advised Glazing Specifications

Product	Octave Band Sound Reduction (SRI) (L_{eq} dB)								$R_w + C_{tr}$
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	
10 mm / (6-16mm) / 6 mm	22	24	24	32	37	37	44	49	32

Table 5.2: Advised Ventilation Specifications

Product	Octave Band Level Difference for Ventilation (L_{eq} dB)								$D_{n,e,w} + C_{tr}$
	63 Hz	125 Hz	250 Hz	500 Hz	1kHz	2kHz	4kHz	8kHz	
Greenwood 2500EA + 1 Acoustic Set	32	41	39	36	42	44	45	-	40

5.10 For dwellings that are located further back into the site that benefit from screening provided by the development itself, it is likely that standard double glazing and ventilation will be sufficient to mitigate noise to acceptable levels.

5.11 The above presents solutions to satisfy the proposed internal ambient noise limits within habitable room during normal ventilation conditions.

5.12 **Table 5.3** shows the resultant internal noise levels at the notional receptor, with mitigation in place.

Table 5.3: Predicted external and internal noise levels with mitigation, dB

Facade	Predicted External Noise Level, free-field			Resultant Internal Noise Level		
	$L_{Aeq,16h}$	$L_{Aeq,8h}$	L_{AFmax}	$L_{Aeq,16h}$	$L_{Aeq,8h}$	L_{AFmax}
Closest to Longsight Road (A59)	61	54	69	32	26	41

5.13 It is considered that with the suggested mitigation and the above specifications, internal and external rating levels will be within the BS8233 internal and external noise criterion. Therefore, impacts from noise associated Longsight Road (A59) will be low in context.

5.14 The final glazing and ventilation schedule should be finalised on a plot-by-plot basis at the appropriate design stage by a qualified acoustician, once the final internal layouts and glazing areas for each room are known.

6. CONCLUSIONS

6.1 This report presents the results of the baseline noise survey, which has been used to determine the Site's suitability for the proposed residential use.

6.2 The assessment of external noise levels identified that the upper limit guideline value from BS 8233 is likely to be achieved at the worst affected properties, with appropriate mitigation in place.

6.3 For dwellings closest to Longsight Road (A59), gardens should be placed on the screened side of buildings. Should gardens face onto Longsight Road (A59), localised acoustic barriers will likely be required for garden areas facing the dominant sources of noise. In addition, for worst affected receptors, enhanced glazing and uprated ventilation will be required which meets a minimum specification of $R_w + C_{tr}$ 32 dB and $D_{n,e,w} + C_{tr}$ 40 dB.

6.4 Based on the results of the assessment, it has been demonstrated that the site is suitable for residential development.

APPENDICES

APPENDIX A: Glossary of Acoustic Terms

Noise

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

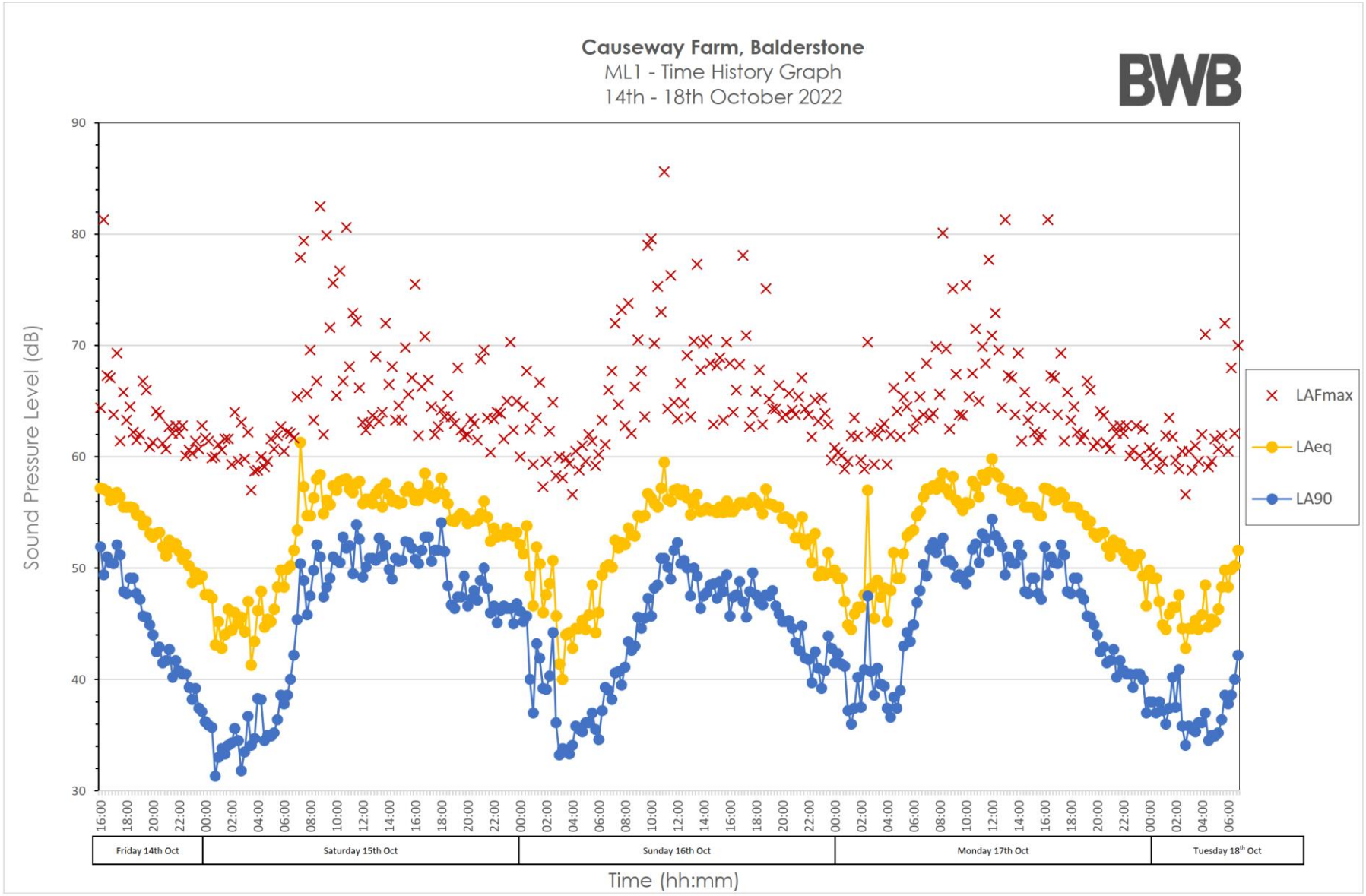
The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq}, L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

Acoustic Terminology

Term	Description
dB (decibel)	The scale on which sound pressure level is expressed. Sound pressure level is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2x10-5Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' - weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
$L_{Aeq,T}$	L_{Aeq} is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.
L_{Amax}	L_{Amax} is the maximum A - weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L_{10} and L_{90}	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time, and the L_{90} is the level exceeded for 90% of the time.
Sound Power Level, L_w	logarithm of the ratio of a given sound power to the reference sound power. Such power level in decibels is ten times the logarithm to the base ten of the ratio. unless otherwise specified, the reference sound power is 1 pW. Sound power is the total sound energy radiated by a sound source and measured in watts (W). Sound power level
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally, as measured outside and away from buildings.
Façade Level	A sound field determined at a distance of 1m in front of a large sound reflecting object such as a building façade.
R/R_w	R is the laboratory measurement of the sound insulating properties of a material or building element in a stated frequency band R_w is the weighted Sound Reduction Index a single number quantity which characterises the airborne sound insulation of a material or building element over a range of frequencies, based on laboratory measurements.
D_{ne}/$D_{ne,w}$	D_{ne} is the laboratory measured level difference of a building element which has been normalised to a referenced absorption of 10$m^{2.}$ $D_{ne,w}$ is the weighted element-normalised level difference. This is a single number quantity which characterises the airborne sound insulation of a building element over a range of frequencies, based on laboratory measurements.
C_{tr}	Spectrum Adaptation Terms (C and C_{tr}) the single number rating method defined in BS EN ISO 717 uses a standard reference curve to determine the weighted value of airborne sound insulation. The spectrum adaptation term C_{tr} is used to take into urban traffic noise.

APPENDIX B: Noise Survey Data


Causeway Farm, Balderstone
ML1 - Time History Graph
14th - 18th October 2022
BWB
Sound Pressure Level (dB)
90
80
70
60
50
40
30
LAFmax
LAeq
LA90
16:00
18:00
20:00
22:00
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
02:00
04:00
06:00
Friday 14th Oct
Saturday 15th Oct
Sunday 16th Oct
Monday 17th Oct
Tuesday 18th Oct
Time (hh:mm)

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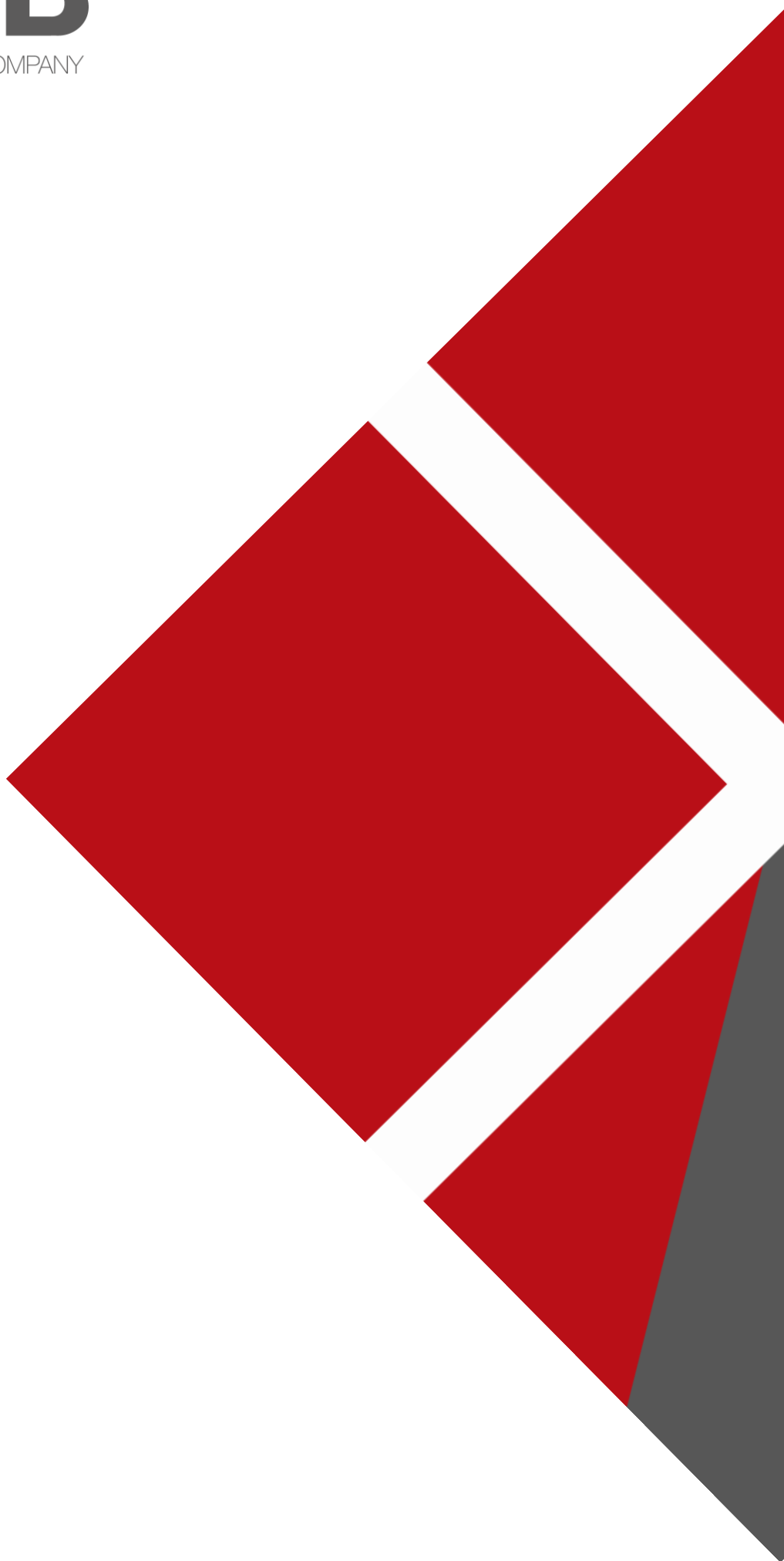

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