



Architectural & Environmental Consultants

Noise | Vibration | Air Quality

Noise Impact Assessment

Sparkle Street, Manchester

Noise Impact Assessment

Project: SPARKLE STREET, MANCHESTER

Report reference: RP02-23244-R3

Client: FORAS (SPARKLE STREET) LTD
4 ELSTREE WAY
BOREHAMWOOD
HERTFORDSHIRE
WD6 1RN

Our details: CASS ALLEN ASSOCIATES LTD
BEDFORD I-LAB
BEDFORD
MK44 3RZ

Document control:

REVISION	ISSUE DATE	REPORT BY	CHECKED BY	NOTES
0	15 June 2023	Laura Broadley, MSc MIOA, Acoustics Consultant	Tim Ives, PhD BEng CEng FIOA, Technical Director	Initial issue
1	22 June 2023	Laura Broadley, MSc MIOA, Acoustics Consultant	Tim Ives, PhD BEng CEng FIOA, Technical Director	Minor Revisions
2	19 July 2023	Laura Broadley, MSc MIOA, Acoustics Consultant	Tim Ives, PhD BEng CEng FIOA, Technical Director	Minor Revisions
3	19 April 2024	Tim Ives, PhD BEng CEng FIOA, Technical Director		Minor Revisions

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY
2. INTRODUCTION
3. PROJECT DESCRIPTION
4. PLANNING POLICY
5. NOISE AFFECTING THE DEVELOPMENT
6. GROUND-BORNE VIBRATION AFFECTING THE DEVELOPMENT
7. PLANT NOISE IMPACT ASSESSMENT
8. CONCLUSIONS

APPENDIX 1 DEVELOPMENT LAYOUT

APPENDIX 2 SURVEY RESULTS

APPENDIX 3 MODELLING RESULTS

APPENDIX 4 FACADE CALCULATIONS

APPENDIX 5 OUTLINE ACOUSTIC FACADE SPECIFICATION

1. EXECUTIVE SUMMARY

- 1.1 Cass Allen has been instructed by Foras (Sparkle Street) Ltd to assess the noise and vibration impact of a proposed new development at Sparkle Street in Manchester.
- 1.2 The assessment was carried out in accordance with relevant local and national planning guidance.
- 1.3 A noise and vibration survey was carried out at the site. Noise levels at the site are dictated by road traffic noise emissions from Store Street and, to a lesser extent, Sparkle Street.
- 1.4 A 3D noise model of the development was constructed based on the results of a site noise survey. The noise model was used to calculate noise levels at all facades of the development.
- 1.5 Noise affecting the development has been assessed in accordance with the ProPG guidance. The design of the development is considered to be acceptable subject to the adoption of acoustically upgraded glazing and ventilation. This can be investigated further at the detailed design stage.
- 1.6 Ground-borne noise and vibration levels at the site have been measured and are considered to be acceptable for the development.
- 1.7 Appropriate limits for noise from mechanical plant have been calculated based on measured noise levels at the site and guidance given in BS4142. This will be investigated further at the detailed design stage.
- 1.8 In summary of the above it is our view that the site is suitable for the development in terms of noise and vibration levels and that planning permission should be granted subject to the imposition of suitable planning conditions.

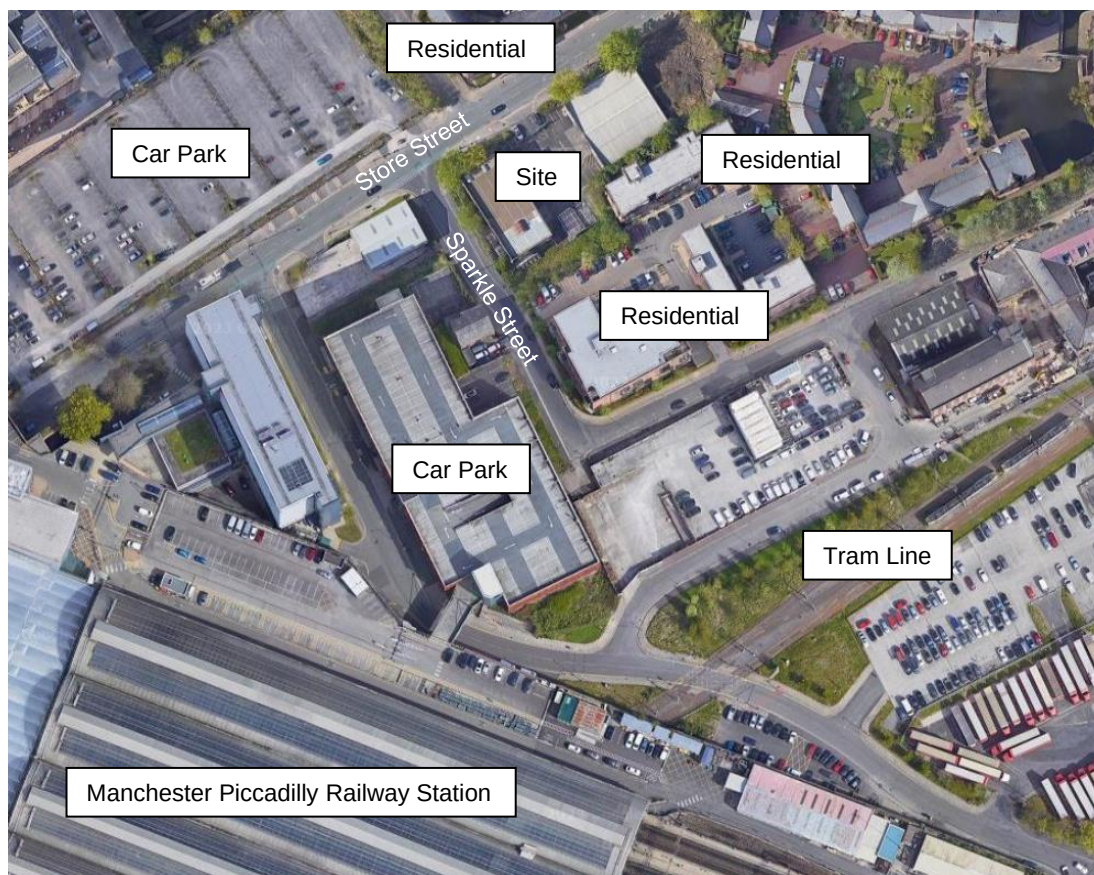
2. INTRODUCTION

- 2.1 The assessment has been carried out in accordance with relevant local and national planning guidance.
- 2.2 The aims of the assessment were:
- To establish the suitability of existing noise and vibration levels at the site for the proposed development;
 - Where required, identify appropriate measures to optimise the acoustic design of the development and achieve acceptable noise and vibration levels in habitable areas;
 - To establish appropriate noise limits for noise emissions from mechanical plant associated with the development at the positions of existing sensitive receptors in the area.
- 2.3 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

3. PROJECT DESCRIPTION

- 3.1 The site is located in a mixed-use area bounded by Store Street to the north and Sparkle Street to the west. Approximately 100 metres south is Manchester Piccadilly Railway Station and 100 metres southeast is a tram line.
- 3.2 The site is largely unoccupied, with its former use being a telephone exchange along with surface car parking and two buildings that are partly used for storage and distribution. The buildings are screened from the road on two sides by existing vegetation, vacant land to the east and residential apartments to the south. Several ground floor level car parks and a multi-storey car park are located within close proximity of the site. An access route for vehicles is provided from Store Street.
- 3.3 The site location is shown in Figure 1 below.

Figure 1 Site Location and Surrounding Area



- 3.4 The proposal is for the demolition of the existing low rise commercial units and erection of a ground plus 27 storey residential development with supporting residential amenity, private terraces and private shared garden. A current drawing of the proposed development layout is shown in Appendix 1.

4. PLANNING POLICY

National Policy

- 4.1 Outline guidance for the assessment of noise affecting new developments is given in the National Planning Policy Framework (NPPF). Relevant sections in this case are highlighted below:

180. 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 of ...noise pollution.

191. 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 impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

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.

Local Policy

- 4.2 Manchester City Council's (MCC) Core Strategy Development Plan Document 2012-2027 (adopted July 2012) provides outline guidance on the assessment of noise and vibration affecting new development in the borough.

- 4.3 Policy DM1 Development Management states:

All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:-

- Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.*

- 4.4 In addition, policies DC26.1 – DC26.6 of the MCC's Unitary Development Plan (UDP) are relevant to noise and vibration. These are as follows:

DC26.1 The Council intends to use the development control process to reduce the impact of noise on people living and working in, or visiting, the City...

DC26.2 New noise-sensitive developments (including large-scale changes of use of existing land or buildings), such as housing, schools, hospitals or similar activities, will be permitted subject to their not being in locations which would expose them to high noise levels from existing uses or operations, unless the effects of the noise can realistically be reduced. In giving effect to this policy, the Council will take account both of noise exposure at the time of receiving a planning application and of any increase that may reasonably be expected in the foreseeable future.

DC26.3 Developments likely to result in unacceptably high levels of noises will not be permitted:

- a. in residential areas;*
- b. near schools, hospitals, nursing homes and similar institutions;*
- c. near open land used frequently for recreational purposes.*

DC26.4 Where the Council believes that an existing noise source might result in an adverse impact upon a proposed new development, or where a new proposal might generate potentially unacceptable levels of noise, it will in either case require the applicant to provide an assessment of the likely impact and of the measures he proposes to deal satisfactorily with it....

DC26.5 The Council will control noise levels by requiring, where necessary, high levels of noise insulation in new development as well as noise barriers where this is appropriate.

DC26.6 Exceptions to the general policy will be considered on their merits. The Council accept, as an example, that the occasional use of outdoor facilities such as sports stadia for concerts can be acceptable in certain circumstances. Any such proposal will be considered in the light of consultation with local residents and others, and the practicability of appropriate conditions on any approval.

- 4.5 In addition, Manchester City Council's Planning and Noise, Technical Guidance issued in October 2022 restates policy DM1 and policies DC26.1 – DC26.6.
- 4.6 To address the requirements of the national and local policies, the following key acoustic matters have been assessed:
 - Noise affecting the habitable areas of the proposed development;
 - Ground-borne vibration affecting the habitable areas of the proposed development;
 - Noise emissions from mechanical plant associated with the development at the position of existing sensitive receptors in the area.

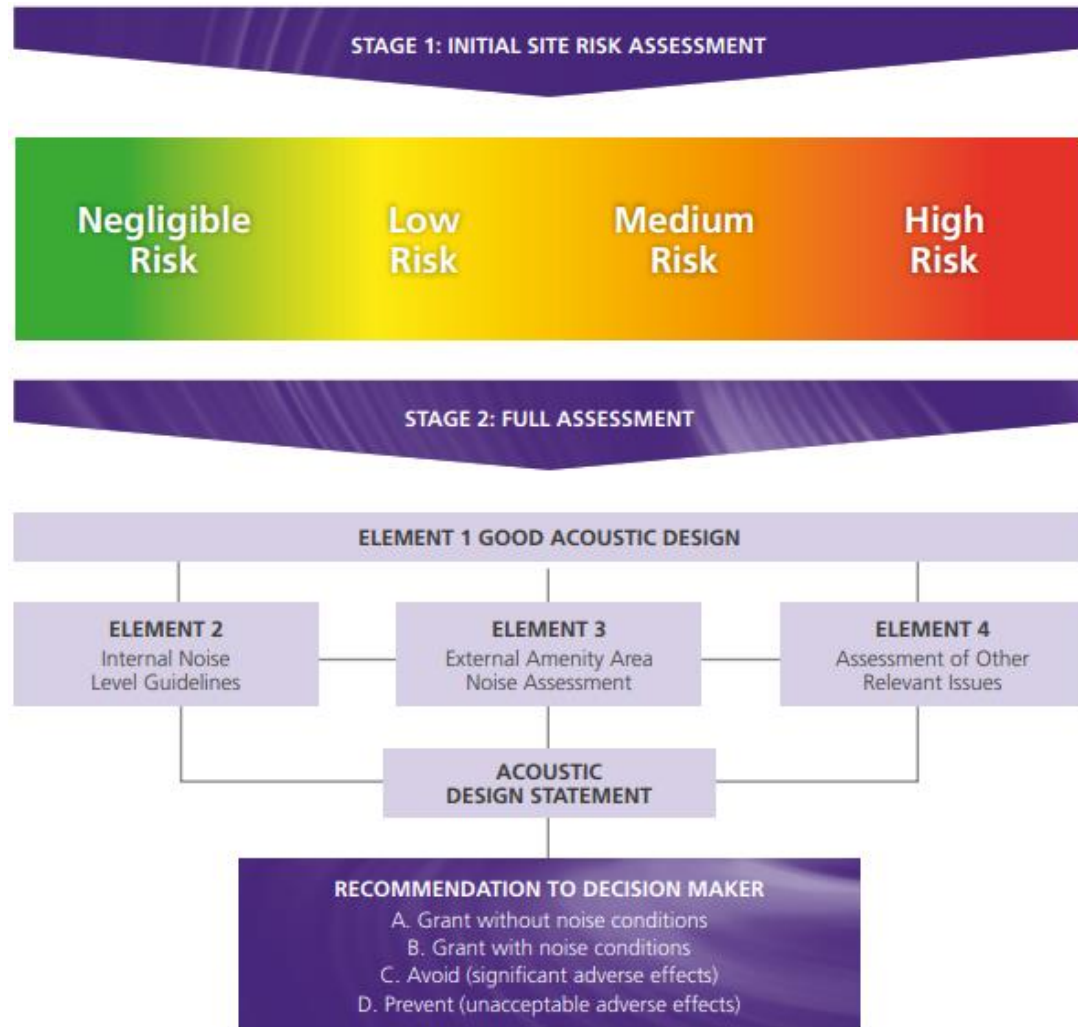
5. NOISE AFFECTING THE DEVELOPMENT

5.1 Specific guidance on the assessment of noise affecting new residential development is given in ProPG: Planning and Noise for New Residential Development, May 2017 (ProPG). The process within the ProPG guidance for the appraisal of noise levels affecting new residential development is considered to be current 'best practice' and has, therefore, been followed for the assessment. The assessment process can be summarised as follows:

- Stage 1 – measure noise levels at the site and carry out an initial noise risk assessment of the proposed development site based on the measured levels.
- Stage 2 – where a higher noise risk is identified, carry out a detailed assessment including the following four considerations:
 - Element 1 – the overall acoustic design and layout of the site
 - Element 2 – internal noise levels in habitable areas
 - Element 3 – noise levels in external amenity areas
 - Element 4 – consideration of other relevant issues
- Based on the results of the Stage 2 assessment, provide a recommendation to the decision maker on whether planning permission can and should be granted.

5.2 The process is shown visually in Figure 2 below

Figure 2 ProPG Assessment Process



- 5.3 It should be noted that the guidance in ProPG relates primarily to noise from transportation sources, i.e. road traffic, aircraft, rail etc. Any significant noise from other sources (e.g. industrial, commercial or entertainment sources) is outside the scope of the ProPG guidance and, therefore, requires separate consideration.

Stage 1 – Noise survey and initial assessment

- 5.4 A noise survey was carried out at the site from 2nd May to 10th May 2023 to assess existing noise levels in the area. The full methodology and results of the noise survey are provided in Appendix 2.
- 5.5 Average (LAeq) and maximum (LAm_{ax}) noise levels across the site were generally dictated by road traffic on Store Street and, to a lesser extent, Sparkle Street.

- 5.6 Background noise levels (LA90) across the site were dictated by constant road traffic noise from surrounding roads.
- 5.7 Areas of the development at the northern edge of the site will be subject to the highest noise levels due to road traffic on Store Street. The noise survey results show that noise levels at this position are as follows:
- Average noise levels during the daytime - 65 dB LAeq,0700-2300hrs;
 - Average noise levels during the night-time - 62 dB LAeq,2300-0700hrs;
 - Typical maximum noise levels during the night-time - 78 dB LMax.
- 5.8 Based on the results of the site noise survey, a 3D computer noise model was developed to predict and assess the noise levels that will exist across the entire development.
- 5.9 The 3D noise model was developed using Cadna/A v2023 environmental noise modelling software. Cadna/A incorporates the calculation methodology outlined in the Department of Transport Welsh Office - *Calculation of Road Traffic Noise* (CRTN) for the assessment of road traffic noise propagation and CRN for rail noise.
- 5.10 The layout of the development and surrounding area was input into the model. To calculate the spread of noise levels around the site, day-time average noise levels were input for the surrounding sources (e.g. Store Street, Sparkle Street, tram and railway) and calibrated to the results of the on-site noise measurements.
- 5.11 The methodology and results of the noise modelling are provided in Appendix 3. It can be seen from the modelling results that noise levels will be highest on facades of the development facing Store Street and lowest on south eastern facing facades overlooking existing residential.
- 5.12 The measured noise levels can be compared with Figure 3 below to assess the 'noise risk' of the site. Where the noise risk is high, significant acoustic design measures may be required to achieve acceptable noise levels in the development. Where the noise risk is low, acceptable noise levels may be achievable with no specific acoustic design measures.

Figure 3 Noise Risk Assessment (Adaption of Figure 1 from ProPG)



- 5.13 It can be seen from a comparison of the measured noise levels in paragraph 5.7 above with Figure 3 that the site is 'Medium' risk in relation to daytime noise levels and 'High' risk in relation to night-time noise levels. Therefore, ProPG requires that a more detailed 'Stage 2' assessment is carried out.

Stage 2 – Element 1 – Overall acoustic design of the site

- 5.14 The overall design of the development has been reviewed in relation to the measured noise levels at the site. In this case, improving the sound insulation of the facades would offer potential improvements to the acoustic design of the development.
- 5.15 The treatment of the facades with noise mitigation is an acceptable approach. It is in line with current planning guidance, where the efficient use of land and the need for housing is a priority. The detailed design of the facades is discussed further below.

Stage 2 – Element 2 - Internal noise levels

- 5.16 Appropriate design criteria for acceptable noise levels in acoustically sensitive areas of new developments are given in BS8233:2014 '*Guidance on sound insulation and noise reduction for buildings*'.
- 5.17 Relevant BS8233 design criteria are summarised in Table 1 below.

Table 1 BS8233:2014 Internal Noise Criteria

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq,16hour	-
Dining	Dining room/area	40 dB LAeq,16hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16hour	30 dB LAeq,8hour

- 5.18 It is also considered appropriate in this case to assess the potential impact of noise emissions from individual noise events on the bedrooms of the development during the night-time. This is in line with guidance given in BS8233:2014 and ProPG, which both point out that regular individual noise events during the night have the potential to cause sleep disturbance.
- 5.19 Appropriate design criteria for acceptable maximum noise levels in habitable rooms of new residential developments are given in the ProPG guidance, which states that "*In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB LAmax,F more than 10 times a night.*"
- 5.20 Therefore, the following acoustic design criteria have been adopted for the development:
- Average noise levels in living rooms and dining rooms during the day should not exceed 35 dB LAeq,0700-2300hrs and 40 dB LAeq,0700-2300hrs respectively;
 - Average noise levels in bedrooms should not exceed 35 dB LAeq,0700-2300hrs during the day and 30 dB LAeq,2300-0700hrs during the night;
 - Maximum noise levels should not regularly exceed 45 dB LAmax in bedrooms during the night.
- 5.21 Full construction details for the development have not been finalised as the project is at an early design stage. It has therefore been assumed that the external walls of the development will be

constructed using a standard masonry construction (e.g. 102mm brick, 100mm insulated cavity, 100mm concrete block) or a light-weight construction designed to achieve a similar level of sound insulation (this is technically achievable subject to detailed design). Consequently, internal noise levels would be dictated by external noise ingress via glazing and ventilators.

- 5.22 Background ventilation for the development will be provided by mechanical ventilation with heat recovery (MVHR) systems with no direct penetrations in the facade for ventilation into habitable rooms.
- 5.23 Calculations were carried out using facade modelling software in accordance with the methodology given in BS8233:2014 to calculate the sound insulation performance required of the glazing and ventilation to achieve the nominated internal noise criteria in the 'worst-case' habitable rooms of the development (i.e. the habitable rooms that will be subject to the highest external noise levels).
- 5.24 If acceptable internal noise levels can be achieved in 'worst case' habitable rooms then it follows that acceptable internal noise levels can be achieved in all other habitable rooms of the development using similar glazing and ventilator types.
- 5.25 The calculations were carried out based on the dimensions/details for facade elements taken from project drawings.
- 5.26 The results of the calculations are shown in Appendix 4 and are summarised in Table 2 below.

Table 2 Acoustic Requirements for 'Worst Case' Habitable Rooms

Reference	Bedrooms		Living rooms/Dining rooms	
	Glazing Performance Requirements (inc. Frames)	Ventilator Performance Requirements (in Open Position)	Glazing Performance Requirements (inc. Frames)	Ventilator Performance Requirements (in Open Position)
FS01	36 dB Rw+Ctr	MVHR	30 dB Rw+Ctr	MVHR
FS02	30 dB Rw+Ctr		27 dB Rw+Ctr	
FS03	27 dB Rw+Ctr		27 dB Rw+Ctr	

Note The requirements given are approximate only and should be confirmed at the detailed design stage when full design details are available.

- 5.27 The required sound insulation performance values in Table 2 could typically be achieved by the glazing types shown in Table 3.

Table 3 Typical Glazing Acoustic Performances

Glazing (in Good Quality Sealed Frames)	Typical Weighted Sound Reduction (Rw + Ctr)
4/16/4mm standard thermal double glazing	27

6/16/6.4mm thermal double glazing	30
10mm/16/8.8mm acoustically upgraded thermal double glazing	36
Note The acoustic performance of the glazing systems (including frames) should always be confirmed with the manufacturer before selection for installation on site	

- 5.28 Based on the results of the calculations summarised in Table 2 and the measured noise levels at the site (considering both the day and night-time average and maximum noise levels), an outline specification has been developed showing the sound insulation performance requirements for all facades of the development. The outline facade specification is shown in Appendix 5
- 5.29 It can be seen from the above that acceptable internal noise levels will be achievable in the development subject to the specification of suitable glazing and ventilation systems at the detailed design stage (which could be secured with a suitable planning condition). It is our view therefore that the proposed development is, in principle, acceptable with regards to the noise levels that will exist within the habitable rooms.
- 5.30 The above ProPG assessment for planning purposes is based on internal noise levels with windows closed (assumed to be “normal” circumstances). The ventilation strategy for the development is to allow for boosted mechanical ventilation to offset overheating, therefore windows would not need to be opened to offset overheating within the apartments.

Stage 2 – Element 3 – Noise levels in external amenity areas

- 5.31 BS8233 states that it is desirable that noise levels in external amenity areas of residential developments do not exceed 50 dB LAeq and that 55 dB LAeq,T should be regarded as an upper guideline value. However, BS8233 recognises that these guideline values will not always be achievable in city centres or urban areas adjoining main roads or other transport sources. In these cases, BS8233 states that the development should be designed to achieve the lowest practicable noise levels in the amenity spaces.
- 5.32 The noise survey results indicate that noise levels in external amenity areas (terraces on the first floor and shared gardens on the 10th floor) are predicted to achieve the BS8233 recommended levels. The proposed development is therefore also considered to be acceptable based on noise levels in external amenity areas.

Stage 2 – Element 4 – Other relevant issues

- 5.33 In our view the design and acoustic approach outlined above is in line with both local and national noise policy. It is common for residential properties to be situated near to busy roads and railway lines and this is an acceptable scenario provided that the properties are acoustically upgraded where necessary to achieve acceptable noise levels in habitable areas.

Recommendation to decision maker

- 5.34 It is our view that planning permission should be granted in relation to noise affecting habitable areas of the development subject to the imposition of suitable planning conditions to ensure that acceptable noise levels are achieved in the finished development.

6. GROUND-BORNE VIBRATION AFFECTING THE DEVELOPMENT

- 6.1 The vibration levels that will exist within the habitable areas of the finished development have been assessed based on the existing ground-borne vibration levels at the site.

Design criteria – Ground-borne vibration and noise

- 6.2 Appropriate criteria for ground-borne vibration affecting residential dwellings are given in BS 6472-1:2008 '*Guide to evaluation of human exposure to vibration in buildings - Part 1: Vibration sources other than blasting*'. The criteria in BS6472-1 are provided as Vibration Dose Values, as summarised in Table 4.

Table 4 BS6472-1:2008 Vibration Criteria

Place	Low Probability of Adverse Comment (VDV) $\text{m}\cdot\text{s}^{-1.75\ 1}$	Adverse Comment Possible (VDV) $\text{m}\cdot\text{s}^{-1.75}$	Adverse Comment Probable (VDV) $\text{m}\cdot\text{s}^{-1.75\ 2}$
Residential buildings 16 h day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 h night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

- 6.3 It is also important to assess reradiated noise levels within the habitable rooms of the finished resulting from ground-borne vibration (referred to as 'ground-borne noise' for the remainder of this report). There is currently no official Government or national guidance for assessing ground-borne noise levels affecting residential developments. As a result, criteria based on guidelines published by the American Public Transit Association (APTA) are widely used in the UK. These criteria are reproduced in Table 5.

Table 5 APTA Guidelines for Ground-Borne Noise Inside Residential Dwellings

Community Area	Maximum A-weighted sound pressure level, dB LASmax	
	Single Family Dwelling	Multi-Family Dwelling
Low Density Residential	30	35
Average Density Residential	35	40
High Density Residential	35	40
Commercial	40	45
Industrial / Highway	40	45

- 6.4 Measured ground-borne vibration and noise levels at the site have been assessed against the criteria shown in Table 4 and Table 5.

Existing ground-borne vibration levels

- 6.5 Ground-borne vibration and noise measurements were carried out as part of the site survey. The methodology and results of the measurements are outlined in Appendix 2.
- 6.6 It is important to note that the nearby train line is elevated and positioned approximately 100m south of the site. The measurements shown in Appendix 2 are therefore more likely to be a result of heavy vehicle passes on the adjacent roads than train passes.
- 6.7 Tri-axial Vibration Dose Value (VDV) measurements were taken across the low-frequency range (1-80Hz) and logged at 10 second intervals for 30 minutes, to ensure an adequate quantity of train movements were recorded. Timetables indicate that up to 47 trains arrived/departed the station during the survey period.
- 6.8 Using the measured VDV levels during the survey, the total day and night-time VDV levels have been calculated based on the total number of train passes that occur on the railway during the daytime and night-time. The extrapolated VDV levels are summarised below in Table 6:

Table 6 Vibration Data Summary (Vibration Dose Values)

Period	X Axis ($\text{m}\cdot\text{s}^{-1.75}$) Wd	Y Axis ($\text{m}\cdot\text{s}^{-1.75}$) Wd	Z Axis ($\text{m}\cdot\text{s}^{-1.75}$) Wb
Daytime (0700-2300)	0.005	0.004	0.013
Night-time (2300-0700)	0.004	0.004	0.011

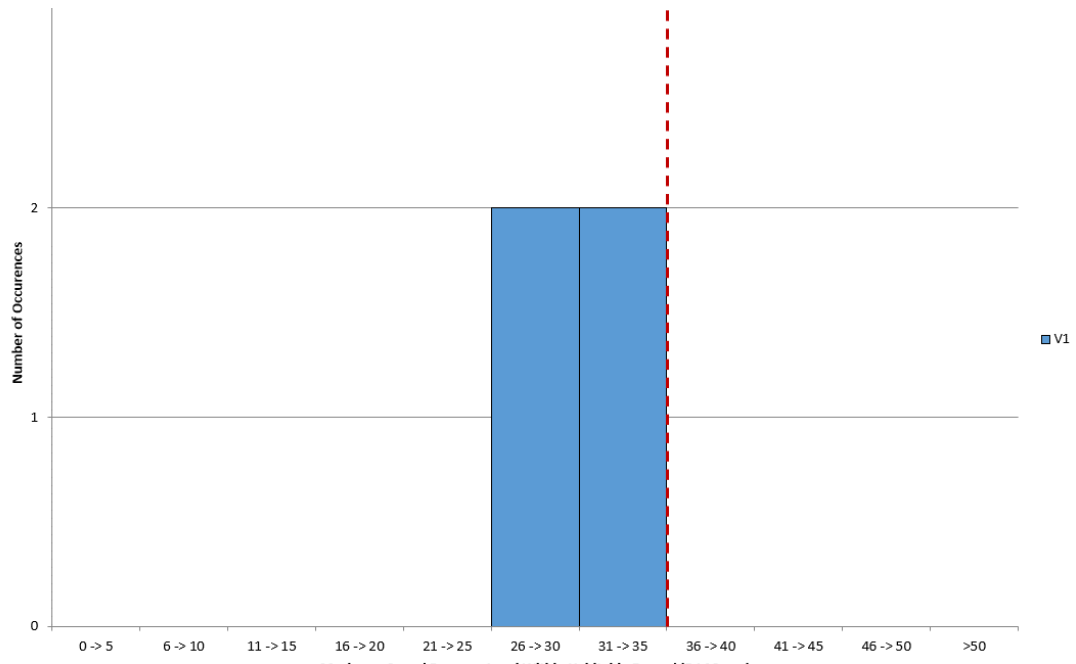
- 6.9 Vibration levels were highest in the vertical z-axis (compared to the X and Y axes).
- 6.10 It can be seen from a comparison of Table 4 and Table 6 that vibration levels at the site fall well below the “*Low probability of adverse comment*” rating for both day- and night-time periods according to BS6472:1992.
- 6.11 The results of the BS6472 assessment are in line with subjective opinion formed during the survey that there are insignificant ground-borne vibration levels at the site.
- 6.12 It is subsequently reasonable to conclude that levels of vibration at the site are acceptable for the proposed development.

Existing ground-borne noise levels

- 6.13 Vibration measurements were also taken in the x, y and z-axis in 1/3 octave frequency bands in the audible range (20Hz-16KHz) in order to inform an assessment of ground-borne noise.
- 6.14 In the absence of any official local or national Governmental assessment guidance, the measured ground-borne noise levels were used to calculate the resultant LASmax noise levels in the ‘worst case’ habitable rooms of the development in accordance with the Association of Noise Consultants (ANC) Guidelines – “*Measurement & Assessment of Groundborne Noise & Vibration*”.

- 6.15 The ANC Guideline document gives correction values for factors affecting the propagation of structure-borne vibration within buildings such as attenuation with storey height. We have assessed at ground floor level therefore no corrections have been applied to the results which are summarised in Figure 4 below.

Figure 4 Predicted Ground-borne Noise Levels (LASmax)



- 6.16 It can be seen from Figure 4 above that the predicted levels are 25-35 dB LASmax and therefore compliant with APTA Guidelines for all categories under multi-family dwelling. As discussed in paragraph 6.6, these results are likely due to heavy vehicle passes rather than train passes and, in our view, the predicted levels are acceptable.
- 6.17 In summary, it can be seen from the above that the criterion for reradiated noise is predicted to be achieved in the 'worst-case' dwellings with no additional mitigation measures.

7. PLANT NOISE IMPACT ASSESSMENT

Design criteria – Mechanical plant noise

7.1 BS4142:2014+A1:2019 – *Methods for rating and assessing industrial and commercial sound* (hereafter BS4142) can be used to assess the impact of noise from external industrial and/or commercial noise sources on nearby sensitive receptors.

7.2 The BS4142 assessment methodology can be summarised as follows:

1. Measure the existing background noise levels (LA90,T dB) at the locations of nearby noise sensitive receptors during the quietest periods when the noise source(s) under investigation will operate;
2. Predict or measure the noise emissions (LAeq,T dB) from the noise source(s) under investigation at the location(s) of the nearby sensitive receptors, and add corrections for any distinguishable acoustic features (e.g. tones, whines, screeches, hisses etc);
3. Subtract the measured background noise levels (item 1 above) with the measured or predicted rating noise levels (item 2 above) at each sensitive receptor. BS4142 states that:

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

NOTE Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

7.3 It is understood that Manchester City Council consider “background -5 dB” to be an appropriate criterion for noise emissions from new developments within their borough. These criteria have been adopted for the assessment of noise emissions from the development.

7.4 Background noise levels (LA90) at the site were measured as part of the site noise survey outlined in Appendix 2. The measured background noise levels have been used to develop limits for plant noise emissions from the new development at the positions of the surrounding residential properties in accordance with the BS4142 assessment methodology. The limits are shown in Table 7 below.

Table 7 BS4142 Noise Limits - Free-field Levels

Location	Period	
	Day-time/Evening (0700-2300hrs)	Night-time (2300-0700hrs)
Nearest noise sensitive receptor	49 dB L _A r,Tr	37 dB L _A r,Tr

Note 1 The above limits are 'rated' noise levels. Any mechanical plant noise emissions should have appropriate corrections for the character of the noise applied and still meet these limits.

Proposed mechanical plant design

- 7.5 Detailed design information is not yet available for external mechanical plant for the development, and therefore noise emissions from external mechanical plant cannot be accurately predicted at the positions of nearby residential properties at this stage.
- 7.6 The selection and design of external mechanical plant will be reviewed as project information becomes available to ensure that the project BS4142:2014 noise limits given in Table 7 are achieved.
- 7.7 Compliance with the limits could be secured through the imposition of a suitable planning condition if deemed necessary by the Local Planning Authority.

8. CONCLUSIONS

- 8.1 Cass Allen has been instructed by Foras (Sparkle Street) Ltd to assess the noise and vibration impact of a proposed new development at Sparkle Street in Manchester.
- 8.2 Noise affecting the development has been assessed in accordance with the ProPG guidance. The design of the development is considered to be acceptable subject to the adoption of acoustically upgraded glazing and ventilation. This can be investigated further at the detailed design stage.
- 8.3 Ground-borne noise and vibration levels at the site have been measured and are considered to be acceptable for the development.
- 8.4 Appropriate limits for noise from mechanical plant have been calculated based on measured noise levels at the site and guidance given in BS4142. This will be investigated further at the detailed design stage.
- 8.5 It is our view that the site is suitable for the development in terms of noise and vibration levels and that planning permission should be granted subject to the imposition of suitable planning conditions.

Appendix 1 Development Layout



Appendix 2 Survey Results

Survey Summary:

The survey comprised short-term operator attended noise and vibration measurements and longer-term unattended noise monitoring at the site. Noise levels at the site were generally dictated by road traffic on surrounding roads. Vibration levels at the site were very low.

Survey Period:

02/05/2023 to 10/05/2023

Survey Objectives:

- To identify noise and vibration sources that contribute to ambient noise levels at the site;
- To measure noise and vibration levels around the site over a typical day and night-time period.

Equipment Used:

Type	Manufacturer	Model	Serial Number
Sound level meter ¹ (noise logger)	Rion	NL-32	01182950
Sound level meter ¹ (noise logger)	Rion	NL-32	00903342
Calibrator	Rion	NC-74	34551703
Sound level meter ¹	Rion	NL-52	00965090
Accelerometer	Rion	PV-57A	50472
4 Channel Data Logger	Rion	DA-21	00360369
Accelerometer (attached to DA-20)	Rion	PV-57I	53045 (X axis)
Accelerometer (attached to DA-20)	Rion	PV-57I	53046 (Y axis)
Accelerometer (attached to DA-20)	Rion	PV-57I	53105 (Z axis)
Tri-Axial Vibration Meter	Rion	XV-2P	00380055
Tri-axial accelerometer	Rion	PV-83C	73649

Note 1: All sound level meters were calibrated before and after measurement periods and no significant drift in calibration was found to have occurred. The results of the measurements are therefore considered to be representative.

Weather Conditions:

The observed weather conditions were acceptable for acoustic measurement throughout the attended survey periods (low-medium wind speeds and no rain). Weather records for the area confirmed that weather conditions were also generally acceptable for acoustic measurement during the unattended monitoring.

Measurement Positions:

Position (refer plan below)	Description
N1	Attended noise monitoring position. 1.5m above roof level, approx. 12m above ground. Free-field. Direct line of sight to railway station and tracks.
N2	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to Store Street.
L1	Unattended noise logging position. 2m above ground level. Free-field. Direct line of sight to Store Street.
L2	Unattended noise logging position. 3m above ground level of Sparkle Street (site sits 2m below ground level of Sparkle Street). Free-field. Direct line of sight to Sparkle Street.
V1	Unattended ground-borne vibration monitoring position. The vibration measurements were taken on top of the existing concrete foundations.
V2	

Site Plan showing Measurement Positions:**Attended Noise Monitoring Results:**

Date	Position	Time	Meas. Length	LAeq, dB	LAmix, dB	LA90, dB	Observations
02/05/2023	N1	16:59	25 secs	58	61	57	Noise dictated by distant train arriving and announcements.
		17:00	5 mins	55	62	51	Noise dictated by distant trains arriving, leaving, idle engines in the station, announcements, tonal
		17:05		53	60	52	

Attended Noise Monitoring Results:

Date	Position	Time	Meas. Length	LAeq, dB	LAmix, dB	LA90, dB	Observations
	N2	17:10		56	61	53	plant, breaks squeaking when train approaches the station. Female announcement quieter than male.
		17:20		66	80	57	Noise dictated by road traffic on Store Street.
		17:25	9 secs	71	75	62	
		17:25	7 secs	71	74	68	
		17:25	12 secs	63	73	55	

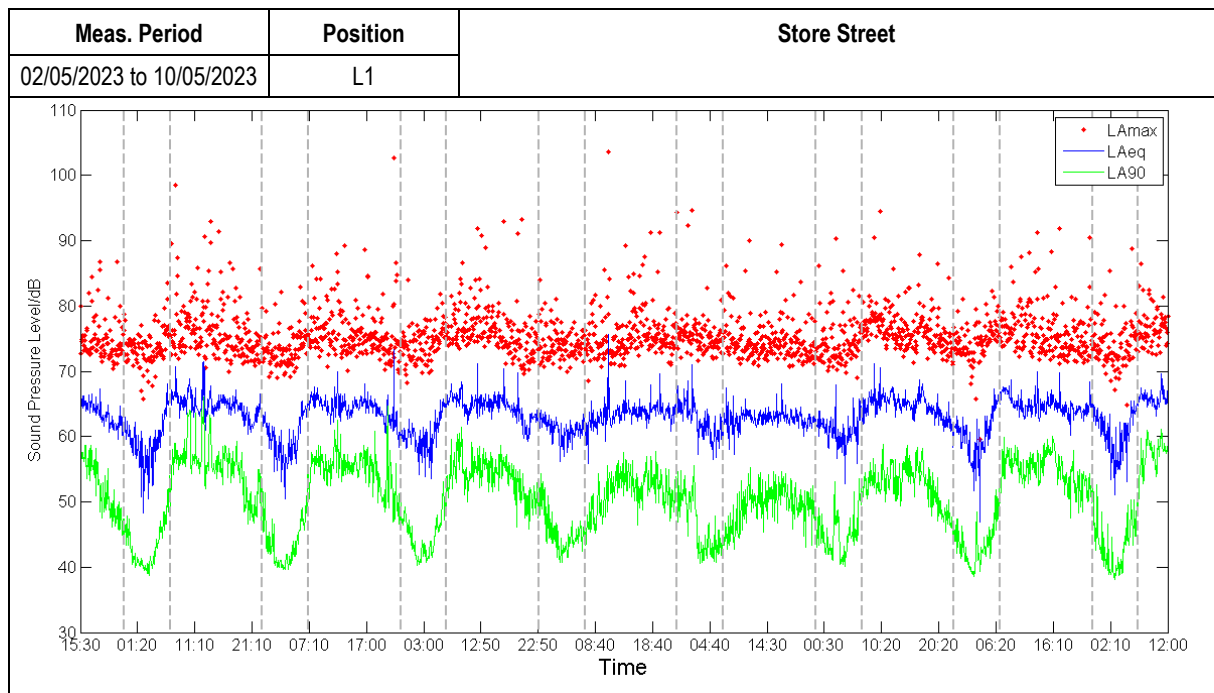
Unattended Noise Monitoring Results:

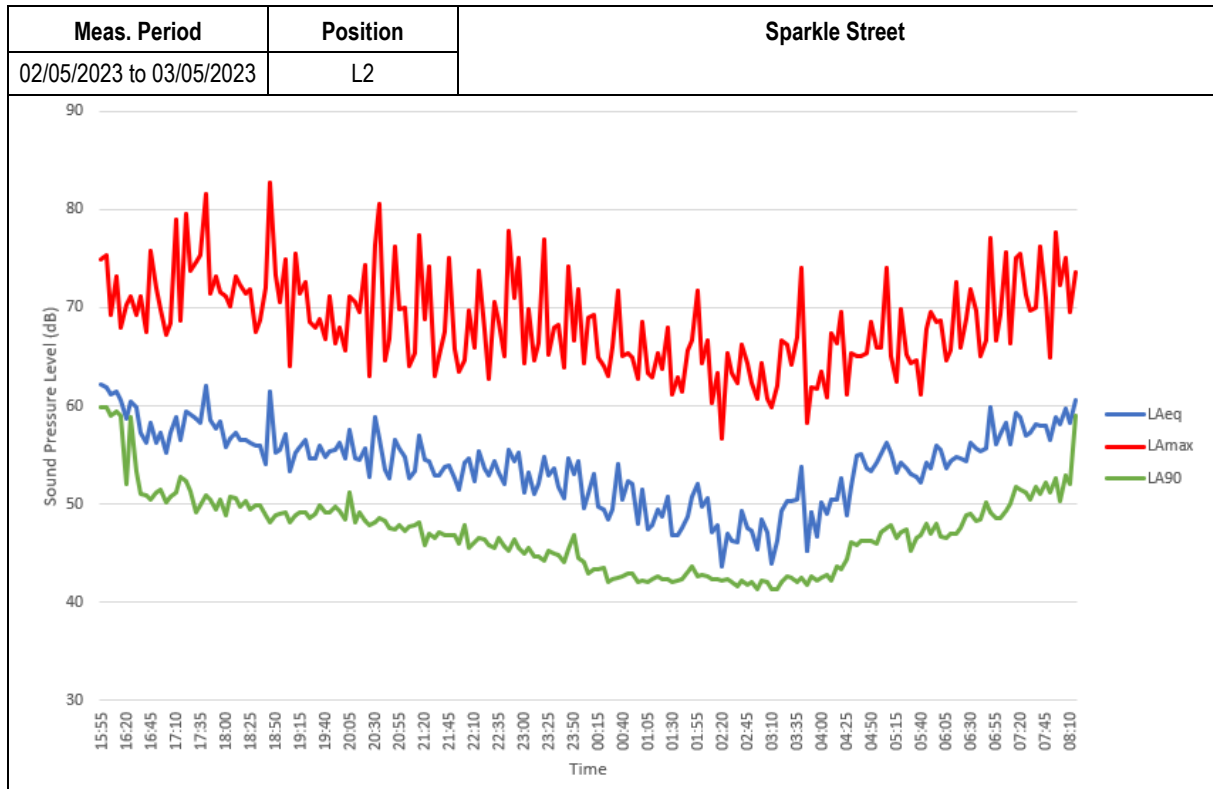
Meas. Period	Position	Daytime (0700-2300hrs)		Night-time (2300-0700hrs)		
		LAeq,16hr, dB	LA90,1hr dB ¹	LAeq,8hr, dB	LA90,5mins, dB ¹	LAmix, dB ²
02/05/2023 to 10/05/2023	L1	65	54	62	42	78
02/05/2023 to 03/05/2023	L2	57	51	52	42	72

Note 1: Typical lowest measured during the period shown.

Note 2: Highest typical maximum noise level during the night-time (not exceeded more than 10-15 times per night).

Unattended Noise Monitoring Results:





Unattended Ground-borne Vibration Monitoring Results:

Date	Position	Time	Meas. Length	X VDV	Y VDV	Z VDV
02/05/2023	V1	16:50:02	10 secs	0.00014	0.00017	0.00079
		16:50:12		0.00020	0.00023	0.00068
		16:50:22		0.00020	0.00022	0.00082
		16:50:32		0.00019	0.00024	0.00070
		16:50:42		0.00019	0.00020	0.00098
		16:50:52		0.00016	0.00016	0.00084
		16:51:02		0.00061	0.00068	0.00065
		16:51:12		0.00017	0.00015	0.00068
		16:51:22		0.00022	0.00020	0.00067
		16:51:32		0.00019	0.00018	0.00081
		16:51:42		0.00018	0.00021	0.00068
		16:51:52		0.00011	0.00012	0.00091
		16:52:02		0.00014	0.00016	0.00078
		16:52:12		0.00013	0.00012	0.00073
		16:52:22		0.00020	0.00017	0.00067
		16:52:32		0.00015	0.00018	0.00066
		16:52:42		0.00016	0.00015	0.00061
		16:52:52		0.00028	0.00028	0.00145

Date	Position	Time	Meas. Length	X VDV	Y VDV	Z VDV
		16:53:02		0.00023	0.00022	0.00109
		16:53:12		0.00015	0.00013	0.00073
		16:53:22		0.00018	0.00022	0.00056
		16:53:32		0.00012	0.00016	0.00073
		16:53:42		0.00015	0.00014	0.00077
		16:53:52		0.00036	0.00037	0.00068
		16:54:02		0.00047	0.00048	0.00087
		16:54:12		0.00018	0.00019	0.00082
		16:54:22		0.00019	0.00021	0.00070
		16:54:32		0.00024	0.00025	0.00074
		16:54:42		0.00028	0.00032	0.00074
		16:54:52		0.00020	0.00020	0.00065
		16:55:02		0.00019	0.00020	0.00074
		16:55:12		0.00015	0.00012	0.00050
		16:55:22		0.00015	0.00015	0.00068
		16:55:32		0.00020	0.00024	0.00068
		16:55:42		0.00020	0.00020	0.00077
		16:55:52		0.00019	0.00021	0.00076
		16:56:02		0.00023	0.00024	0.00094
		16:56:12		0.00020	0.00021	0.00068
		16:56:22		0.00020	0.00019	0.00054
		16:56:32		0.00017	0.00017	0.00063
		16:56:42		0.00018	0.00019	0.00058
		16:56:52		0.00019	0.00019	0.00048
		16:57:02		0.00037	0.00032	0.00058
		16:57:12		0.00018	0.00018	0.00063
		16:57:22		0.00017	0.00016	0.00044
		16:57:32		0.00016	0.00013	0.00073
		16:57:42		0.00015	0.00014	0.00056
		16:57:52		0.00017	0.00015	0.00063
		16:58:02		0.00014	0.00014	0.00067
		16:58:12		0.00015	0.00015	0.00086
		16:58:22		0.00017	0.00022	0.00079
		16:58:32		0.00021	0.00022	0.00101
		16:58:42		0.00020	0.00021	0.00086
		16:58:52		0.00047	0.00041	0.00075

Date	Position	Time	Meas. Length	X VDV	Y VDV	Z VDV
		16:59:02		0.00033	0.00032	0.00114
		16:59:12		0.00024	0.00023	0.00150
		16:59:22		0.00027	0.00027	0.00102
		16:59:32		0.00014	0.00021	0.00129
		16:59:42		0.00024	0.00025	0.00066
		16:59:52		0.00023	0.00023	0.00067
		17:00:02		0.00026	0.00026	0.00058
		17:00:12		0.00010	0.00011	0.00058
		17:00:22		0.00019	0.00018	0.00082
		17:00:32		0.00011	0.00010	0.00066
		17:00:42		0.00017	0.00014	0.00057
		17:00:52		0.00016	0.00015	0.00049
		17:01:02		0.00026	0.00026	0.00062
		17:01:12		0.00019	0.00016	0.00126
		17:01:22		0.00022	0.00019	0.00083
		17:01:32		0.00019	0.00020	0.00094
		17:01:42		0.00017	0.00017	0.00082
		17:01:52		0.00022	0.00021	0.00084
		17:02:02		0.00028	0.00027	0.00126
		17:02:12		0.00016	0.00018	0.00172
		17:02:22		0.00020	0.00019	0.00066
		17:02:32		0.00016	0.00022	0.00042
		17:02:42		0.00011	0.00012	0.00040
		17:02:52		0.00020	0.00018	0.00055
		17:03:02		0.00012	0.00015	0.00087
		17:03:12		0.00027	0.00026	0.00081
		17:03:22		0.00019	0.00022	0.00097
		17:03:32		0.00017	0.00020	0.00093
		17:03:42		0.00065	0.00062	0.00078
		17:03:52		0.00020	0.00019	0.00057
		17:04:02		0.00022	0.00017	0.00081
		17:04:12		0.00021	0.00022	0.00088
		17:04:22		0.00019	0.00021	0.00079
		17:04:32		0.00021	0.00023	0.00066
		17:04:42		0.00022	0.00018	0.00072
		17:04:52		0.00014	0.00011	0.00043

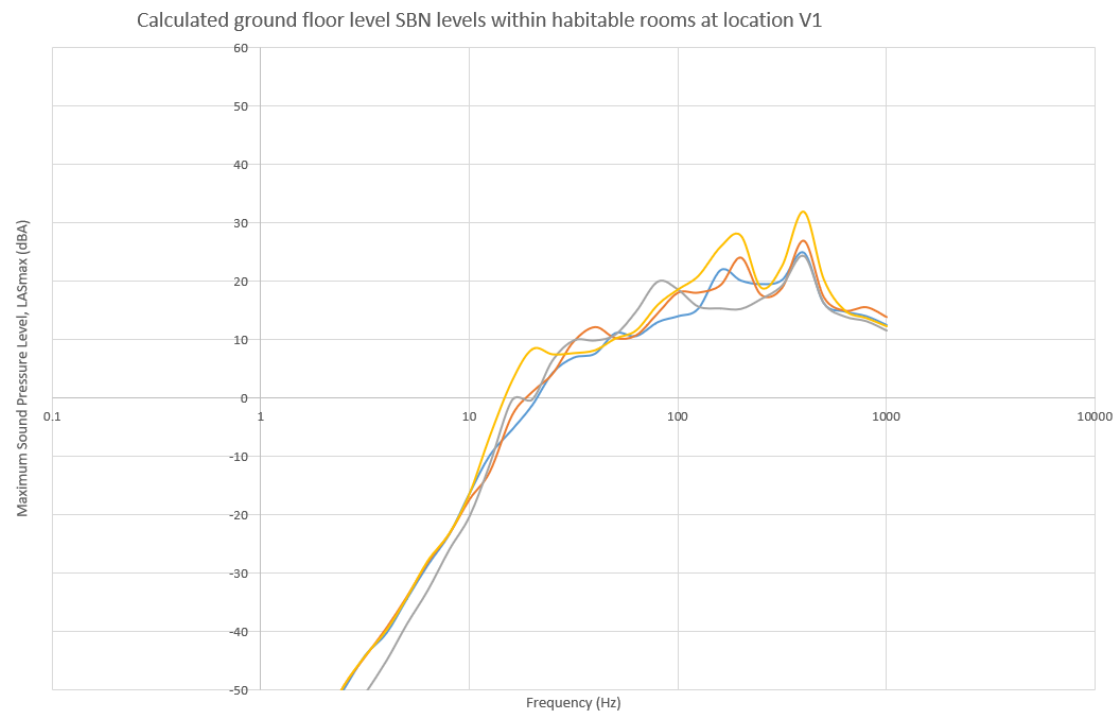
Date	Position	Time	Meas. Length	X VDV	Y VDV	Z VDV
		17:05:02		0.00016	0.00017	0.00066
		17:05:12		0.00019	0.00022	0.00072
		17:05:22		0.00027	0.00027	0.00069
		17:05:32		0.00022	0.00021	0.00056
		17:05:42		0.00019	0.00017	0.00057
		17:05:52		0.00021	0.00023	0.00068
		17:06:02		0.00018	0.00020	0.00065
		17:06:12		0.00030	0.00029	0.00063
		17:06:22		0.00042	0.00045	0.00080
		17:06:32		0.00021	0.00020	0.00115
		17:06:42		0.00020	0.00024	0.00085
		17:06:52		0.00021	0.00025	0.00057
		17:07:02		0.00021	0.00024	0.00095
		17:07:12		0.00018	0.00024	0.00087
		17:07:22		0.00086	0.00085	0.00083
		17:07:32		0.00018	0.00021	0.00111
		17:07:42		0.00020	0.00018	0.00149
		17:07:52		0.00016	0.00018	0.00122
		17:08:02		0.00019	0.00018	0.00116
		17:08:12		0.00017	0.00018	0.00118
		17:08:22		0.00021	0.00024	0.00122
		17:08:32		0.00059	0.00054	0.00077
		17:08:42		0.00054	0.00057	0.00054
		17:08:52		0.00013	0.00010	0.00066
		17:09:02		0.00010	0.00010	0.00074
		17:09:12		0.00020	0.00021	0.00136
		17:09:22		0.00022	0.00020	0.00083
		17:09:32		0.00020	0.00020	0.00076
		17:09:42		0.00015	0.00013	0.00092
		17:09:52		0.00021	0.00021	0.00102
		17:10:02		0.00018	0.00021	0.00069
		17:10:12		0.00031	0.00031	0.00068
		17:10:22		0.00066	0.00063	0.00101
		17:10:32		0.00020	0.00021	0.00080
		17:10:42		0.00021	0.00019	0.00089
		17:10:52		0.00016	0.00019	0.00069

Date	Position	Time	Meas. Length	X VDV	Y VDV	Z VDV
		17:11:02		0.00011	0.00013	0.00080
		17:11:12		0.00014	0.00018	0.00080
		17:11:22		0.00018	0.00018	0.00070
		17:11:32		0.00028	0.00028	0.00091
		17:11:42		0.00020	0.00018	0.00088
		17:11:52		0.00017	0.00021	0.00074
		17:12:02		0.00015	0.00017	0.00073
		17:12:12		0.00021	0.00018	0.00069
		17:12:22		0.00019	0.00017	0.00070
		17:12:32		0.00018	0.00020	0.00248
		17:12:42		0.00015	0.00016	0.00059
		17:12:52		0.00025	0.00023	0.00076
		17:13:02		0.00020	0.00020	0.00060
		17:13:12		0.00011	0.00012	0.00082
		17:13:22		0.00019	0.00023	0.00221
		17:13:32		0.00016	0.00016	0.00088
		17:13:42		0.00010	0.00012	0.00067
		17:13:52		0.00013	0.00015	0.00066
		17:14:02		0.00012	0.00013	0.00072
		17:14:12		0.00018	0.00021	0.00066
		17:14:22		0.00019	0.00016	0.00056
		17:14:32		0.00018	0.00018	0.00049
		17:14:42		0.00053	0.00054	0.00054
		17:14:52		0.00020	0.00021	0.00112
		17:15:02		0.00018	0.00016	0.00068
		17:15:12		0.00020	0.00018	0.00073
		17:15:22		0.00018	0.00018	0.00065
		17:15:32		0.00018	0.00016	0.00060
		17:15:42		0.00023	0.00022	0.00068
		17:15:52		0.00022	0.00022	0.00069
		17:16:02		0.00012	0.00012	0.00074
		17:16:12		0.00017	0.00017	0.00118
		17:16:22		0.00024	0.00023	0.00092
		17:16:32		0.00021	0.00018	0.00088
		17:16:42		0.00020	0.00021	0.00059
		17:16:52		0.00022	0.00021	0.00100

Date	Position	Time	Meas. Length	X VDV	Y VDV	Z VDV
		17:17:02		0.00021	0.00023	0.00105
		17:17:12		0.00025	0.00024	0.00141
		17:17:22		0.00023	0.00023	0.00059
		17:17:32		0.00018	0.00021	0.00044
		17:17:42		0.00021	0.00022	0.00051
		17:17:52		0.00023	0.00024	0.00077
		17:18:02		0.00021	0.00025	0.00094
		17:18:12		0.00022	0.00021	0.00066
		17:18:22		0.00022	0.00023	0.00087
		17:18:32		0.00045	0.00045	0.00092
		17:18:42		0.00067	0.00070	0.00100
		17:18:52		0.00030	0.00032	0.00074
		17:19:02		0.00018	0.00020	0.00082
		17:19:12		0.00027	0.00025	0.00109
		17:19:22		0.00022	0.00020	0.00092
		17:19:32		0.00053	0.00051	0.00082
		17:19:42		0.00045	0.00042	0.00087
		17:19:52		0.00055	0.00059	0.00072

Note 1: Vibration measurements were taken across the low-frequency range (1-80Hz)

Attended Ground-borne Noise Calculation Results:



Appendix 3 Modelling Results

Modelling Software:

CADNA/A Version 2023

Modelled Scenarios:

- Day and night-time average noise levels across the site
- Night-time maximum noise levels across the site

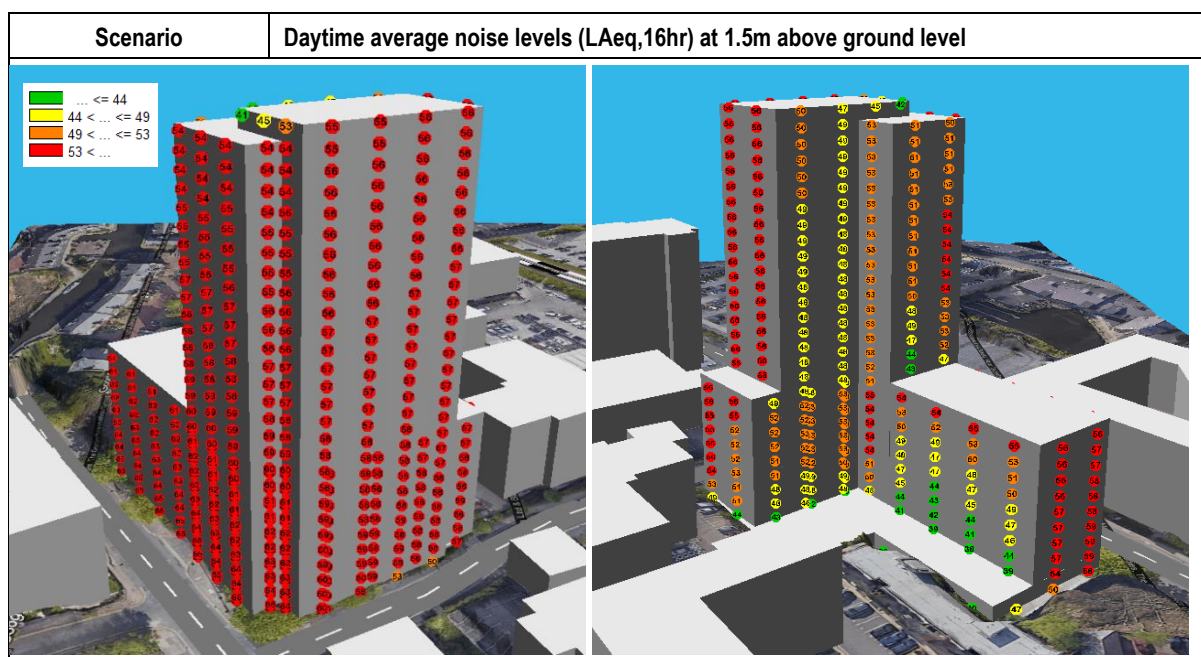
Data inputs:

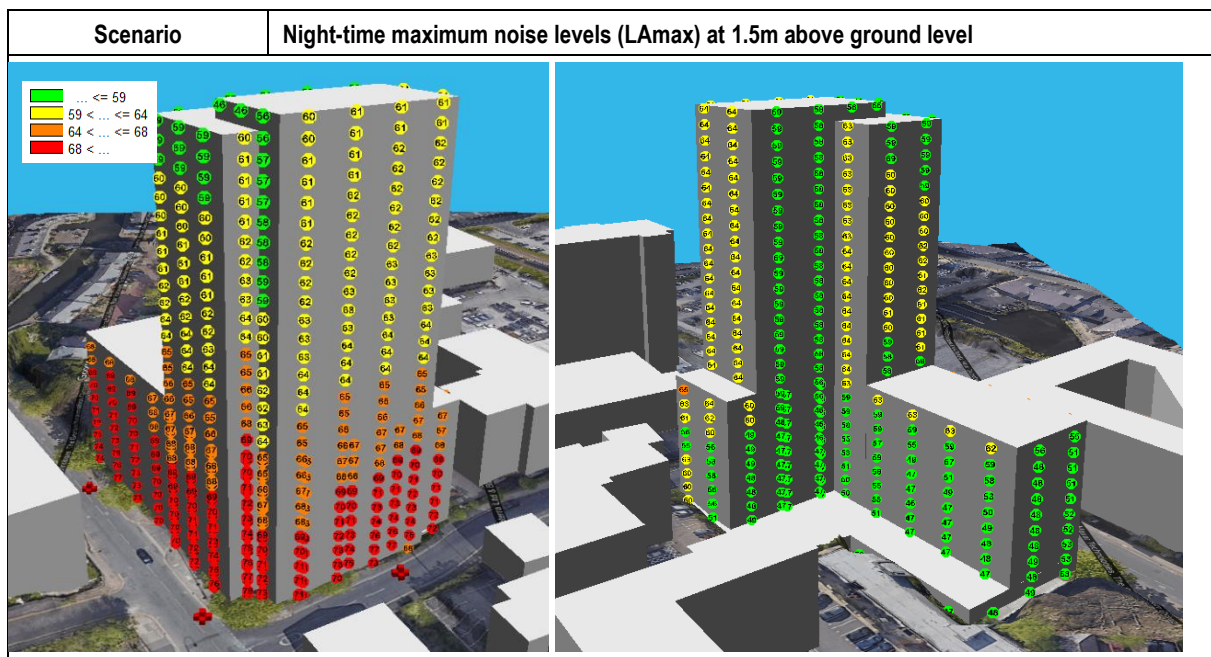
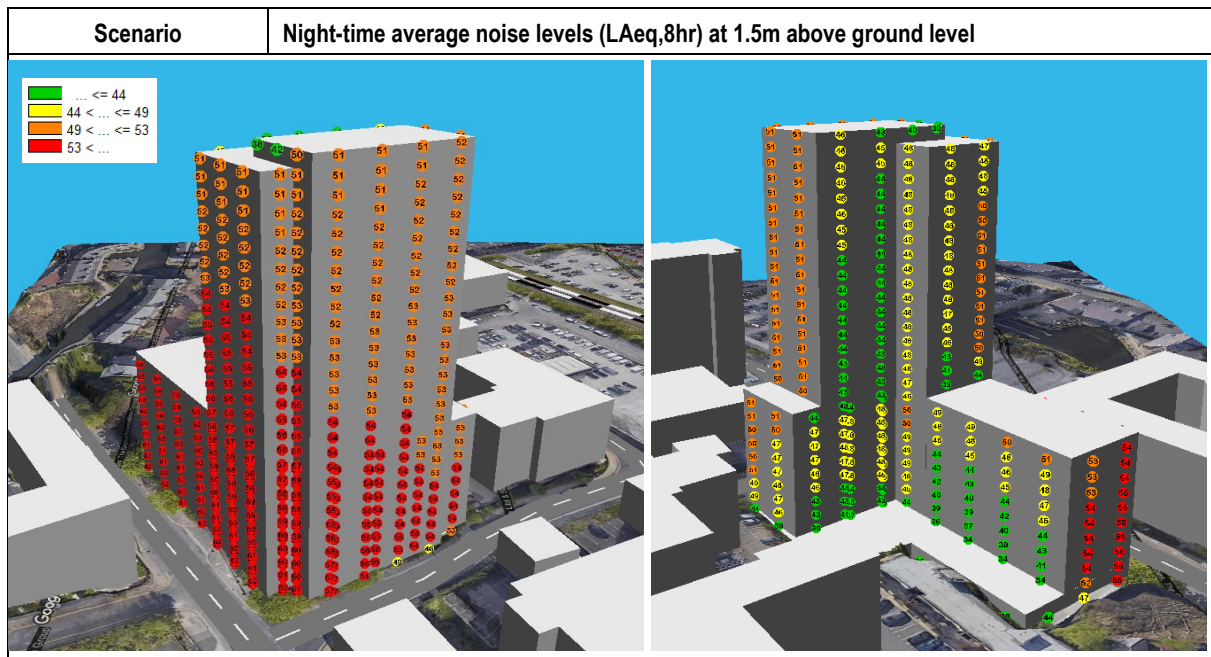
- Noise survey results
- Topographical data for the site
- Development layout

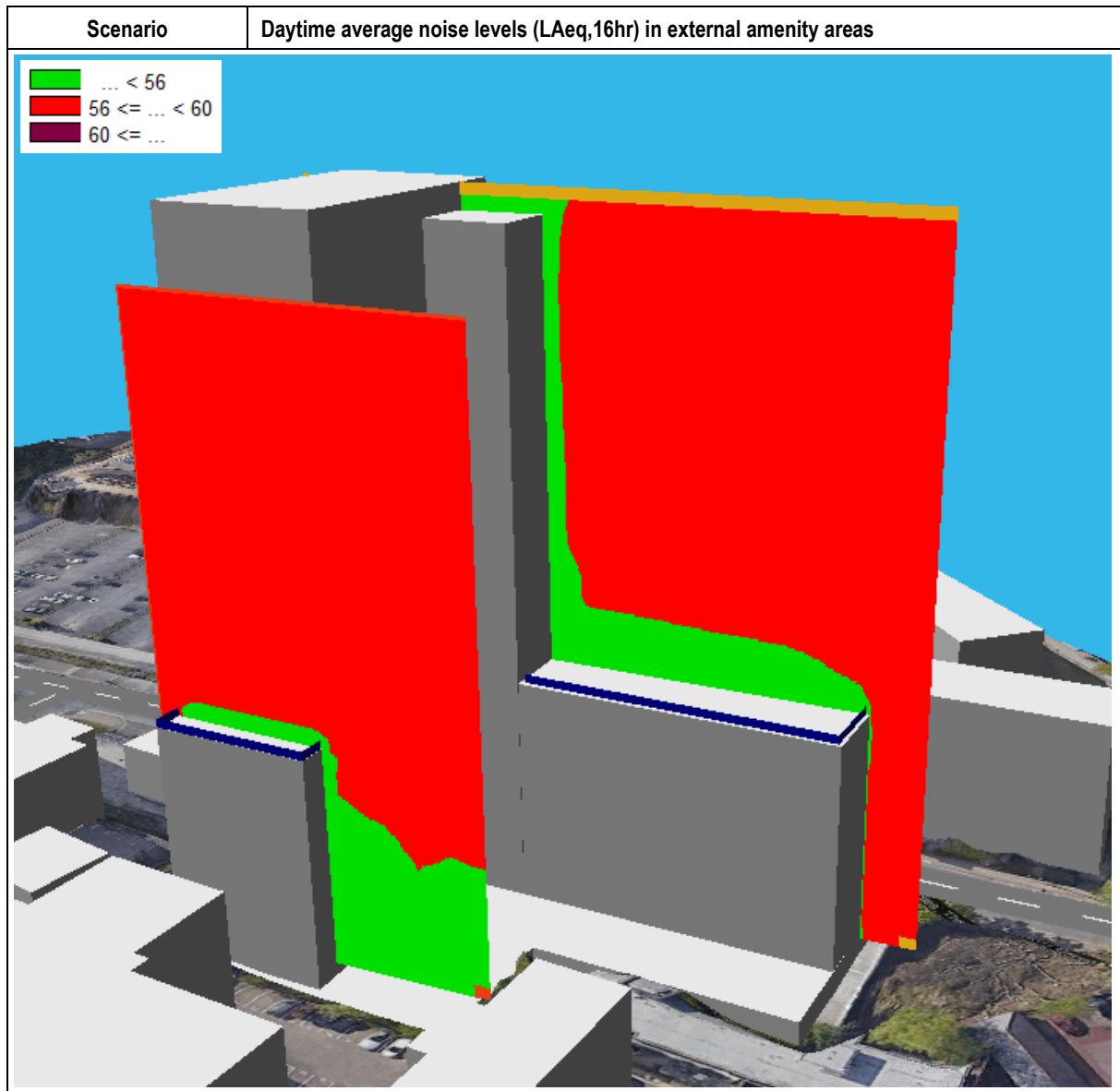
Calculation Algorithms Used:

- Calculation of Road Traffic Noise 1988 – Department of Transport
- ISO 9613-1:1993 Acoustics-Attenuation of sound during propagation outdoors – Part 1: Calculation of the absorption of sound by the atmosphere
- ISO 9613-2:1996 Acoustics-Attenuation of sound during propagation outdoors – Part 2: General method of calculation

Modelling Printout:







Appendix 4 Facade Calculations

[THIS PAGE IS INTENTIONALLY LEFT BLANK]

CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Bedroom (overlooking Sparkle Street)

RUN REF: 23244

VARIANT: Daytime Average Noise Levels (LAeq,16hr)

Room Dimensions [m]

W

2.7

X

L

3.0

X

H

2.6

Room Volume =

21.1

m3

Partition Area =

7.0

m2

Ventilation ref area =

10.0

m2

Free Field SPL K =

3

dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	60.0							
	41.8	45.9	49.4	52.8	56.0	53.2	48.0	Reference spectrum

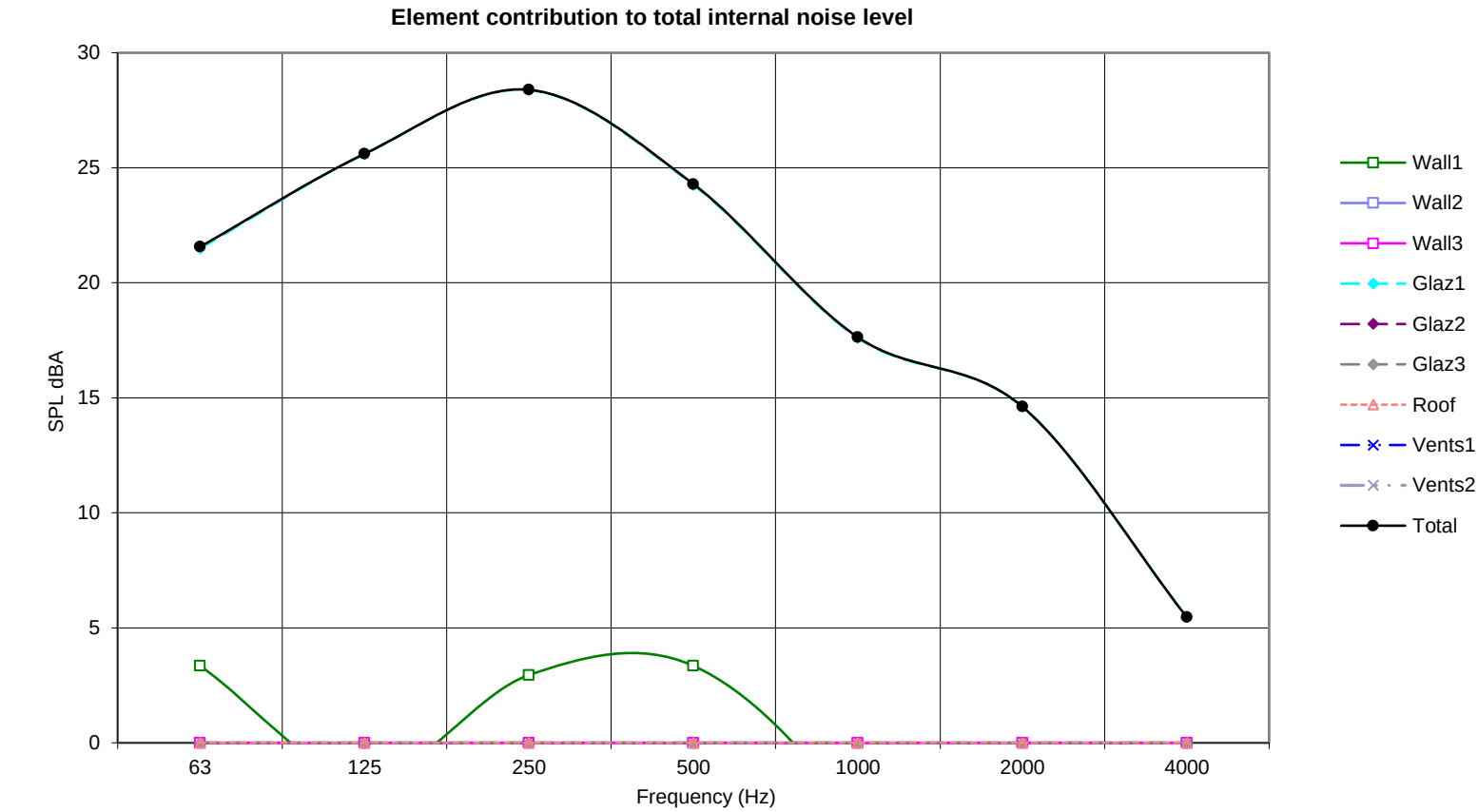
REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

NOTES:

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	1.9	36	45	44	47	57	67	77	0%	54	0	-4
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	30 dB Rw + Ctr - Acoustically Upgraded Double Glazing	5.1	22	22	23	30	40	40	44	99%	30 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant composite Façade SRI			23	23	24	32	42	42	46				
Resultant SPL inside room excluding ventilators dB			31.9	22	26	28	24	18	15	5	100%		

Ventilator Type		Num	D _{n,e} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation			0	0	0	0	0	0	0	0%			
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%		
Total SPL inside room			31.9	22	26	28	24	18	15	5			



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Bedroom (overlooking Sparkle Street)

RUN REF: 23244

VARIANT: Night-time Average Noise Levels (LAeq,8hr)

Room Dimensions [m]

W

2.7

X

L

3.0

X

H

2.6

Room Volume =

21.1

m3

Partition Area =

7.0

m2

Ventilation ref area =

10.0

m2

Free Field SPL

K =

3

dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	57.0							
	38.8	42.9	46.4	49.8	53.0	50.2	45.0	Reference spectrum

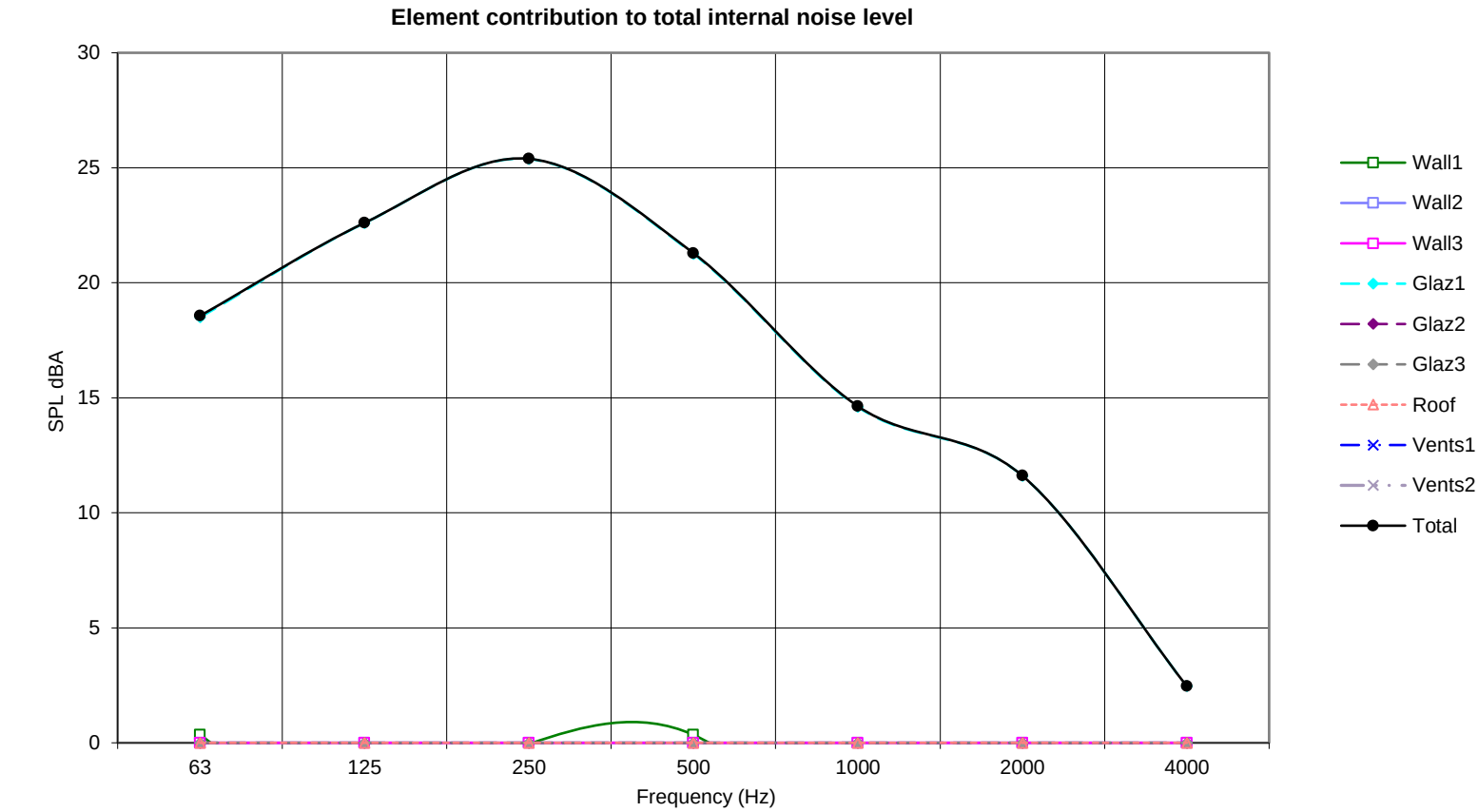
REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

NOTES:

Façade Element			Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity /100mm block	▼	1.9	36	45	44	47	57	67	77	0%	54	0	-4
	ATTENUATION													
Wall 2	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Wall 3	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 1	30 dB Rw + Ctr - Acoustically Upgraded Double Glazing	▼	5.1	22	22	23	30	40	40	44	99%	30 (inc Ctr)	-	-
	ATTENUATION													
Glazing 2		▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 3	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Roof	ROOF / FLOOR	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Resultant composite Façade SRI				23	23	24	32	42	42	46				
Resultant SPL inside room excluding ventilators dB			28.9	19	23	25	21	15	12	2	100%			

Ventilator Type			Num	D _{n,e} dB to BS EN 20140-10:1992									Dnew	C	Ctr
Ventilation				0	0	0	0	0	0	0	0%				
	ATTENUATION														
Ventilation	VENTS			0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%				
Total SPL inside room			28.9	19	23	25	21	15	12	2					



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Bedroom (overlooking Sparkle Street)

RUN REF: 23244

VARIANT: Night-time Maximum Noise Levels (LAmax)

Room Dimensions [m]

W2.7

 X

L3.0

 X

H2.6

Room Volume = 21.1 m3

Partition Area = 7.0 m2

Ventilation ref area = 10.0 m2

Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

Direct input - Free Field SPL (A weighted octave bands) dB ---->	70.0	56.0	55.1	58.2	63.1	65.5	63.3	58.9
Road traffic spectrum (according to BS 8233:1999 section 6)								
		56.0	55.1	58.2	63.1	65.5	63.3	58.9

REVERBERATION TIME

DIRECT INPUT -----> No data

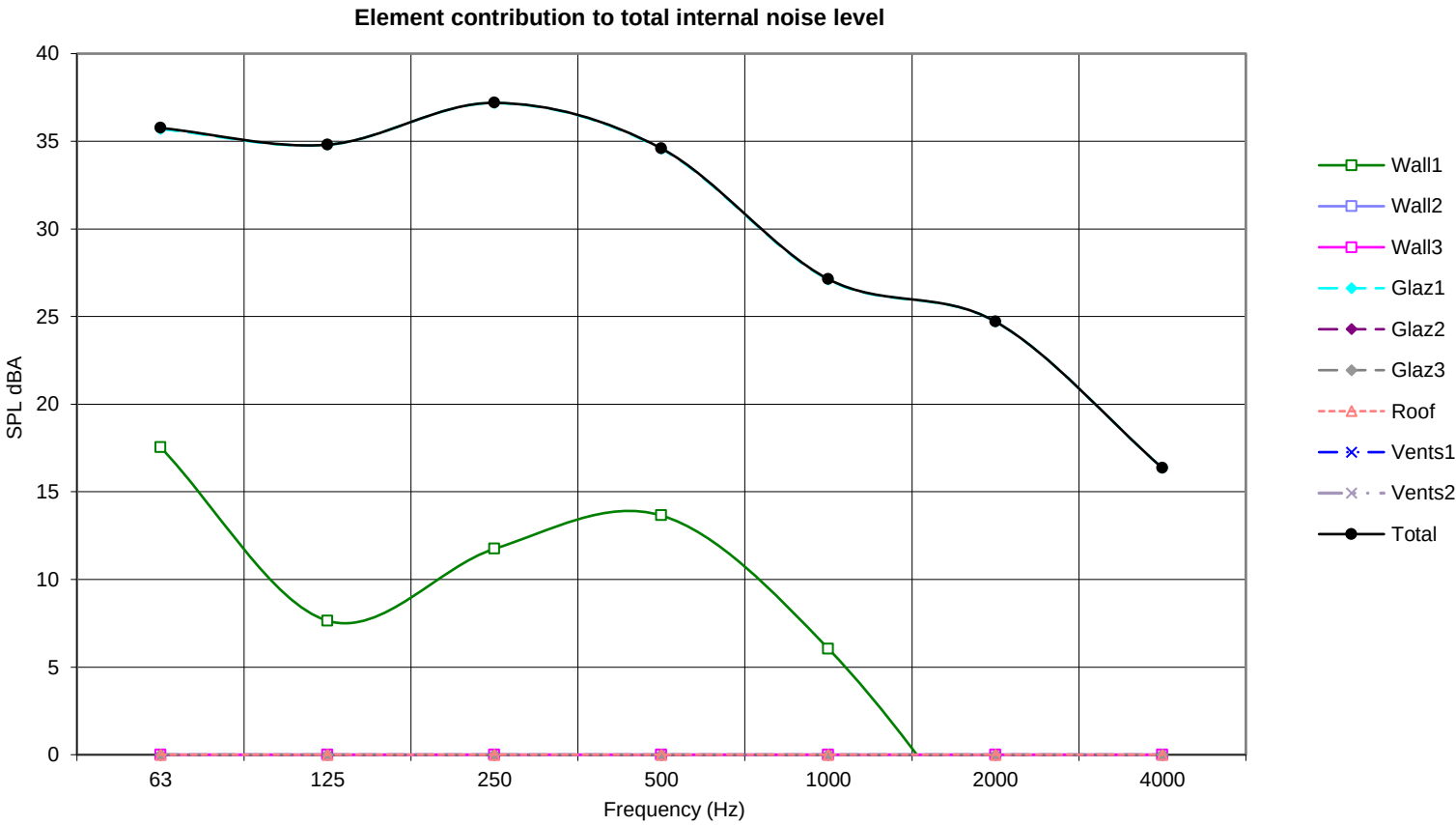
EQUAL RT for all bands -----> Default - RT set to 0.5s

0.50.50.50.50.50.50.5

NOTES:

Façade Element			Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity /100mm block	▼	1.9	36	45	44	47	57	67	77	1%	54	0	-4
	ATTENUATION													
Wall 2	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Wall 3	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 1	30 dB Rw + Ctr - Acoustically Upgraded Double Glazing	▼	5.1	22	22	23	30	40	40	44	99%	30 (inc Ctr)	-	-
	ATTENUATION													
Glazing 2	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 3	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Roof	ROOF / FLOOR	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Resultant composite Façade SRI				23	23	24	32	42	42	46				
Resultant SPL inside room excluding ventilators dB			42.0	36	35	37	35	27	25	16	100%			

Ventilator Type			Num	D _{n,e} dB to BS EN 20140-10:1992									Dnew	C	Ctr
Ventilation				0	0	0	0	0	0	0	0%				
	ATTENUATION														
Ventilation	VENTS			0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant SPL inside room through ventilators dB				-99.0	-96	-96	-96	-96	-96	-96	-96	0%			
Total SPL inside room				42.0	36	35	37	35	27	25	16				



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Bedroom (3 windows, overlooking Store Street)

RUN REF: 23244

VARIANT: Daytime Average Noise Levels (LAeq,16hr)

Room Dimensions [m]

W

2.7

X

L

4.8

X

H

2.6

Room Volume =

33.7

m3

Partition Area =

15.9

m2

Ventilation ref area =

10.0

m2

Free Field SPL

K =

3

dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	65.0							
	46.8	50.9	54.4	57.8	61.0	58.2	53.0	Reference spectrum

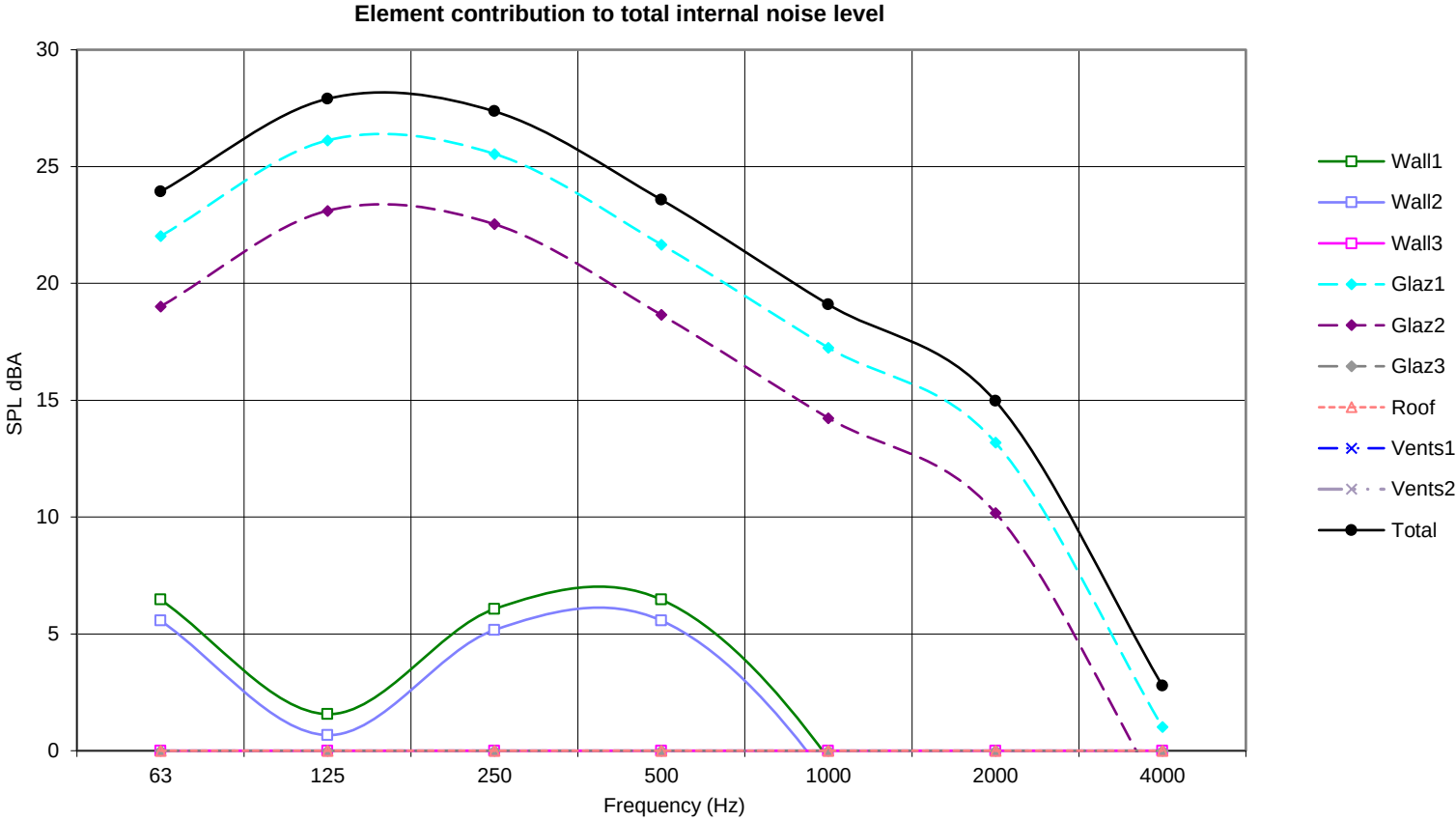
REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

NOTES:

Façade Element			Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	▼	2.0	36	45	44	47	57	67	77	1%	54	0	-4
	ATTENUATION													
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	▼	1.6	36	45	44	47	57	67	77	1%	54	0	-4
	ATTENUATION													
Wall 3	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 1	36 dB Rw + Ctr - High Acoustic Performance Double Glazing	▼	8.2	27	27	31	38	46	47	54	65%	36 (inc Ctr)	-	-
	ATTENUATION													
Glazing 2	36 dB Rw + Ctr - High Acoustic Performance Double Glazing	▼	4.1	27	27	31	38	46	47	54	33%	36 (inc Ctr)	-	-
	ATTENUATION													
Glazing 3	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Roof	ROOF / FLOOR	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Resultant composite Façade SRI				28	28	32	39	47	48	55				
Resultant SPL inside room excluding ventilators dB			32.4	24	28	27	24	19	15	3	100%			

Ventilator Type			Num	D _{n,e} dB to BS EN 20140-10:1992									Dnew	C	Ctr
Ventilation				0	0	0	0	0	0	0	0%				
	ATTENUATION														
Ventilation	VENTS			0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%				
Total SPL inside room			32.4	24	28	27	24	19	15	3					



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Bedroom (3 windows, overlooking Store Street)

RUN REF: 23244

VARIANT: Night-time Average Noise Levels (LAeq,8hr)

Room Dimensions [m]

W

2.7

X

L

4.8

X

H

2.6

Room Volume =

33.7

m3

Partition Area =

15.9

m2

Ventilation ref area =

10.0

m2

Free Field SPL

K =

3

dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	62.0							
	43.8	47.9	51.4	54.8	58.0	55.2	50.0	Reference spectrum

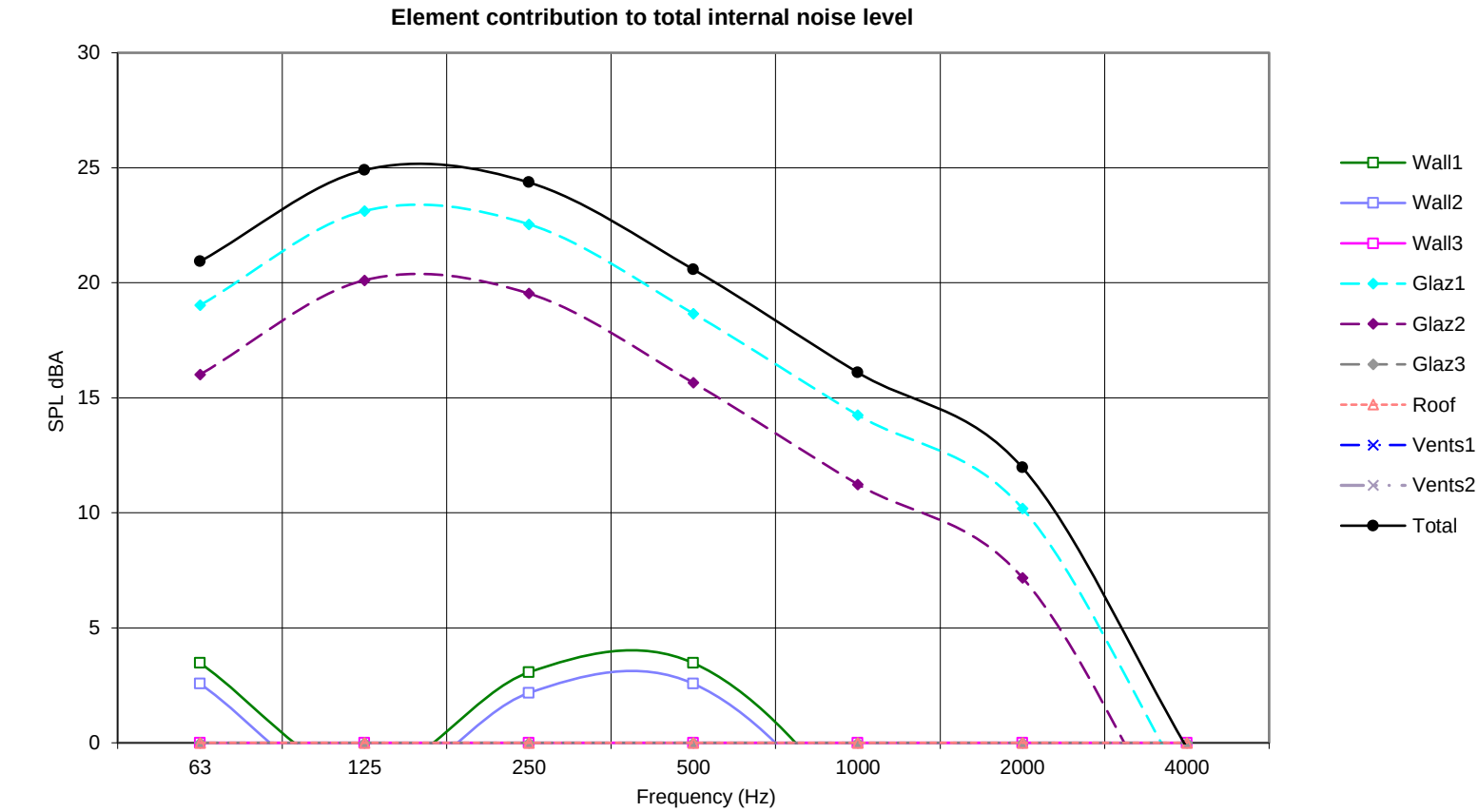
REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

NOTES:

Façade Element			Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	▼	2.0	36	45	44	47	57	67	77	1%	54	0	-4
	ATTENUATION													
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	▼	1.6	36	45	44	47	57	67	77	0%	54	0	-4
	ATTENUATION													
Wall 3	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 1	36 dB Rw + Ctr - High Acoustic Performance Double Glazing	▼	8.2	27	27	31	38	46	47	54	66%	36 (inc Ctr)	-	-
	ATTENUATION													
Glazing 2	36 dB Rw + Ctr - High Acoustic Performance Double Glazing	▼	4.1	27	27	31	38	46	47	54	33%	36 (inc Ctr)	-	-
	ATTENUATION													
Glazing 3	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Roof	ROOF / FLOOR	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Resultant composite Façade SRI				28	28	32	39	47	48	55				
Resultant SPL inside room excluding ventilators dB			29.4	21	25	24	21	16	12	0	100%			

Ventilator Type			Num	D _{n,e} dB to BS EN 20140-10:1992									Dnew	C	Ctr
Ventilation				0	0	0	0	0	0	0	0%				
	ATTENUATION														
Ventilation	VENTS			0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%				
Total SPL inside room			29.4	21	25	24	21	16	12	0					



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Bedroom (3 windows, overlooking Store Street)

RUN REF: 23244

VARIANT: Night-time Maximum Noise Levels (LAmax)

Room Dimensions [m]

W2.7

 X

L4.8

 X

H2.6

Room Volume = 33.7 m3

Partition Area = 15.9 m2

Ventilation ref area = 10.0 m2

Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

Direct input - Free Field SPL (A weighted octave bands) dB ----->	77.0	63.0	62.1	65.2	70.1	72.5	70.3	65.9
Road traffic spectrum (according to BS 8233:1999 section 6)								
		63.0	62.1	65.2	70.1	72.5	70.3	65.9

REVERBERATION TIME

DIRECT INPUT -----> No data

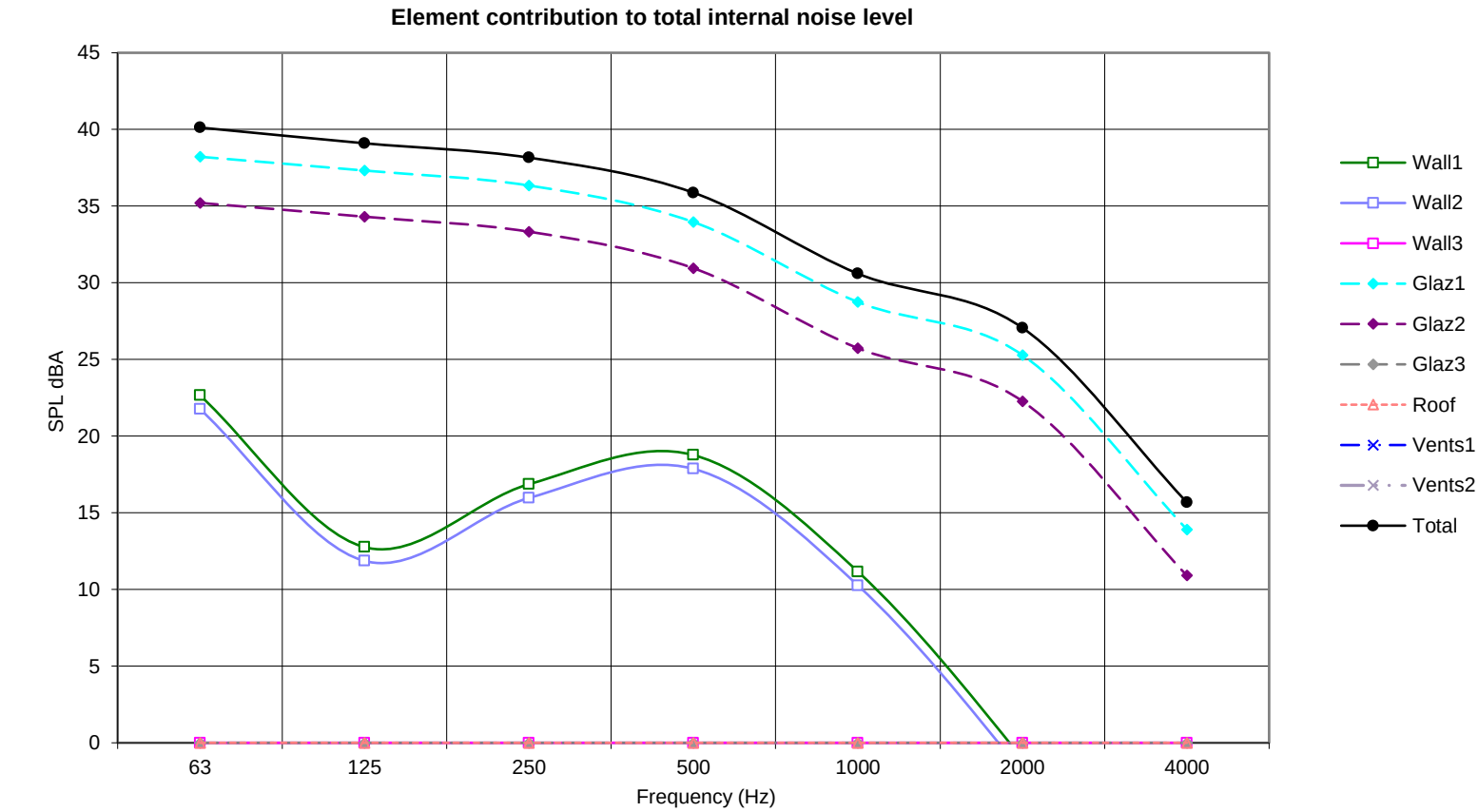
EQUAL RT for all bands -----> Default - RT set to 0.5s

0.50.50.50.50.50.50.5

NOTES:

Façade Element			Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr	
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	▼	2.0	36	45	44	47	57	67	77	1%	54	0	-4	
	ATTENUATION														
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	▼	1.6	36	45	44	47	57	67	77	1%	54	0	-4	
	ATTENUATION														
Wall 3	WALLS	▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Glazing 1	36 dB Rw + Ctr - High Acoustic Performance Double Glazing	▼	8.2	27	27	31	38	46	47	54	65%	36 (inc Ctr)	-	-	
	ATTENUATION														
Glazing 2	36 dB Rw + Ctr - High Acoustic Performance Double Glazing	▼	4.1	27	27	31	38	46	47	54	33%	36 (inc Ctr)	-	-	
	ATTENUATION														
Glazing 3	GLAZING	▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Roof	ROOF / FLOOR	▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant composite Façade SRI				28	28	32	39	47	48	55					
Resultant SPL inside room excluding ventilators dB				44.8	40	39	38	36	31	27	16	100%			

Ventilator Type			Num	D _{n,e} dB to BS EN 20140-10:1992									Dnew	C	Ctr
Ventilation				0	0	0	0	0	0	0	0%				
	ATTENUATION														
Ventilation	VENTS			0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%				
Total SPL inside room			44.8	40	39	38	36	31	27	16					



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Bedroom (Townhouse)

RUN REF: 23244

VARIANT: Daytime Average Noise Levels (LAeq,16hr)

Room Dimensions [m]

W

2.8

X

L

3.7

X

H

2.6

Room Volume =

26.5

m3

Partition Area =

7.2

m2

Ventilation ref area =

10.0

m2

Free Field SPL K =

3

dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	65.0							
	46.8	50.9	54.4	57.8	61.0	58.2	53.0	Reference spectrum

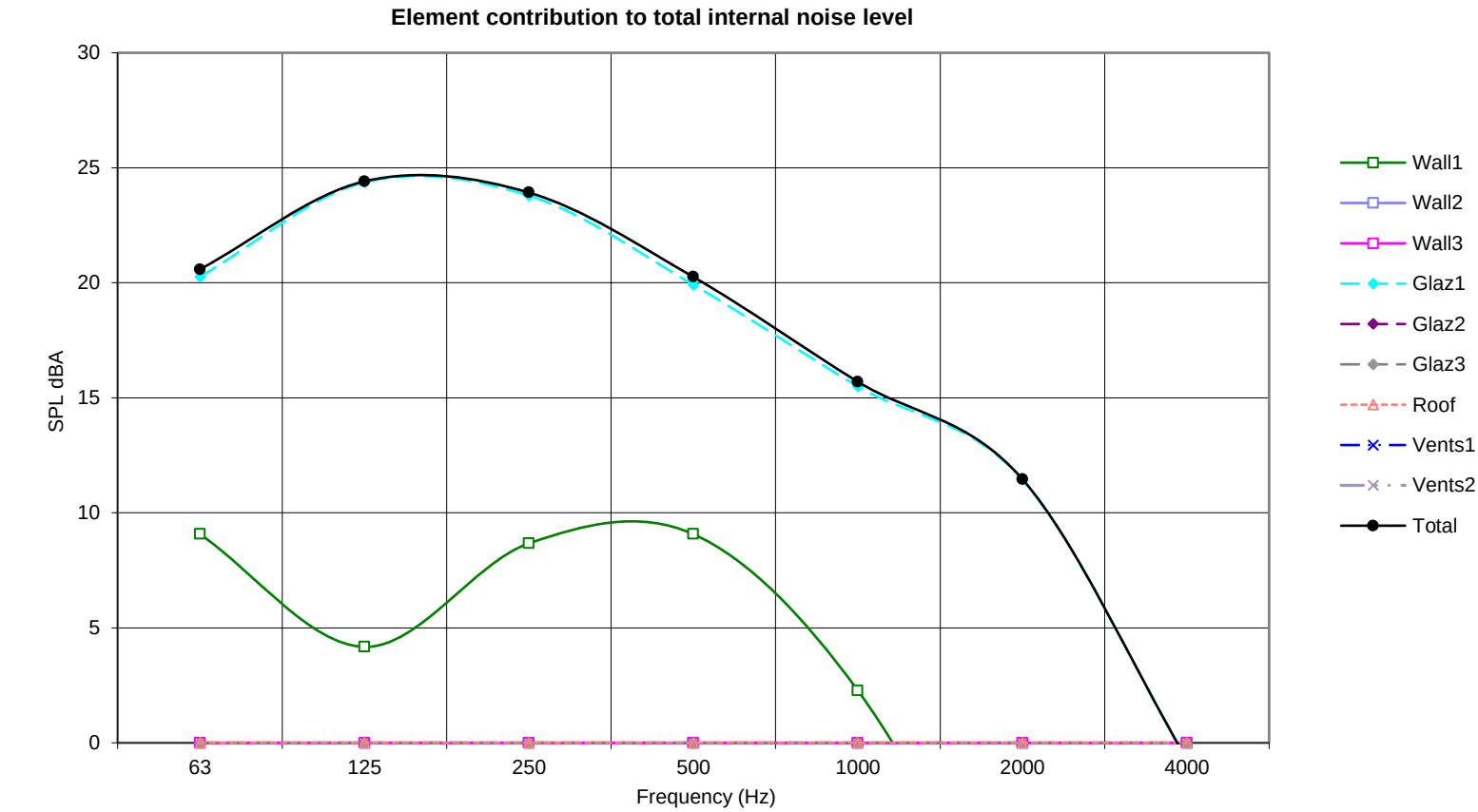
REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

NOTES:

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	2.9	36	45	44	47	57	67	77	3%	54	0	-4
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	36 dB Rw + Ctr - High Acoustic Performance Double Glazing	4.3	27	27	31	38	46	47	54	96%	36 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant composite Façade SRI			28	29	33	40	48	49	56				
Resultant SPL inside room excluding ventilators dB			29.0	21	24	24	20	16	11	-1	100%		

Ventilator Type		Num	D _{n,e} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation			0	0	0	0	0	0	0	0%			
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%		
Total SPL inside room			29.0	21	24	24	20	16	11	-1			



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Bedroom (Townhouse)

RUN REF: 23244

VARIANT: Night-time Average Noise Levels (LAeq,8hr)

Room Dimensions [m]

W

2.8

X

L

3.7

X

H

2.6

Room Volume =

26.5

m3

Partition Area =

7.2

m2

Ventilation ref area =

10.0

m2

Free Field SPL

K =

3

dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	62.0							
	43.8	47.9	51.4	54.8	58.0	55.2	50.0	Reference spectrum

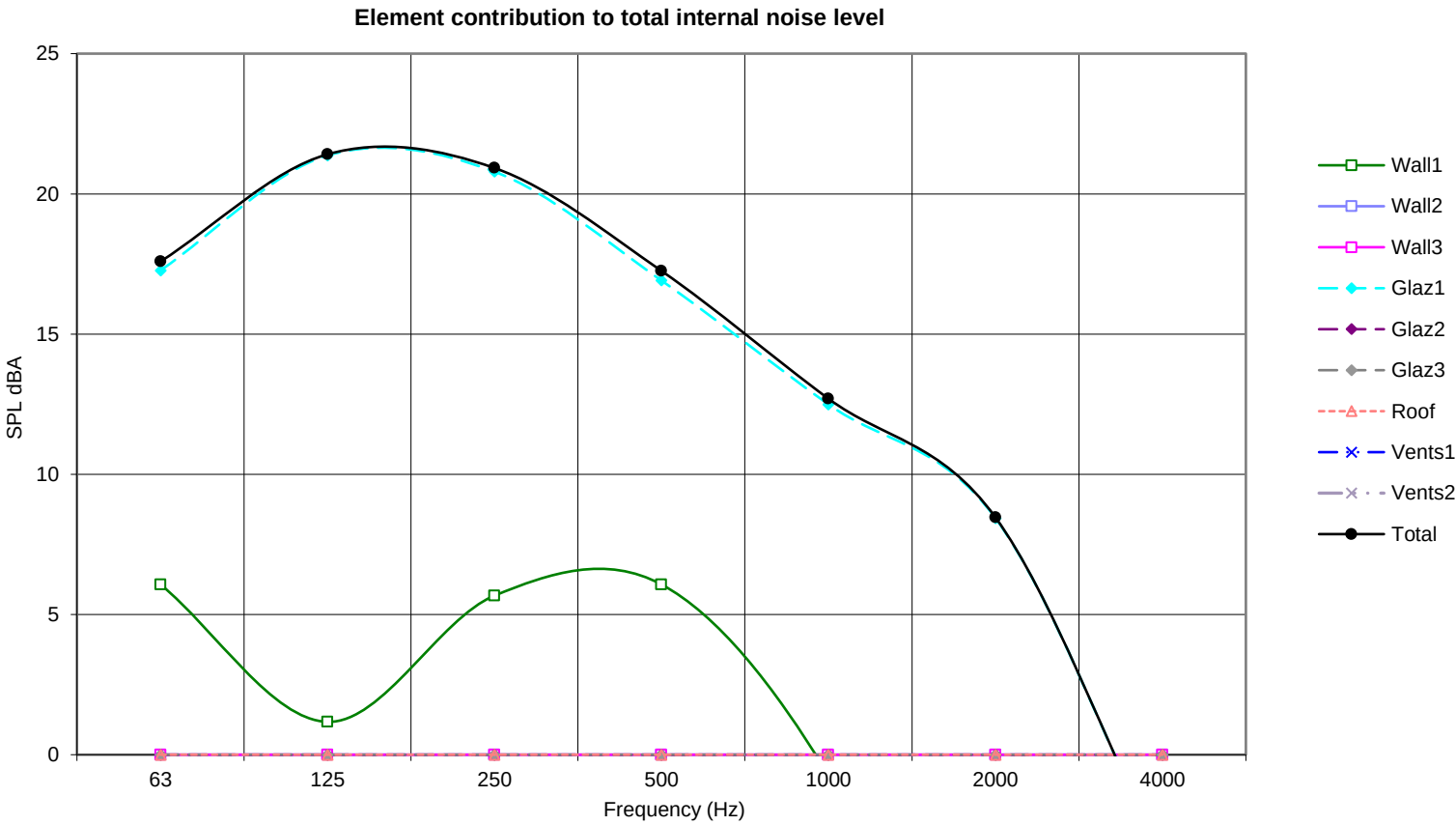
REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

NOTES:

Façade Element			Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	▼	2.9	36	45	44	47	57	67	77	3%	54	0	-4
	ATTENUATION													
Wall 2	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Wall 3	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 1	36 dB Rw + Ctr - High Acoustic Performance Double Glazing	▼	4.3	27	27	31	38	46	47	54	95%	36 (inc Ctr)	-	-
	ATTENUATION													
Glazing 2	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 3	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Roof	ROOF / FLOOR	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Resultant composite Façade SRI				28	29	33	40	48	49	56				
Resultant SPL inside room excluding ventilators dB			26.0	18	21	21	17	13	8	-4	100%			

Ventilator Type			Num	D _{n,e} dB to BS EN 20140-10:1992									Dnew	C	Ctr
Ventilation				0	0	0	0	0	0	0	0%				
	ATTENUATION														
Ventilation	VENTS			0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%				
Total SPL inside room			26.0	18	21	21	17	13	8	-4					



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Bedroom (Townhouse)

RUN REF: 23244

VARIANT: Night-time Maximum Noise Levels (LAmax)

Room Dimensions [m]

W2.8

 X

L3.7

 X

H2.6

Room Volume = 26.5 m3

Partition Area = 7.2 m2

Ventilation ref area = 10.0 m2

Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

Direct input - Free Field SPL (A weighted octave bands) dB ----->	78.0	64.0	63.1	66.2	71.1	73.5	71.3	66.9
Road traffic spectrum (according to BS 8233:1999 section 6)								
		64.0	63.1	66.2	71.1	73.5	71.3	66.9

REVERBERATION TIME

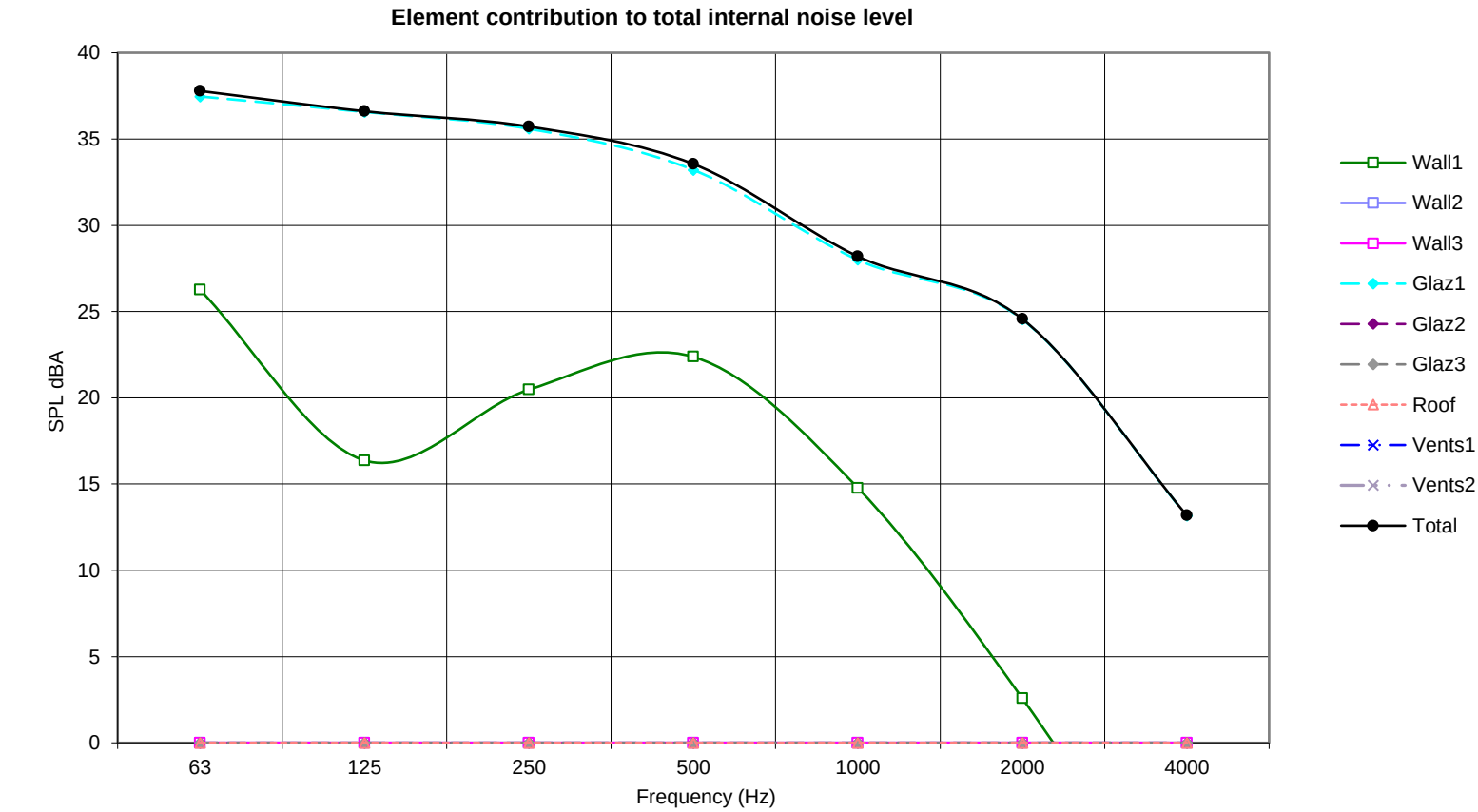
DIRECT INPUT -----> No data

EQUAL RT for all bands -----> Default - RT set to 0.5s

NOTES:

Façade Element			Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	▼	2.9	36	45	44	47	57	67	77	4%	54	0	-4
	ATTENUATION													
Wall 2	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Wall 3	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 1	36 dB Rw + Ctr - High Acoustic Performance Double Glazing	▼	4.3	27	27	31	38	46	47	54	96%	36 (inc Ctr)	-	-
	ATTENUATION													
Glazing 2	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 3	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Roof	ROOF / FLOOR	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Resultant composite Façade SRI				28	29	33	40	48	49	56				
Resultant SPL inside room excluding ventilators dB			42.4	38	37	36	34	28	25	13	100%			

Ventilator Type			Num	D _{n,e} dB to BS EN 20140-10:1992									Dnew	C	Ctr
Ventilation				0	0	0	0	0	0	0	0%				
	ATTENUATION														
Ventilation	VENTS			0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%				
Total SPL inside room			42.4	38	37	36	34	28	25	13					



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Bedroom (South facing)

RUN REF: 23244

VARIANT: Daytime Average Noise Levels (LAeq,16hr)

Room Dimensions [m]

W

2.7

X

L

3.0

X

H

2.6

Room Volume =

21.1

m3

Partition Area =

7.0

m2

Ventilation ref area =

10.0

m2

Free Field SPL K =

3

dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	55.0							
	36.8	40.9	44.4	47.8	51.0	48.2	43.0	Reference spectrum

REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

NOTES:

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	1.9	36	45	44	47	57	67	77	0%	54	0	-4
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	27 dB Rw + Ctr - Standard Thermal Double Glazing	5.1	20	20	19	27	38	37	40	99%	27 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant composite Façade SRI			21	21	20	28	39	39	41				
Resultant SPL inside room excluding ventilators dB			30.3	19	23	27	23	15	13	5	100%		

Ventilator Type		Num	D _{n,e} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation			0	0	0	0	0	0	0	0%			
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%		
Total SPL inside room			30.3	19	23	27	23	15	13	5			



CLIENT:

PROJECT:

ROOM:

RUN REF:

VARIANT:

MIDGARD LTD

Sparkle Street, Manchester

Bedroom (South facing)

23244

Night-time Average Noise Levels (LAeq,8hr)

Room Dimensions [m]

W

2.7

X

L

3.0

X

H

2.6

Room Volume =

21.1

m3

Partition Area =

7.0

m2

Ventilation ref area =

10.0

m2

Free Field SPL K =

3

dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	51.0							
	32.8	36.9	40.4	43.8	47.0	44.2	39.0	Reference spectrum

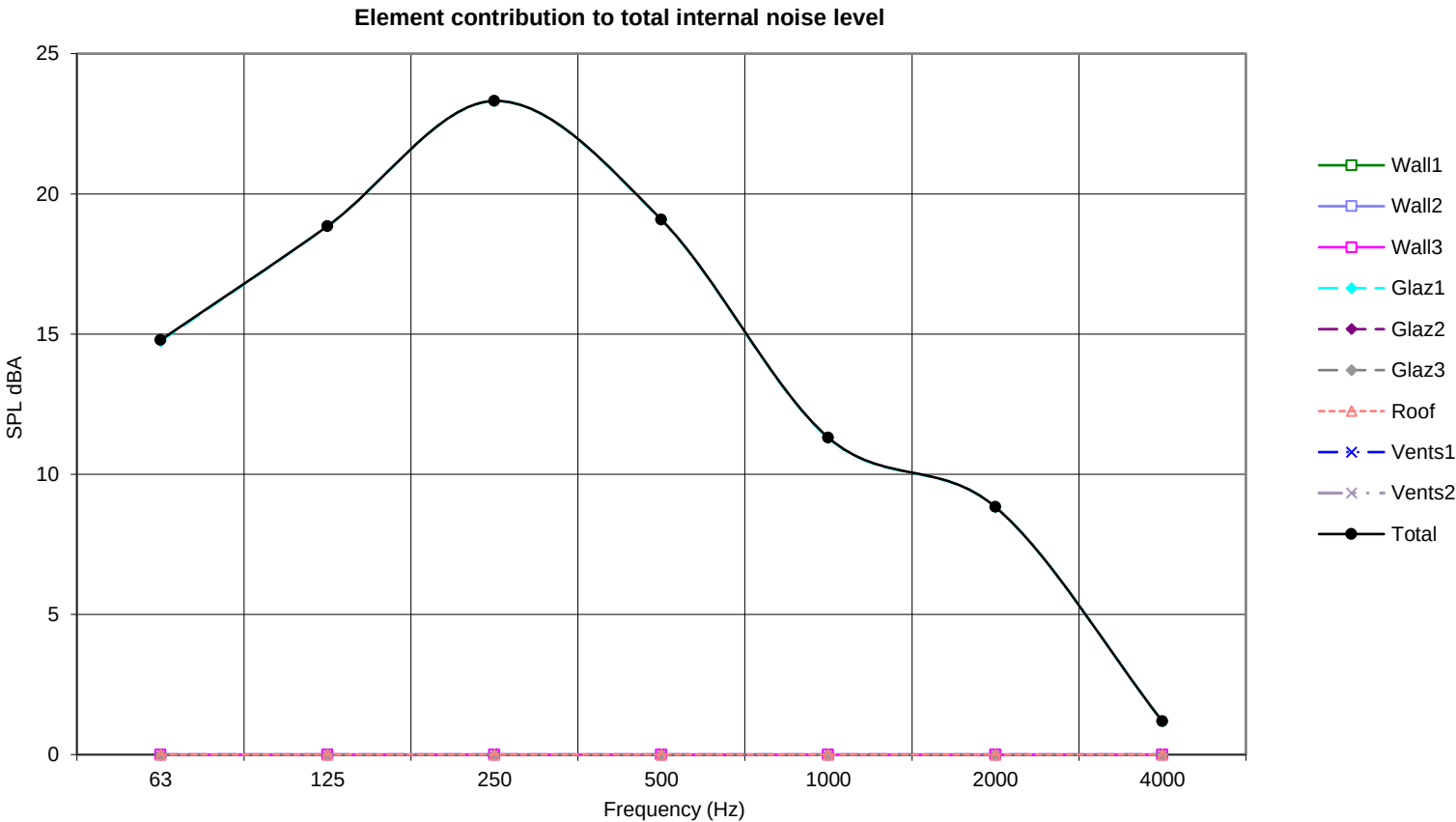
REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

NOTES:

Façade Element			Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr	
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	▼	1.9	36	45	44	47	57	67	77	0%	54	0	-4	
	ATTENUATION														
Wall 2	WALLS	▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Wall 3	WALLS	▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Glazing 1	27 dB Rw + Ctr - Standard Thermal Double Glazing	▼	5.1	20	20	19	27	38	37	40	98%	27 (inc Ctr)	-	-	
	ATTENUATION														
Glazing 2		▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Glazing 3	GLAZING	▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Roof	ROOF / FLOOR	▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant composite Façade SRI				21	21	20	28	39	39	41					
Resultant SPL inside room excluding ventilators dB				26.3	15	19	23	19	11	9	1	100%			

Ventilator Type		Num	D _{n,e} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation			0	0	0	0	0	0	0	0%			
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%		
Total SPL inside room			26.3	15	19	23	19	11	9	1			



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Bedroom (South facing)

RUN REF: 23244

VARIANT: Night-time Maximum Noise Levels (LAmax)

Room Dimensions [m]

W2.7

 X

L3.0

 X

H2.6

Room Volume = 21.1 m3

Partition Area = 7.0 m2

Ventilation ref area = 10.0 m2

Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000
Direct input - Free Field SPL (A weighted octave bands) dB ----->	64.0	50.0	49.1	52.2	57.1	59.5	57.3
Road traffic spectrum (according to BS 8233:1999 section 6)							
	50.0	49.1	52.2	57.1	59.5	57.3	52.9

REVERBERATION TIME

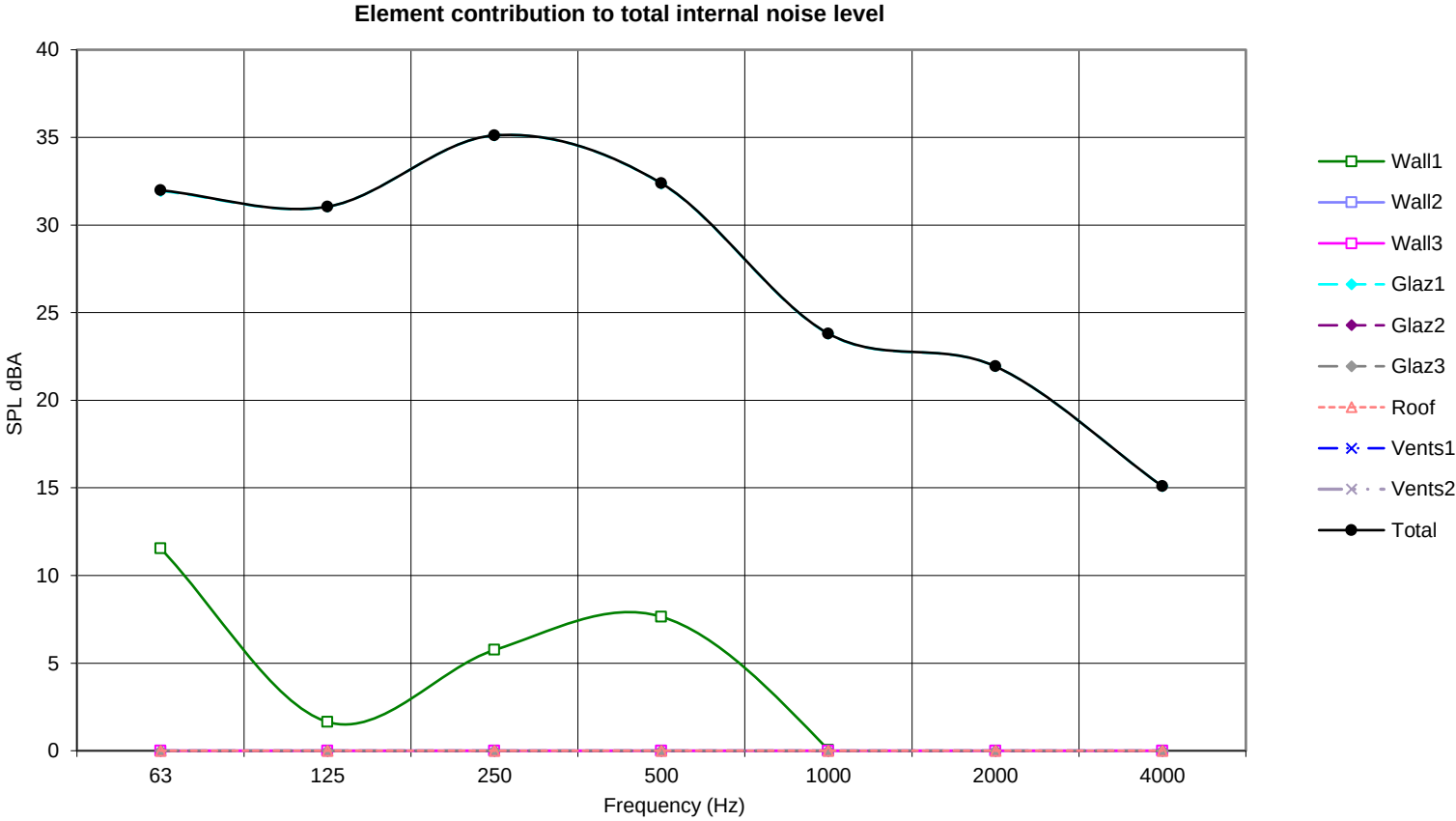
DIRECT INPUT -----> No data

EQUAL RT for all bands -----> Default - RT set to 0.5s

NOTES:

Façade Element			Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity /100mm block	▼	1.9	36	45	44	47	57	67	77	0%	54	0	-4
	ATTENUATION													
Wall 2	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Wall 3	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 1	27 dB Rw + Ctr - Standard Thermal Double Glazing	▼	5.1	20	20	19	27	38	37	40	100%	27 (inc Ctr)	-	-
	ATTENUATION													
Glazing 2	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 3	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Roof	ROOF / FLOOR	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Resultant composite Façade SRI				21	21	20	28	39	39	41				
Resultant SPL inside room excluding ventilators dB			39.2	32	31	35	32	24	22	15	100%			

Ventilator Type			Num	D _{n,e} dB to BS EN 20140-10:1992									Dnew	C	Ctr
Ventilation				0	0	0	0	0	0	0	0%				
	ATTENUATION														
Ventilation	VENTS			0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant SPL inside room through ventilators dB				-99.0	-96	-96	-96	-96	-96	-96	-96	0%			
Total SPL inside room				39.2	32	31	35	32	24	22	15				



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Living Room (Sparkle Street)

RUN REF: 23244

VARIANT: Daytime Average Noise Levels (LAeq,16hr)

Room Dimensions [m]

W5.5

 X

L3.8

 X

H2.6

Room Volume = 53.9 m3

Partition Area = 27.7 m2

Ventilation ref area = 10.0 m2

Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	60.0							
	41.8	45.9	49.4	52.8	56.0	53.2	48.0	Reference spectrum

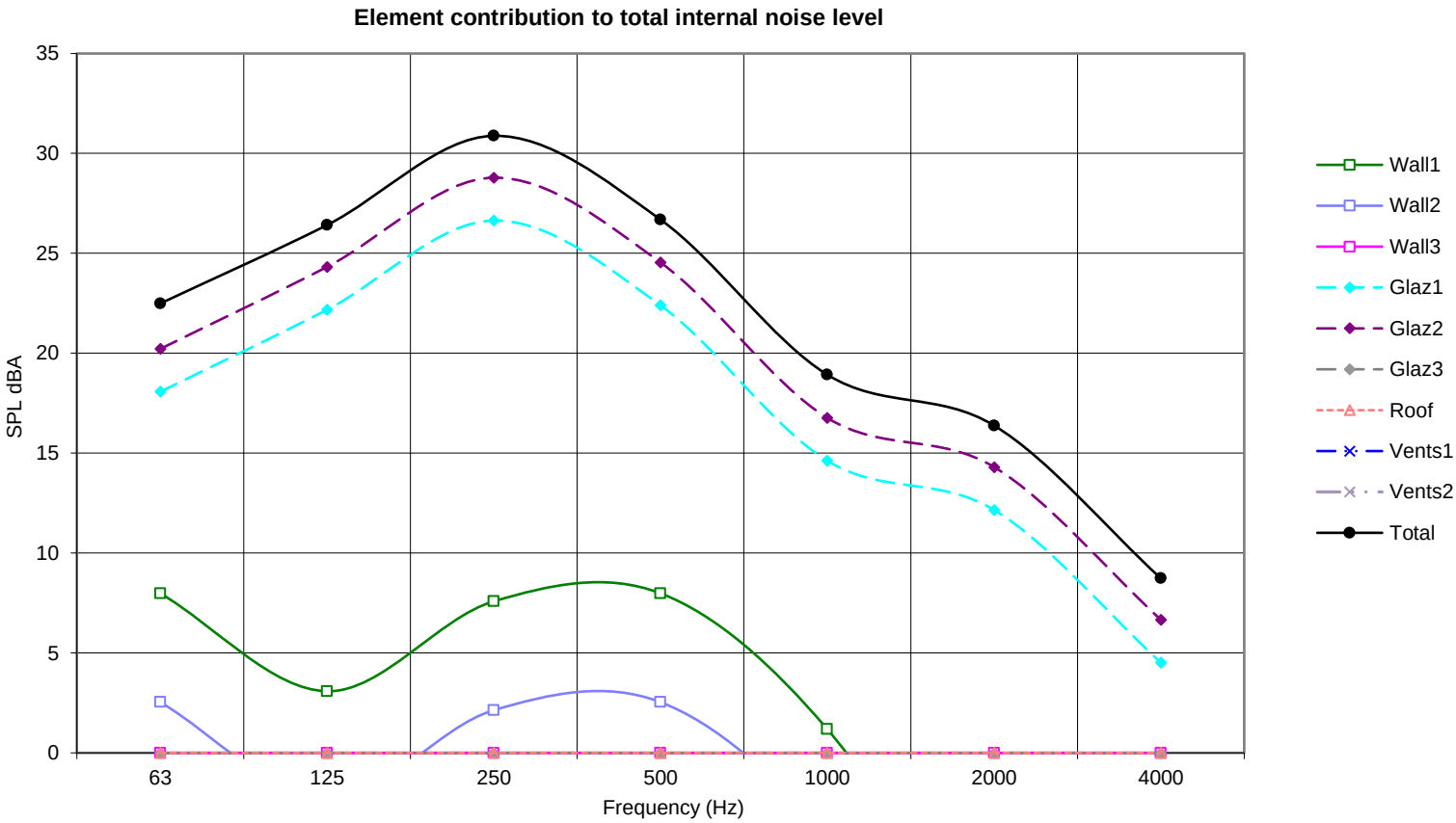
REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

NOTES:

Façade Element			Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr	
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	▼	14.3	36	45	44	47	57	67	77	1%	54	0	-4	
	ATTENUATION														
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	▼	4.1	36	45	44	47	57	67	77	0%	54	0	-4	
	ATTENUATION														
Wall 3	WALLS	▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Glazing 1	27 dB Rw + Ctr - Standard Thermal Double Glazing	▼	3.5	20	20	19	27	38	37	40	37%	27 (inc Ctr)	-	-	
	ATTENUATION														
Glazing 2	27 dB Rw + Ctr - Standard Thermal Double Glazing	▼	5.8	20	20	19	27	38	37	40	61%	27 (inc Ctr)	-	-	
	ATTENUATION														
Glazing 3	GLAZING	▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Roof	ROOF / FLOOR	▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant composite Façade SRI				24	25	24	31	42	42	44					
Resultant SPL inside room excluding ventilators dB				33.9	22	26	31	27	19	16	9	100%			

Ventilator Type			Num	D _{n,e} dB to BS EN 20140-10:1992									Dnew	C	Ctr
Ventilation				0	0	0	0	0	0	0	0%				
	ATTENUATION														
Ventilation	VENTS			0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%				
Total SPL inside room			33.9	22	26	31	27	19	16	9					



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Living Room (South facing)

RUN REF: 23244

VARIANT: Daytime Average Noise Levels (LAeq,16hr)

Room Dimensions [m]

W5.5

 X

L3.8

 X

H2.6

Room Volume = 53.9 m3

Partition Area = 27.7 m2

Ventilation ref area = 10.0 m2

Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	56.0							
	37.8	41.9	45.4	48.8	52.0	49.2	44.0	Reference spectrum

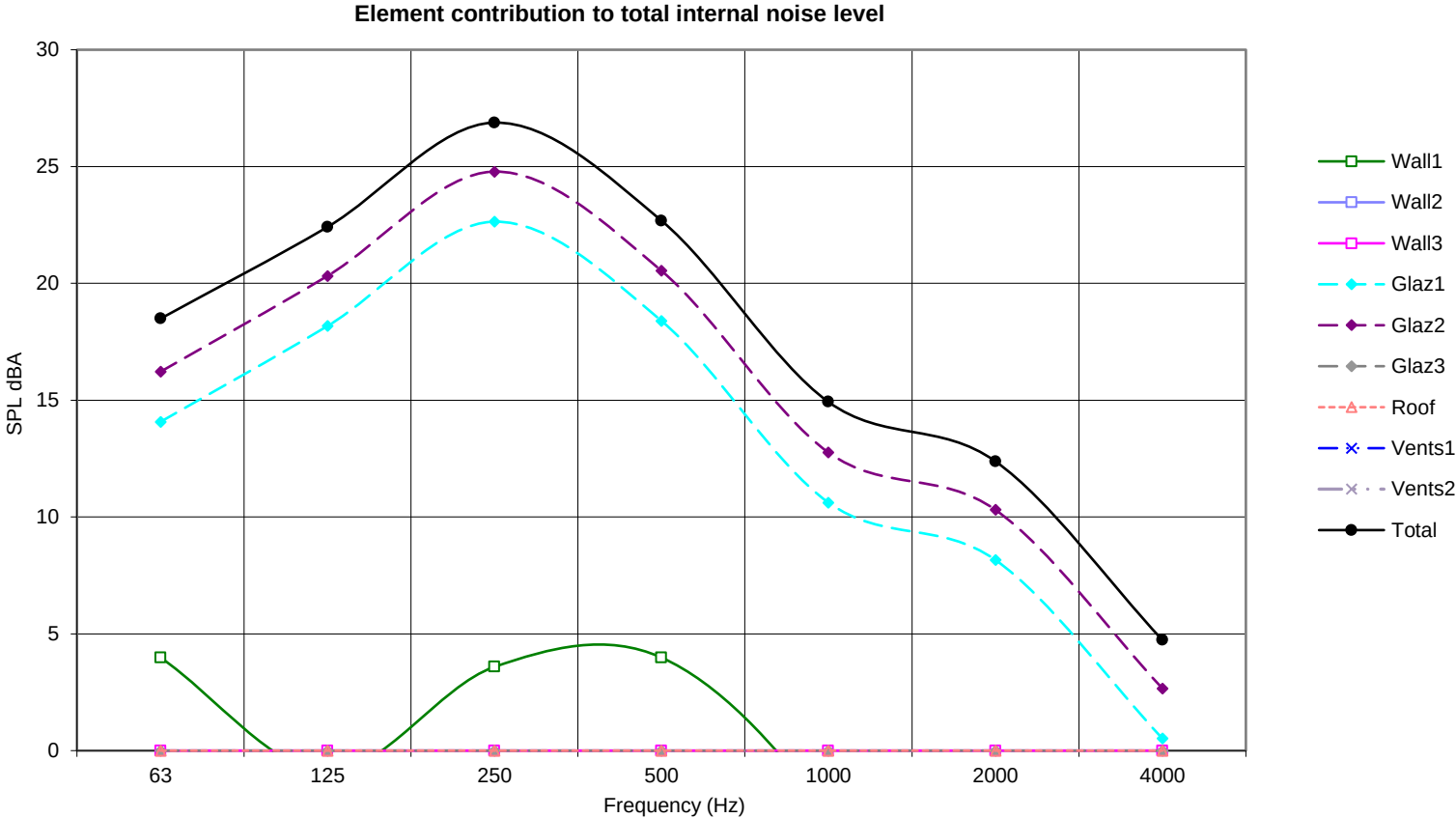
REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

NOTES:

Façade Element			Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	▼	14.3	36	45	44	47	57	67	77	1%	54	0	-4
	ATTENUATION													
Wall 2	Typical - 102mm brick/50mm cavity/100mm block	▼	4.1	36	45	44	47	57	67	77	0%	54	0	-4
	ATTENUATION													
Wall 3	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 1	27 dB Rw + Ctr - Standard Thermal Double Glazing	▼	3.5	20	20	19	27	38	37	40	37%	27 (inc Ctr)	-	-
	ATTENUATION													
Glazing 2	27 dB Rw + Ctr - Standard Thermal Double Glazing	▼	5.8	20	20	19	27	38	37	40	61%	27 (inc Ctr)	-	-
	ATTENUATION													
Glazing 3	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Roof	ROOF / FLOOR	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Resultant composite Façade SRI				24	25	24	31	42	42	44				
Resultant SPL inside room excluding ventilators dB			29.9	18	22	27	23	15	12	5	100%			

Ventilator Type			Num	D _{n,e} dB to BS EN 20140-10:1992									Dnew	C	Ctr
Ventilation				0	0	0	0	0	0	0	0%				
	ATTENUATION														
Ventilation	VENTS			0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%				
Total SPL inside room			29.9	18	22	27	23	15	12	5					



CLIENT: MIDGARD LTD

PROJECT: Sparkle Street, Manchester

ROOM: Living Room (Town House, Ground Floor)

RUN REF: 23244

VARIANT: Daytime Average Noise Levels (LAeq,16hr)

Room Dimensions [m]

W6.8

X

L5.8

X

H3.6

Room Volume = 140.9 m3

Partition Area = 35.5 m2

Ventilation ref area = 10.0 m2

Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>>

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	65.0							
	46.8	50.9	54.4	57.8	61.0	58.2	53.0	Reference spectrum

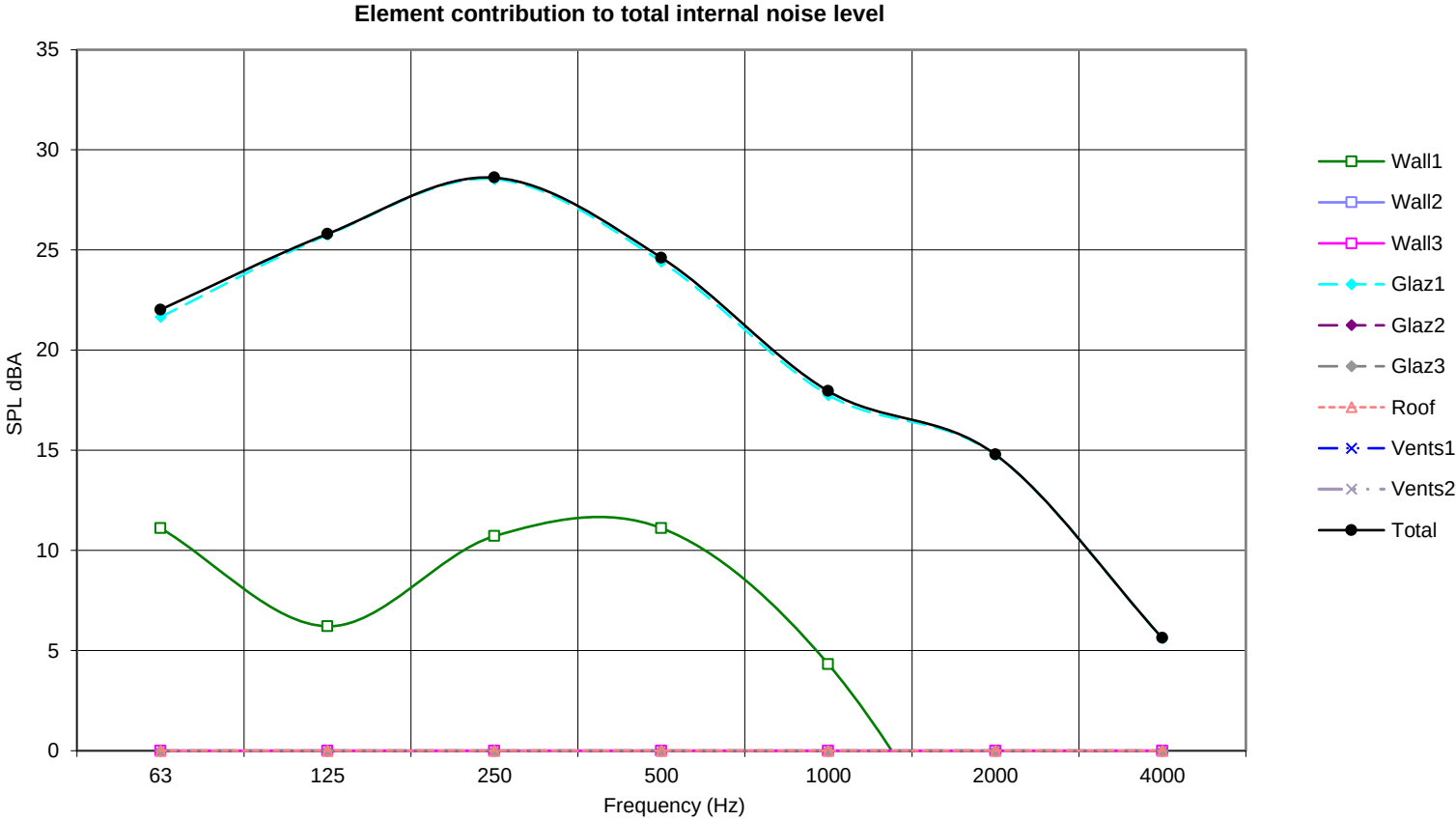
REVERBERATION TIME

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

NOTES:

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	24.3	36	45	44	47	57	67	77	3%	54	0	-4
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	30 dB Rw + Ctr - Acoustically Upgraded Double Glazing	11.2	22	22	23	30	40	40	44	97%	30 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant composite Façade SRI			27	27	28	35	45	45	49				
Resultant SPL inside room excluding ventilators dB			32.2	22	26	29	25	18	15	6	100%		

Ventilator Type		Num	D _{n,e} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation			0	0	0	0	0	0	0	0%			
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%		
Total SPL inside room			32.2	22	26	29	25	18	15	6			

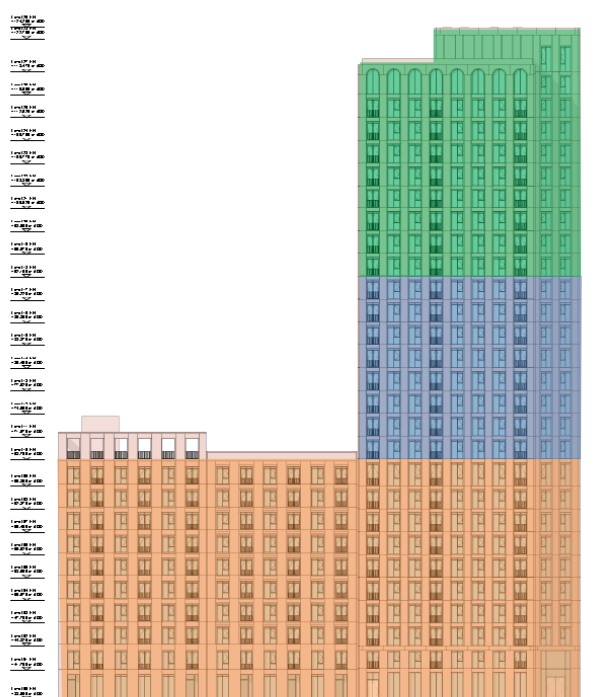


Appendix 5 Outline Acoustic Facade Specification

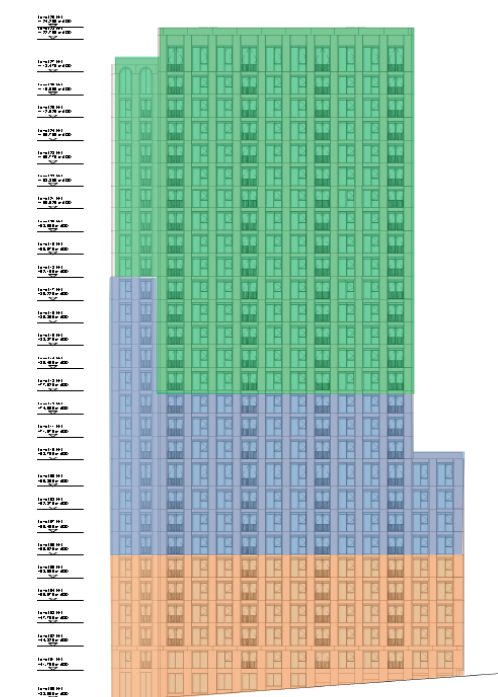
		Bedroom	Living Room
Reference	Colour	Glazing Specification	Glazing Specification
FS01		36 dB Rw+Ctr	30 dB Rw+Ctr
FS02		30 dB Rw+Ctr	27 dB Rw+Ctr
FS03		27 dB Rw+Ctr	

NOTES:

Values must include the Ctr correction. Manufacturers or suppliers should provide laboratory test data demonstrating that the proposed systems are capable of achieving the values given. Windows should be tested as complete systems (rather than just the glazing in isolation).



STORE STREET ELEVATION

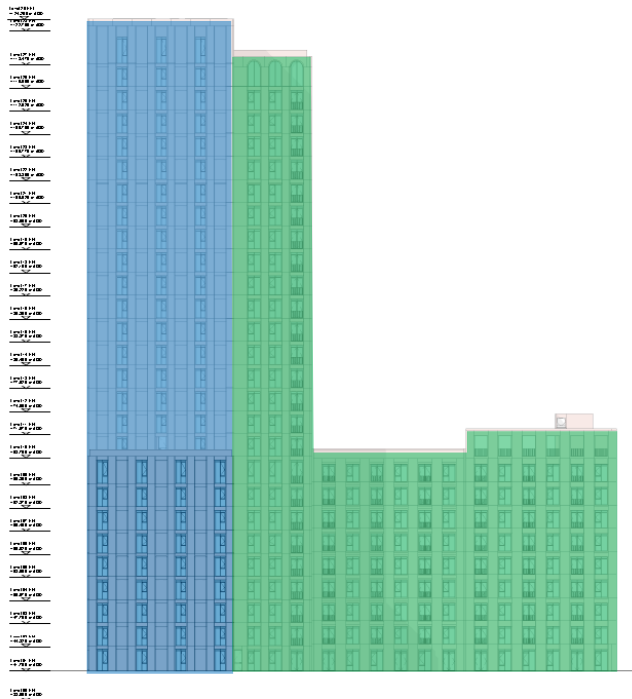


SPARKLE STREET ELEVATION

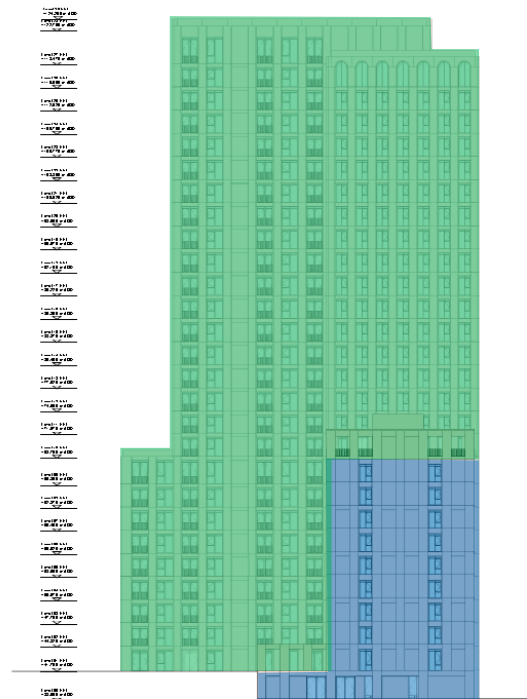
		Bedroom	Living Room
Reference	Colour	Glazing Specification	Glazing Specification
FS01		36 dB Rw+Ctr	30 dB Rw+Ctr
FS02		30 dB Rw+Ctr	27 dB Rw+Ctr
FS03		27 dB Rw+Ctr	

NOTES:

Values must include the Ctr correction. Manufacturers or suppliers should provide laboratory test data demonstrating that the proposed systems are capable of achieving the values given. Windows should be tested as complete systems (rather than just the glazing in isolation).



SOUTHEAST ELEVATION



NORTHEAST ELEVATION



Architectural & Environmental Consultants

Noise | Vibration | Air Quality

This report has been prepared by Cass Allen Associates Ltd in accordance with the CDM regulations with all reasonable skill, care and diligence, and taking account of the resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid at the time of collection. This report is for the exclusive use of the client named above; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from Cass Allen Associates Ltd. Cass Allen Associates Ltd disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of work.



If you have any queries
with this report, please
click here to send us an
email and we will call you
back to discuss