

**Proposed Residential Development
Land at Mariners Way
Rhoose
CF62 3DL**

**Noise Impact Assessment
3478/ENS1**

6th August 2014

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1.0 Introduction

Residential development is planned on land at Mariners Way, Rhoose, CF62 3DL.

The proposed site is located among residential dwellings – along the north, east and western site boundaries. A local Tesco Express shop is located along the southern site boundary with operating plant units at the eastern boundary of the shop. Deliveries to the shop are made along the western boundary.

This report has been commissioned to assess noise emissions from deliveries and fixed services plant on the retail unit to the proposed residential development.

Existing ambient and background noise levels at the proposed site for comparison with current planning guidance.

Appendix A explains acoustic terminology used in this report.

Appendix B contains tables, diagrams and graphs referenced in this report.

2.0 Planning Guidance

2.1 Delivery Noise

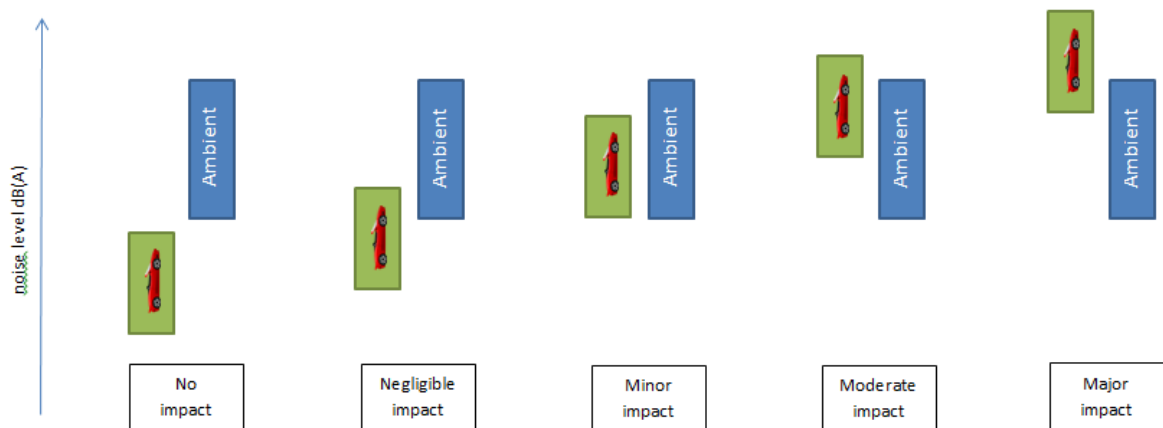
There is no specific recognised methodology for assessing noise emissions from service yard/delivery activities, although it is a known source of potential disturbance and concern for neighbouring residents.

Comparisons between L_{Aeq} source noise and L_{A90} background levels can be made, and are included in this assessment, but should be applied with caution for occasional daytime delivery noise. The L_{Aeq}/L_{A90} comparison detailed in BS4142 is particularly helpful in rating the extent to which a continuous source can be accommodated beneath the fluctuating range of ambient conditions such that it is largely unnoticed. We would suggest noise from occasional deliveries to a retail store can be accommodated within the soundscape, rather than 'hidden' below it.

An assessment methodology has therefore been developed, based on semantic descriptors of impact established in the draft guidelines for Noise Impact Assessment issued by the Institute of Acoustics (IOA), and the Institute of Environmental Management and Assessment (IEMA). In setting the descriptors we have noted delivery noise may have a more noticeable character at this site compared with general traffic noise, but that it also occurs on an occasional basis during the day.

- No noise impact is considered to occur where the range of Delivery noise is entirely below the range of daytime ambient levels (L_{Aeq}).
- Where the range of Delivery noise partially occupies the same range as daytime ambient levels, a negligible impact is considered to occur.
- Where the range of Delivery noise generally occupies the same range as the daytime ambient levels (L_{Aeq}), but does not significantly exceed the higher ambient levels, a minor impact is considered to occur.
- Where the range of Delivery noise generally occupies the same range as the daytime ambient levels (L_{Aeq}), but does exceed the higher ambient levels, a moderate impact is considered to occur.
- Where the range of Delivery noise generally exceeds the daytime ambient levels (L_{Aeq}) a major impact is considered to occur.

These noise impact scenarios are illustrated graphically in the figure below.



Delivery noise has also been assessed in relation to a free-field threshold value of 45dB L_{Aeq} in outdoor living areas. Any impact for levels less than 45dB(A) is limited to negligible or none. This is based on WHO Guidelines for Community Noise that advises in relation to outdoor amenity areas that 'few people are moderately annoyed during the daytime for levels below 50dB L_{Aeq} ' and few people are seriously annoyed by noise level of less than 55dB L_{Aeq} . (It is noted that the WHO criteria are for anonymous noise sources, which delivery noise is not and therefore a more stringent criterion has been applied).

2.2 Fixed Building Services Plant

When assessing noise emissions from fixed plant sources near residential development, local authorities refer to BS4142: 1997 'Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas'. This standard describes a rating method comparing L_{Aeq} noise levels from the industrial source with pre-existing background L_{A90} levels at the residential receiver. It advises at a difference (industrial noise - background) of:

- +10dB or higher, complaints are likely;
- -10dB or lower - complaints are unlikely;
- A difference of + 5dB is of marginal significance.

A + 5dB penalty is applied to the industrial noise level if it exhibits a distinguishable discrete continuous note (whine, hiss, screech, hum, etc.), distinct impulses (bangs, clicks, clatters or thumps), or the noise is irregular enough to attract attention.

3.0 Environmental Noise Survey

3.1 Procedure

Continuous noise monitoring was carried out on 24th July and 4th August 2014, over 24-hour periods. Data including L_{max} , L_{10} , L_{eq} & L_{90} were logged at 5-minute intervals over the monitoring period.

Site plan 3478/SP1 below shows the site and measurement positions used, namely;

Position A Located at the southern site boundary, approximately 12m from plant units with line of sight. Approximately 1.5m above local ground height.

Position B Located approximately 2m from southern site boundary, approximately 2.5m from existing gates. Approximately 1.2m above local ground height.

3478/SP1 – Site Plan Showing Continuous Monitoring Positions



3.2 Equipment

The following equipment was used:

3478/T1 – Equipment List

Make	Description	Model	Serial Number	Last Calibrated	Certificate No.	Calibration Due
Rion	Type 1 - Sound Level Meter	NL-32	01103396	25-Feb-13	1302066	25-Feb-15
Rion	Preamplifier	NH-21	34335	25-Feb-13	1302066	25-Feb-15
Rion	Microphone	UC-53A	317921	25-Feb-13	1302066	25-Feb-15
Norsonic AS	Calibrator (114.11dB @ 1001.90Hz)	1251	31826	16-Sep-13	U14446	16-Sep-14

The measurement systems were calibrated before and after the surveys; no variation occurred.

3.3 Weather Conditions

24th July: Dry and clear with a gentle breeze.

4th August: Dry and clear with a light breeze with showers on the morning of 5th August (between 0500-0800hrs).

4.0 Results

Results of continuous monitoring at Positions A & B are shown in time history graphs 3479/TH1&TH2 in Appendix B respectively.

Minimum consistent daytime and night-time background noise levels measured at position B (not controlled by fixed services plant) are given below;

- Minimum Consistent Daytime L_{A90} Background (0700-2300hrs) 28dB
- Minimum Consistent Night-time L_{A90} Background (2300-0700hrs) 22dB

5.0 Noise Predictions & Discussion

The proposed site layout is shown in 3478/D1 in Appendix B (taken from Arden Kitt Associates Ltd drawing AL.00.002 Rev A. dated 27/03/14). The nearest proposed dwellings to the Tesco store are a pair of semi-detached houses located approximately 1-2m from the southern boundary.

The layout of the dwellings has been designed so that no habitable rooms at first floor level are on the rear façade overlooking the Tesco store (single aspect design).

A minimum 1.8m closed boarded fence / wall is also proposed along the entire southern boundary of the site to the Tesco store to maximise screening to ground floor level.

5.1 Noise from Fixed Plant

Noise from fixed services plant is assessed in line with British Standard 4142:1997 (see section 2.2 of this report).

Noise levels from fixed services plant were measured above the fence line (unscreened) on the southern boundary (position A). As fixed services plant typically runs continuously, the L_{A90} parameter can be used to determine noise levels from fixed services plant within the current noise climate.

These levels are then compared with minimum consistent background noise levels measured at position B (unaffected by fixed services plant) as discussed in section 4.0 above.

Note: A 5dB penalty has not been added to the plant in this assessment as we are aware this was not included in the original plant noise assessment/design for the Tesco store undertaken by KR Associates in report KR01925 V1.1 dated 20/08/2010.

3478/T2 – BS 4142 Assessment

Period		Unscreened Plant Noise L_{A90} at Pos A (dB)	Screening Loss (dB)	Resultant Plant Level at Site Boundary	Minimum Consistent Background L_{A90} (dB)	Excess over Background
Daytime	0700-2300hrs	40	-10	30	28	2dB
Night-time	2300-0700hrs	33	-10	23	22	1dB

Referring to section 2.2, excess levels over background of 2dB and 1dB fall between “Complaints are unlikely” and “Marginal significance.” Noise from fixed services plant is therefore not likely to be an issue at plots along the southern site boundary. It should be noted that dwellings on Mariners Way directly opposite the plant compound are likely to experience similar noise levels.

5.2 Noise from Deliveries

During our monitoring at position B, 4 deliveries were recorded. These occurred at the following times resulting in the unscreened $L_{Aeq,1hr}$ noise levels quoted alongside;

- 1020-1040hrs 51.1dB $L_{Aeq,1hr}$
- 1046-1110hrs 51.1dB $L_{Aeq,1hr}$
- 1452-1514hrs 58.0dB $L_{Aeq,1hr}$ (engine/refrigeration running)
- 1910-1932hrs 51.5dB $L_{Aeq,1hr}$

During each visit, reversing of vans (some white noise/some beeper reversing alarms), opening/closing of doors, moving of roll cages and voices could be heard. We understand that no night-time deliveries occur at this store – please confirm.

Note: During the 1452-1514hrs, the engine/refrigeration unit on the delivery van was left running for the entire duration of the delivery, resulting in a much higher noise level.

With a 1.8m high closed boarded fence/wall along the entire southern site boundary, noise levels to proposed ground floor rear facades would be reduced by around 10dB. Noise levels at proposed first floor facades would not benefit from the same reduction, however the single aspect design of the dwellings means there are no windows to habitable rooms located on the rear façade (see 3478/D2 in Appendix B). Therefore delivery noise to first floor level is not assessed as critical and this assessment focuses on ground floor southern facing facades.

Table 3478/T3 shows predicted delivery noise level ranges ($L_{Aeq,1hr}$) compared to the existing ambient daytime $L_{Aeq,1hr}$ ranges with no delivery noise. The table goes on to assess impact of delivery noise based on the assessment method discussed in section 2.1 of this report.

Comparisons with a 35dB minimum daytime background L_{A90} (taken from the period when deliveries are likely to occur – 0700-2000hrs) and the 45dB(A) threshold level also discussed in section 2.1 are included. Where delivery noise does not exceed the 45dB(A) threshold value, any impact is limited to Negligible or None.

3478/T3 - Comparison of Delivery Noise with Existing Ambient Noise Levels

Receiver	Delivery Noise Level $L_{Aeq,1hr}$ (dB)	Existing Daytime Ambient Noise Level $L_{Aeq,1hr}$ (dB)	Delivery Noise >45dB ?	Delivery $L_{Aeq} - L_{A90}$ Delta * (dB)	Impact
Ground floor at worst case dwelling adjacent to delivery yard on southern boundary	41-48	44-48	No / Yes	6-13	Negligible / Minor Impact

*A daytime L_{A90} of 35dB has been used.

No significant impact is therefore indicated at existing residential receivers from occasional deliveries. With the inclusion of screening to ground floor facades, the majority of deliveries are indicated to result in a negligible impact. Deliveries where the engine/refrigeration unit are left running result in a minor impact.

It should be noted that the existing dwelling located adjacent to the Tesco service yard on Milburn Close is likely to experience similar noise levels and may not benefit from single aspect design.

6.0 Conclusion

A noise assessment has been carried out on land at Mariners Way, Rhoose, CF62 3DL against current planning guidance for residential development. Ambient noise levels are controlled by road traffic on Fontygary Road and air traffic from/to Cardiff International Airport.

An assessment in line with British Standard 4142:1997 has been undertaken to assess noise from fixed services plant at the Tesco store affecting proposed dwellings on the southern site boundary. With line of sight removed by a 1.8m high closed boarded fence/wall along the southern site boundary, both daytime and night-time fixed services noise are indicated to fall between "Complaints are unlikely" and "Marginal significance."

The potential noise impact from Tesco deliveries has also been assessed at the worst case dwelling (proposed at the western end of the southern boundary). With the inclusion of screening discussed above to ground floor facades, the majority of deliveries are indicated to result in a negligible impact. Deliveries where the engine/refrigeration unit are left running result in a minor impact.

Delivery noise to first floor level is not assessed as critical due to the single aspect design of the dwellings on the southern boundary (no habitable rooms on the southern façade overlooking the Tesco store).

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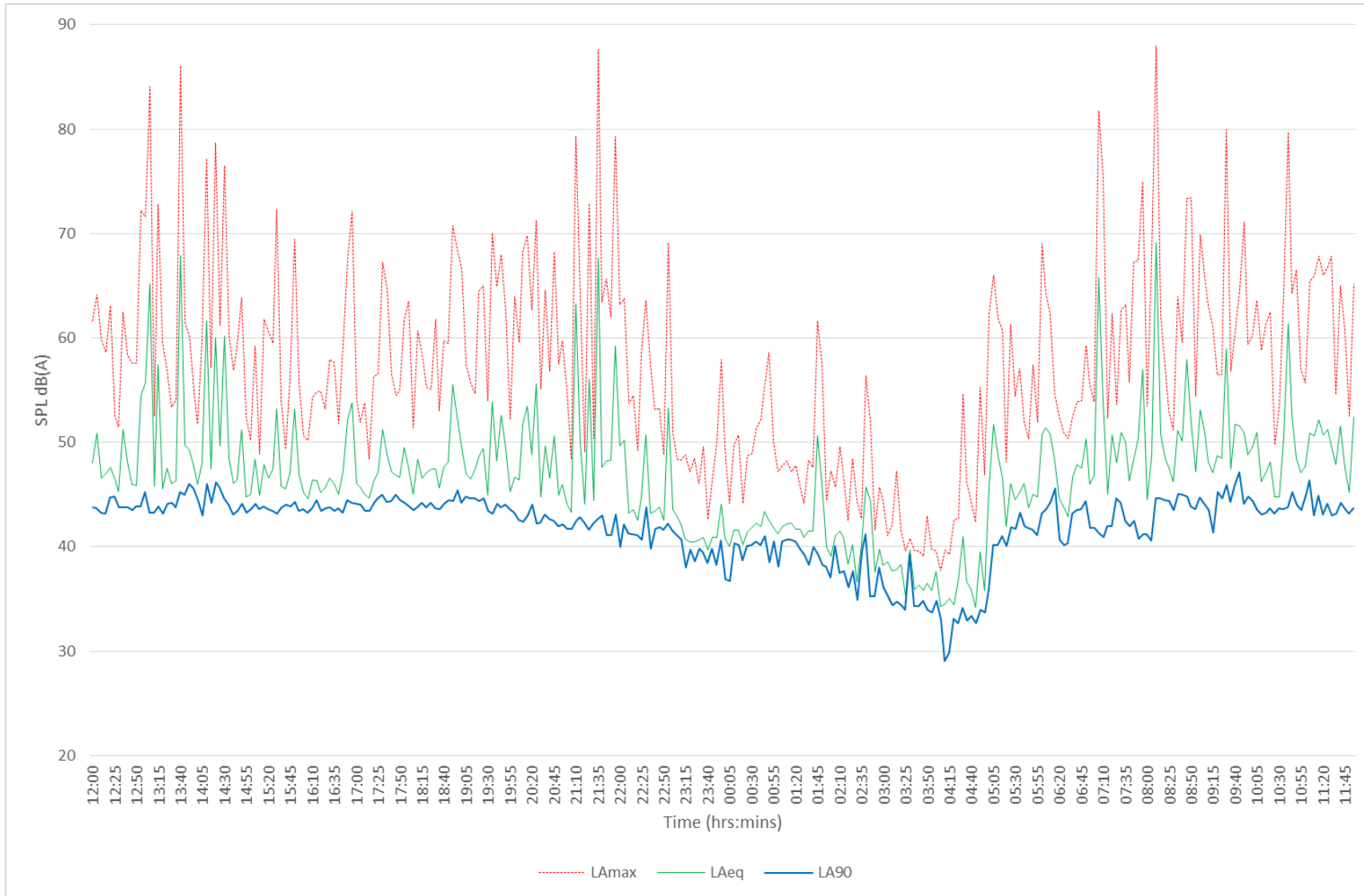
Appendix A – Acoustic Terminology

Human response to noise depends on a number of factors including; loudness, frequency content, and variations in level with time. Various frequency weightings and statistical indices have been developed in order to objectively quantify 'annoyance'. The following units have been used in this report:

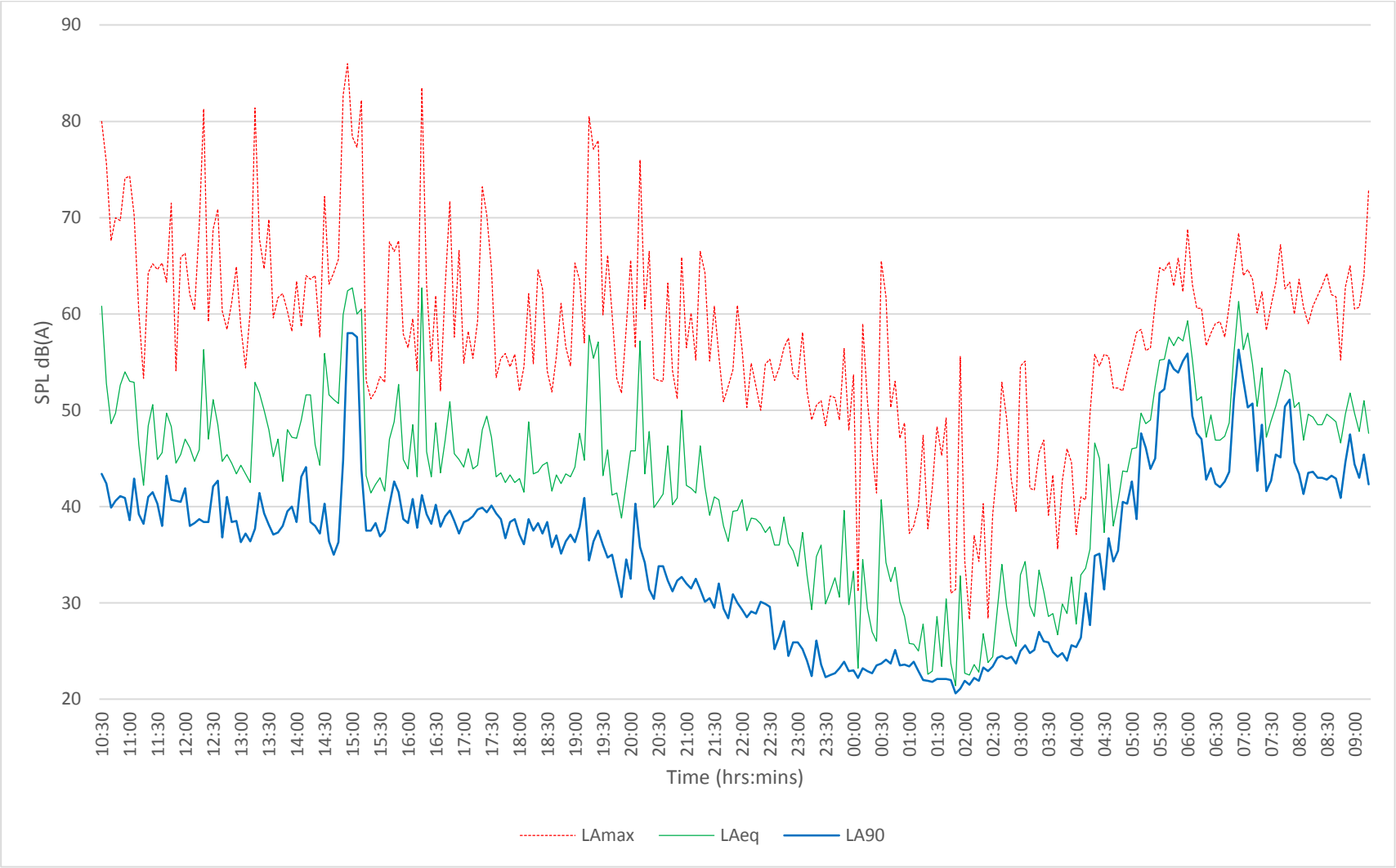
- dB(A):** The sound pressure level weighted to correspond with the frequency response of the human ear, and therefore a person's subjective response to frequency content.
- L_{eq}:** The equivalent continuous sound level is a notional steady state level which over a quoted time period would have the same acoustic energy content as the actual fluctuating noise measured over that period.
- L₉₀:** The sound level which is exceeded for 90% of the measurement period. i.e. The level exceeded for 54-minutes of a 1-hour measurement. It is often used to define the background noise level.
- L₁₀:** The sound level which is exceeded for 10% of the measurement period. i.e. The level exceeded for 6-minutes of a 1-hour measurement
- L_{max}:** The highest instantaneous noise level recorded over the measurement period.
- NSPs:** Noise-sensitive premises

Appendix B – Tables, Diagrams & Graphs

3478/TH1 – Time History Graph at Position A



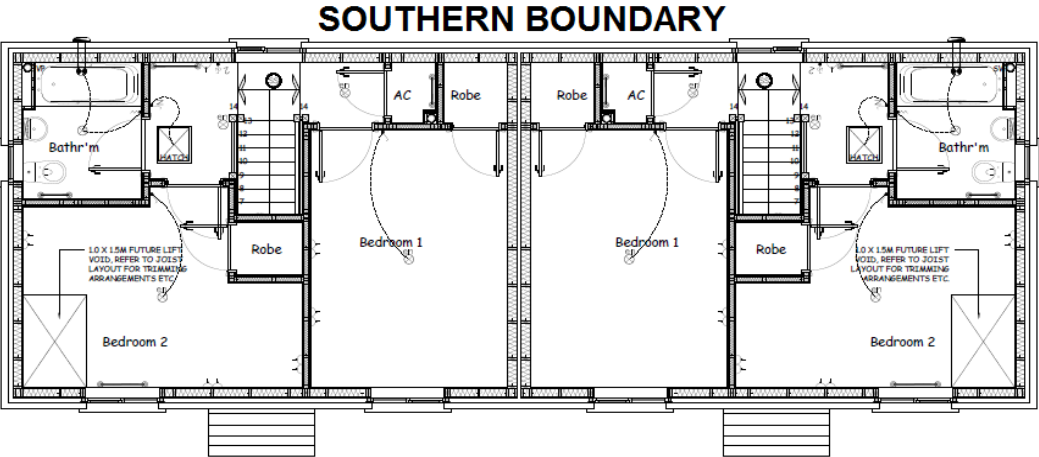
3478/TH2 - Time History Graph at Position B



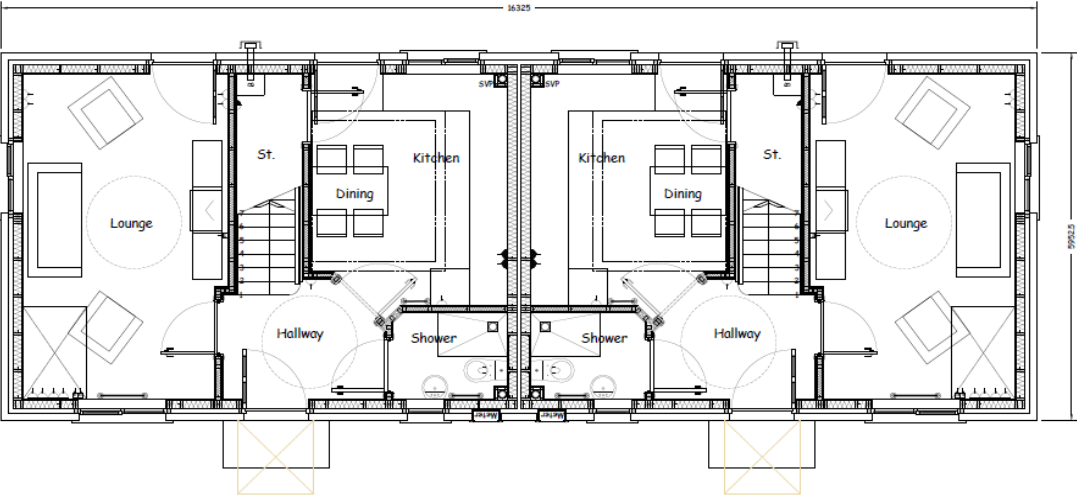
3478/D1 – Proposed Site Layout Plan



3478/D2 – Proposed House Layout Plan Showing Single Aspect Design at First Floor Level



First Floor Plan



Ground Floor Plan