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BARCLAYS HOUSE, EASTLEIGH; NOISE IMPACT ASSESSMENT

CONTENTS

1.0	EXECUTIVE SUMMARY	2
2.0	LOCAL AUTHORITY CONSULTATION	2
3.0	RELEVANT GUIDANCE	3
4.0	SITE DESCRIPTION	4
5.0	SURVEY PROCEDURE AND EQUIPMENT	5
6.0	RESULTS AND DISCUSSION	7
7.0	ASSESSMENT	9
8.0	CONCLUSION	13

LIST OF ATTACHMENTS

AS13600/SP1	Indicative Site Plan
AS13600/TH1-TH15	Environmental Noise Time Histories
APPENDIX A	Acoustic Terminology

Project Ref:	AS13600	**Title:**	Barclays House, Eastleigh
Report Ref:	AS13600.240719.NIA	**Title:**	Noise Impact Assessment
Client Name:	Habtec 3 Ltd		
Project Manager:	Ian MacArthur		
Report Author:	Ian MacArthur		

Clarke Saunders Acoustics Winchester SO22 5BE	This report has been prepared in response to the instructions of our client. It is not intended for and should not be relied upon by any other party or for any other purpose.

1.0 EXECUTIVE SUMMARY

1.1 A Prior Approval application is to be submitted for a change of use from office/commercial use to residential use at Barclays House, 20-24 Upper Market Street, Eastleigh, SO50 9FD.

1.2 Clarke Saunders Associates (CSA) has been commissioned by Habtec 3 Ltd to undertake an environmental noise survey at the site and determine the likely noise impact on future residential occupants.

1.3 Noise levels at site are not particularly high given the location, but the mixed character of the sources requires consideration.

1.4 The site is affected by multiple noise sources, typical of the town centre locality. These include 'anonymous noise' from transportation sources such as taxis, buses, rail and aircraft movements, as well as noise associated with the neighbouring Eastleigh Working Men's Club and Locomotive Engineers Social Club.

1.5 The impact of these noise sources has been assessed against relevant British Guidance and other guidance documents.

1.6 Appraisal of the existing glazing indicates that average daytime and night-time levels from general noise sources, as set out in BS8233: 2014 are likely to be achieved whilst retaining the existing glazing. Whole dwelling mechanical ventilation heat recovery (MVHR) systems are proposed to provide background and higher rates of ventilation, such that windows can remain closed.

1.7 Music breakout from the neighbouring Working Men's Club concert hall was not perceptible at front or rear of the building during the 2024 survey, or during CSA previous surveys undertaken in 2020. Maximum noise levels from patrons using the external seating/smoking area associated with the club and late night voices associated with the taxi rank can be perceptible, and raised voices/shouting may be disturbing if the existing glazing is retained.

1.8 Music breakout from the Locomotive Engineers Social Club during a Karaoke event was audible at the rear of the Site, albeit at a relatively low level during the survey. Louder functions or events in the club may be audible internally in the proposed development with the current retained glazing configuration.

1.9 Secondary glazing fitted to the existing windows would be capable of improving the existing sound insulation of the windows by up to 15-20dB, such that maximum noise levels from pedestrians and impacts from potential louder functions in the Locomotive Engineers Social Club are minimised.

2.0 LOCAL AUTHORITY CONSULTATION

2.1 CSA liaised with Stuart Wedgbury, Environmental Health Specialist at Eastleigh Borough Council via telephone and email on 9/07/2024. The general survey scope and methodology was discussed, with confirmation that internal noise assessments should include reference to the standards in Eastleigh's adopted local plan and BS 8233: 2014 *Guidance on sound insulation and noise reduction for buildings*.

2.2 The main points raised with regard to potential noise impacts at this site were;

- Consideration and analysis of maximum noise levels, Particularly address the potential sources of noise and any uncertainties in relation to survey durations (i.e. taxi/pedestrian activity etc).

- Check licenced activities hours as well as standard operation of adjacent working men's clubs. Discuss any uncertainty regarding types of entertainment/music noise.

- Describe ventilation strategy with respect to noise, and whether any additional background ventilation is required, in addition to proposed mechanical ventilation.

- Include reference to the nearby Sainsbury's proposed plant application for potential noise impact.

2.3 *Specific comments received via email from Mr Wedgbury were;*

"1. Where the source of the L_{Amax} is variable/unpredictable as is likely the case with people noise as opposed to the more typical application to transport noise sources; the design should be conservative and not simply be a design based upon the 10th highest event identified from a short survey.

2. With regard to regulated entertainment, consideration should be given to the lawful use of any existing premises licence or club certificate. It would be helpful to understand what level of music noise might be possible at the façade of the proposed development if a typical pub band played in the Club and how challenging this might be for the acoustic design."

3.0 RELEVANT GUIDANCE

3.1 BS8233:2014 *GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS*

3.1.1 The guidance in this document indicates suitable noise levels for various activities within residential buildings.

3.1.2 The relevant sections of this standard are shown below

3.1.3 *BS8233: 2014 Internal Noise Level Guidelines for Dwellings*

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq, 16 hour}$	-
Dining	Dining Room	40 dB $L_{Aeq, 16 hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16 hour}$	30 dB $L_{Aeq, 8 hour}$

Excerpt from BS8233:2014 [dB ref. 20µPa]

3.1.4 Note 7 accompanying the above table goes on to state:

Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

3.2 PATRON NOISE GUIDANCE

3.2.1 The Working Draft Annex to the *Good Practice Guide on the Control of Noise from Pubs and Clubs* features guidance on patron noise.

3.2.2 Although not formally adopted by the IoA, the guidance is widely referenced and was published in Vol 28 No. 6 of its quarterly journal, Acoustics Bulletin. (The relevant section of this journal issue is appended for the reader's information)

3.2.3 The guidance states the following in respect of 'rowdy behaviour':

If noise from rowdy behaviour regularly produces $L_{Amax,F}$ levels in excess of 70dB 1 metre outside windows of a noise sensitive property between 2300 and 0700 hours, then this may be an indication that unacceptable disturbance could occur or is occurring.

3.3 ADOPTED EASTLEIGH BOROUGH LOCAL PLAN 2022

3.3.1 Section 5.49 of the plan states that *"...in assessing proposals for noise sensitive development, the Council will expect the developer to take into account existing noise levels and foreseeable changes to these. In doing so, developers must avoid significant adverse noise impacts to residential amenities. Development proposals should ensure that they mitigate and minimise adverse noise impacts and, where possible, contribute to the improvement of health and quality of life."*

3.3.2 The standards detailed for maximum ambient noise levels for dwellings subject to transportation noise are based upon on Table 4 of BS8233:2014 as detailed above, with the additional following requirements for bedrooms;

1. *Individual noise events must not normally exceed 45 dB L_{Amax} (measured with fast time-weighting) during the night time.*

2. *Provision of suitable means of sound attenuating ventilation to allow for the fact that opening windows will render noise insulation ineffective*

4.0 SITE DESCRIPTION

4.1 The site is located in the town centre of Eastleigh between Upper Market Street and Station Hill.

4.2 The existing building comprises a four-storey central core with a two-storey extension to the front and a single storey extension to the rear. The current use class of first to third floors is B1(A) (Offices), whilst the ground floor is understood to be consented as A2 Financial and professional services. The ground and first floors are currently vacant, with 2nd – 3rd floor offices occupied.

4.3 The site fronts onto Upper Market Street, a one-way thoroughfare that features a taxi rank and bus station alongside. Taxis and buses were observed to be idling during the site visits. Traffic movements on Market Street are relatively light, and as such, there is not a constant flow of traffic.

4.4 Eastleigh railway station is around 150 metres south west of the site. There is no line of site to the railway track due to screening from other buildings on Station Hill.

4.5 A rooftop carpark is situated on top of Sainsburys, around 30 metres west from the front façade. There are a number of plant items located within the Sainsburys car park.

4.6 The rear extension currently houses mechanical services plant on its roof, directly outside the first floor.

4.7 The site is located just over 1 km from Southampton Airport and is in proximity to the northern flight path for aircraft arriving and departing. Inspection of the latest (2023) published noise data for the airport[1] indicates that the site lies outside of the $L_{Aeq16hr}$ 51 dB contour.

4.8 The Eastleigh Working Men's Club is located to the north west of the site, with a small covered outdoor seating area located a few metres from the west façade. The working men's club is a licensed venue featuring various types of entertainment across the year, including both live and televised entertainment.

4.9 The outdoor seating area features a small polycarbonate roof and a trellis fence separating it from the site.

4.10 The Locomotive Engineers Social Club (the 'Loco') is located to the east of the site at 18 Station Hill. The rear of the Club contains a large function room area at 1st floor level which is also licenced for various types of entertainment including recorded music events (i.e. Karaoke, disco etc.) and live music events. The venue is located approximately 15m from the main rear façade of the site.

5.0 SURVEY PROCEDURE AND EQUIPMENT

5.1 An environmental noise survey was undertaken between 12.00hrs Thursday 11th July and 09.15hrs Tuesday 16th July to undertake site observations and measurements.

5.2 The following equipment was used during the course of the survey:

- 1 no. Rion data logging sound level meter type NL32;
- 2 no. Rion data logging sound level meter type NL52;
- 2 no. Norsonic sound level meters type 118;
- 1 no. Norsonic sound level calibrator type 1251.
- 1 no. Rion sound level calibrator type NC74.

5.3 The calibration of the sound level meters was verified before and after use. No calibration drift was detected.

5.4 The weather during the survey was generally dry. Wind speeds through the survey were light, typically less than 10mph. There were periods of rain throughout Monday 15th July, however, this does not appear to have significantly affected measured noise levels on that day.

5.5 Please refer to Appendix A for details of the acoustic terminology used throughout this report.

[1] https://www.southamptonairport.com/media/nupnzc00/sou-noise-report-2023.pdf

5.6 ENVIRONMENTAL NOISE SURVEY

5.6.1 A survey of the existing sound climate at site was undertaken at the three locations shown in site plan AS13600/SP1. Measurements of consecutive 5-minute L_{Aeq}, L_{Amax}, L_{A10} and L_{A90} sound pressure levels were taken at three positions, LT1, LT2 and LT3.

5.6.2 Position LT1 was representative of façades closest to the working men's club and recorded audio samples of higher noise level events, and at regular 10-minute intervals in order to determine the source of maximum noise events and to identify any other audible background noise sources.

5.6.3 Position LT2 was positioned at second floor roof level, overlooking the road, taxi and bus station. Position LT3 was positioned 1.5m above the rear roof overlooking the rear of the Locomotive Engineers Social Club.

5.6.4 Measurements were made following procedures in BS 7445:1991 (ISO1996-2:1987) Description and measurement of environmental noise *Part 2 - Acquisition of data pertinent to land use*.

5.7 GLAZING APPRAISAL

5.7.1 It is understood that the existing glazing at site may be retained as part of the change of use.

5.7.2 An appraisal of the in-situ sound insulation offered by the existing glazing was undertaken on 11th July 2024. Synchronous 30-second external and internal noise measurements were undertaken to determine the sound insulation performance of the existing glazing at the ground floor frontage of the building.

5.7.3 Additional 5-minute measurements, synchronous with the external monitors, were undertaken at a number of west facing rooms at first floor level and within the second floor meeting room.

5.7.4 These supplement previous tests undertaken by CSA in September 2020, which showed an in-situ sound reduction performance of second floor front windows to be approximately 27dB D_w,

5.7.5 Internally-generated noise was sufficiently suppressed during measurements, such that it did not significantly contribute to the measurement of external noise ingress in the frequency range 100Hz-3150Hz.

5.8 SOUND INSULATION TESTS

5.8.1 Investigative Airborne and Impact sound insulation tests were undertaken between ground and 1st floor areas[2] at the front and rear of the building in order to determine the sound insulation properties of the separating floor structure. The suspended ceiling at ground floor was partially removed, and the floor structure appears to be of concrete beam and block based construction. A raised access floor forms the flooring finish

[2] Tests were undertaken following procedures within BS EN ISO 140-4: 1998 *Acoustics – Measurement of sound insulation in buildings and of building elements – Part 4: Field measurements of airborne sound insulation between rooms* and BS EN ISO 140-7: 1998 *Acoustics – Measurement of sound insulation in buildings and of building elements – Part 7: Field measurements of impact sound insulation of floors.*

system at 1st floor level. Inspection above the ceiling at 1st floor level suggests that this concrete based construction is consistent through the building.

5.8.2 The airborne sound insulation tests showed that the floor achieved a minimum performance rating of $D_{nT,w}$ + C_{tr} 53dB. The impact sound insulation tests (undertaken directly onto the raised access floor with no soft floor coverings) showed an impact sound insulation rating of $L'_{nT,w}$ 47dB.

5.8.3 These results are more than 10dB better than the minimum building regulations requirements for sound insulation between dwellings formed by a material change of use. No significant improvements to the vertical sound insulation would therefore be required to be incorporated into the future development, although suitable acoustic design and detailing would be recommended for internal fit out, to ensure the required levels of internal sound insulation are achieved.

6.0 RESULTS AND DISCUSSION

6.1 ENVIRONMENTAL NOISE SURVEY RESULTS

6.1.1 Figures AS13600/TH1-TH15 show the L_{Aeq}, L_{Amax}, L_{A10} and L_{A90} sound pressure levels as time histories at the three monitoring positions.

6.1.2 The sound climate at the site is primarily determined by traffic noise in the surrounding streets together with contribution from existing plant in the area. Other notable contributions include noise from incoming and outgoing aircraft from Southampton Airport, taxis and buses idling, pedestrians on Upper Market Street and patrons using Eastleigh Working Men's Club. A site visit on the evening of Saturday 13th confirmed audible levels of music to be emanating from the rear function area of the Locomotive Engineers Social Club.

6.1.3 It is noted that on the evening of Sunday 14th July, the English football team were playing in the European Cup Final, with the match finishing around 10pm. General pedestrian and patron noise associated with the adjacent venue was increased on this evening until approximately 00:45 during this time. This could be considered atypical of a normal Sunday evening, but could be representative of a busier 'event' occurring in the immediate environs or at the working men's club.

6.1.4 A summary of the overall noise levels at the measurement positions are given in the table below.

6.1.5 *Measured Noise Levels at long term positions*

Measurement Location	Period	Typical^ Background Sound Level, $L_{A90,5\ mins}$	Average Noise Level, $L_{Aeq,T}$	Typical* Highest Maximum Noise Level, $L_{AF,max}$
LT1	Daytime (07:00 – 23:00hrs)	48 dB	57 dB	n/a
	Night-time (23:00 – 07:00hrs)	42 dB	54 dB	74 dB
LT2	Daytime (07:00 – 23:00hrs)	49 dB	58 dB	n/a
	Night-time (23:00 – 07:00hrs)	41 dB	55 dB	73 dB
LT3	Daytime (07:00 – 23:00hrs)	47 dB	55 dB	n/a
	Night-time (23:00 – 07:00hrs)	40 dB	49 dB	68 dB

Measured noise levels at long term monitoring positions [dB ref. 20μPa]

^Typical is defined in this instance by 10th percentile of L_{A90} dataset

* Typical is defined in this instance by 90th percentile of L_{AFMax} dataset

Road Traffic Noise Levels

6.1.6 The general traffic noise levels at the front façade of the building though the day and nighttime periods are relatively modest, owing to the low traffic flows and slow vehicle speeds. Individual maxima vary depending on vehicle type. Occasional loud exhausts were audible at night, which appeared to be from motorbikes or modified cars. Analysis of the audio files showed that these occurred around 2-3 times on average between the hours 23:00-0700. These events were generally measured at LT2 to be between 70-80dB $L_{Amax,}$ with the loudest at 82dBL_{Amax}..

Night Time Noise Maxima

6.1.7 Night time maximum noise levels above 70dBL_{Amax} as measured at the west facades were correlated with audio recordings to identify the source.

6.1.8 In the early morning dawn hours (i..e 04:00-07:00), these maxima were typically observed to be due to seagull calls, with the remainder typically early morning vehicle movements.

6.1.9 Between 23:00-04:00, maxima above 70dB(A) were either due to pedestrian activity (from patrons leaving the adjacent working club or occasional loud voices from pedestrians accessing a taxi), or due to louder vehicle exhausts as described above.

6.2 GLAZING APPRAISAL RESULTS

6.2.1 The existing glazing is generally formed from standard office double glazing with metal frames. The majority of the windows have openable upper elements, and were observed to be fitted with “brush” type seals.

6.2.2 The windows on the ground floor frontage (former bank) are larger, with smaller high level opening elements.

6.2.3 An external-to-internal weighted level difference of D_w 28 dB was measured at the ground floor, based on one-third octave band level difference data.

6.2.4 The 1st and second floor measurements indicated a range of performance between D_w 26-28 dB. Previous appraisals in 2020 showed a comparable performance of D_w 27dB.

6.2.5 The performance is consistent with standard double glazing openable units fitted with brushed type seals.

6.2.6 Although it was not possible to measure facade performance at other areas of the building, including the rear, the glazing frame and type appears to be consistent throughout, and all units would be expected to achieve a similar sound insulation performance based on the glass configuration.

7.0 ASSESSMENT

7.1 INTERNAL NOISE LEVELS – ANONYMOUS NOISE

7.1.1 Based on the one-third octave band level difference data resulting from the glazing appraisal exercise and long-term external survey data from positions LT1, internal daytime and night-time noise levels are currently predicted as follows:

7.1.2 *Predicted Internal Noise Levels- retained glazing, no mitigation*

Facade	Predicted Internal Noise Level		
	Daytime, $L_{Aeq,16hour}$	Night-time, $L_{Aeq,8hour}$	Night-time, $L_{Amax,fast}$
West Facing – Extension	31	28	45
West Facing – Main Building	30	27	45
Rear Facades	27	20	40

[dB ref. 20µPa]

7.1.3 These levels would achieve the BS8233 guidance levels for daytime rest and sleeping in bedrooms at night.

7.1.4 Internal night-time maxima, based on the typical highest maximum noise level measured (74dBL_{Amax}) would be expected to be $L_{Amax,fast}$ 45 dB.

7.1.5 Transportation noise maxima at the facades of the development do not typically exceed this 74dBL_{Amax} assessment level at night, other than the occasional event from a vehicle with an abnormally loud exhaust. The survey suggested that over the long weekend period, these may occur 2-3 times over the night period.

7.1.6 Internal noise levels from anonymous transportation noise in east-facing rooms at the rear of the building can safely be expected to be well below the BS8233 guidance figures.

7.2 EASTLEIGH WORKING MENS CLUB – MUSIC

7.2.1 The band stage is located in a building towards the rear of the club, as indicated in the attached site plan. This part of the club does not adjoin Barclays House and is separated from the same by the club's snooker hall.

7.2.2 Previous discussions with management indicate that solo performers and duos are typical for the club, with four-piece amplified bands also occasionally performing. Program material is typically lighter rock music, with covers from the 60's, 70's and 80's. 'Extreme' music generating very high noise levels is not a feature of the venue.

7.2.3 A live solo music event occurred inside the neighbouring Eastleigh Working Men's Club between approx. 20:30 – 23:00 on Saturday 13th July. No music noise breakout was audible at the monitoring location during this time.

7.2.4 This is consistent with previous site observations made in September 2020, where music breakout was not perceptible at the monitoring position during this time from this venue.

7.2.5 Inspection of the club's premises licence indicates that live music is permitted on Saturdays only, between the hours 20:00 - 23:30.

7.2.6 The band stage is located in a building towards the rear of the club, as indicated in the attached site plan. This part of the club does not adjoin Barclays House and is separated from the same by the club's snooker hall.

7.3 PATRON NOISE

7.3.1 The Eastleigh Working Men's Club general opening hours are advertised as 11:00 – 15:00 and 19:00 - 23:00 on Monday to Thursday, 11:00 – 15:00 and 18:00 - 23:30 on Fridays, 11:00 – 23:30 on Saturdays, and 12:00 – 23:00 on Sundays. The premises licence indicates the club is permitted to be open for the sale of alcohol until 01:30hrs, seven days per week.

7.3.2 Observations made on site during the surveys suggested that normal talking voices from patrons sat outside the venue are at a relatively low level outside the façade of the 1st floor Site windows.

7.3.3 Analysis of audio recordings against the monitoring data at position LT1 suggests that normal voices generally remain below around 65dB $L_{Amax.}$

7.3.4 Louder raised or shouting voices from this area were shown to be between 70-78dB L_{Amax}. This is particularly evident on the evening of Sunday 14th , during and after the England football match until 00:30hrs.

7.3.5 Periods of raised or shouting voices in the night-time periods were not frequent during the survey, which captured Friday and Saturday nights. Example events found were;

i. A ~5 minute period of loud voices associated with small group of people accessing a taxi at 02:20hrs on the Saturday morning

ii. Brief period raised voices 23:35 Saturday night

iii. 2-3 minute period raised voices 23:55 Saturday night

iv. Brief shriek at 00:07 hrs Sunday Morning

v. Male voice laughter 02:07hrs Sunday Morning

vi. Periods of louder raised voices before, during and after the England football match on Sunday evening

7.3.6 The working men's club is only open post-23:00 hours on two nights of the week and then for only half an hour. Patron noise will therefore likely to be largely confined to pre-23:00 hours.

7.3.7 The general activity in the area of the taxi rank did not appear to generate a significant amount of noise or pedestrian activity. The survey captured a normal Friday and Saturday night period for Eastleigh Town Centre, albeit the Sunday would likely have been busier than otherwise owing to the England football event.

7.3.8 In summary, late night pedestrian noise associated with the taxi rank and normal patron voices from the adjacent club could be audible within the proposed development, with the retained existing glazing, although it would be at a low level.

7.3.9 Raised voices or shouting during busier club events, or from occasional late-night taxi rank activity is likely to be clearly audible internally with the retained existing glazing.

7.3.10 Improved acoustic glazing systems, or more effective secondary glazing to the existing windows would significantly reduce the level of these sources internally.

7.4 LOCOMOTIVE ENGINEERS SOCIAL CLUB

7.4.1 Normal opening hours for the Locomotive Engineers Social Club are not published, however, the premises licence indicates the club is permitted to be open until 01:00hrs, seven days per week for the supply of alcohol.

7.4.2 The licence allows recorded music until 00:30hrs on Fridays and Saturdays, and until 23:00hrs Sunday-Thursday. Live music indoors is permitted until 00:30 hours on Fridays and Saturdays, and 11:30hrs on Sundays.

7.4.3 Direct observations were undertaken during a site visit the early evening of Saturday 13th July at around 21:30hrs. Karaoke music was being played at relatively high volume within the function area, and the rear exit door and side windows were observed to be open. Music was audible at the rear of the site.

7.4.4 Measurements at the rear of the site at position LT3 generally showed levels to be in the mid-50's L_{Aeq} during this time period.

7.4.5 Based on the currently installed glazing being retained, this level of music activity will likely be barely audible, or just audible in rear facing rooms on all levels with windows closed, but at a level in the low 20's dB L_{Aeq}.

7.4.6 The observed event appeared to have ceased by 23:00hrs, and in this context would not appear to represent a significant impact on the proposed residential dwellings, however, potential music from live bands in this function area could potentially be louder, particularly if the rear doors and windows are utilised for ventilative purposes.

7.4.7 Based on the site observations and CSA's experience of ranges of entertainment noise levels, a live band within the function area could have the potential to be louder, in the order 5-10dB overall.

7.4.8 It is likely that louder events or more frequent events past 23:00 could result in adverse impacts to future residents with the retained glazing, and could also therefore result in operational constraint being placed upon the club.

7.4.9 Improved replacement acoustic glazing systems, or more effective secondary glazing to the existing windows would significantly reduce the level of these potential sources internally.

7.4.10 As an indicative guide, a well fitted secondary glazing system comprising 6mm glass with a 100mm cavity to the primary glazing could increase performance of the existing glazing system by 15-20dB at mid frequencies (speech etc) and 10-15dB at lower frequencies (music/exhaust etc).

7.5 VENTILATION

7.5.1 This assessment has been based upon the windows of the proposed development remaining closed. Mechanical ventilation and heat recovery (MVHR) units are understood to be proposed for individual flats in the development, to provide background and higher rates of ventilation. Windows can remain openable at users discretion or for purge ventilation purposes.

7.5.2 MVHR units should be selected and designed such that internal ambient noise levels from fan/airflow sources are suitably controlled, as well as external noise break in through the system where ducted to noiser facades. This may require provision of attenuated duct sections or small duct silencers. Suitable guidance on internal levels is provided in BS8233:2014 and the ANC Acoustics, Ventilation and Overheating guide[3].

7.6 SAINSBURYS CAR PARK PLANT

7.6.1 There are currently several external refrigeration plant items located on the south west side of Sainsbury's car park. This plant was just audible at site from 2nd floor level and forms part of the general mixed background noise climate in the area.

7.6.2 Planning application F/24/97452 details plans for replacement plant, which is located on the east side of the car park. A noise impact assessment was submitted with the application (report ref 91757/NIA), which predicted plant rating level of $L_{Ar,Tr}$ 41dB at the offices opposite on Upper Market Street, a distance of 25m from the plant location.

7.6.3 Barclays House higher west facing facades are located approximately 40m from the proposed plant area. Plant rating level would be reduced to $L_{Ar,Tr}$ 37dB at this distance. This is 4-5dB below the lower nighttime background L_{A90} levels measured at the site and would not, therefore, represent any significant adverse noise impact.

[3] https://www.association-of-noise-consultants.co.uk/avo-guide/

8.0 CONCLUSION

8.1 A survey of the existing sound climate at site was undertaken at Barclays House, 20-24 Upper Market Street, Eastleigh between 12:00 hours on Thursday 11th July 09:15 hours Tuesday 16th July 2024, to determine the likely noise impact on future residential occupants.

8.2 An appraisal of the existing glazing performance and internal sound insulation of separating floors was also undertaken.

8.3 Data, accompanying observations and audio records have been used to determine the likely noise impact on future residential occupants of the building.

8.4 The site is affected by multiple noise sources typical of the town centre locality. These include 'anonymous noise' from transportation sources such as taxis, buses, rail and aircraft movements, as well as noise from patrons associated with the neighbouring Eastleigh Working Men's Club, pedestrians accessing taxis and music sources from the function room of the adjacent Locomotive Engineers Social Club.

8.5 Transportation noise levels at site are not particularly high given the location, but the character of some of the other noise sources requires specific consideration.

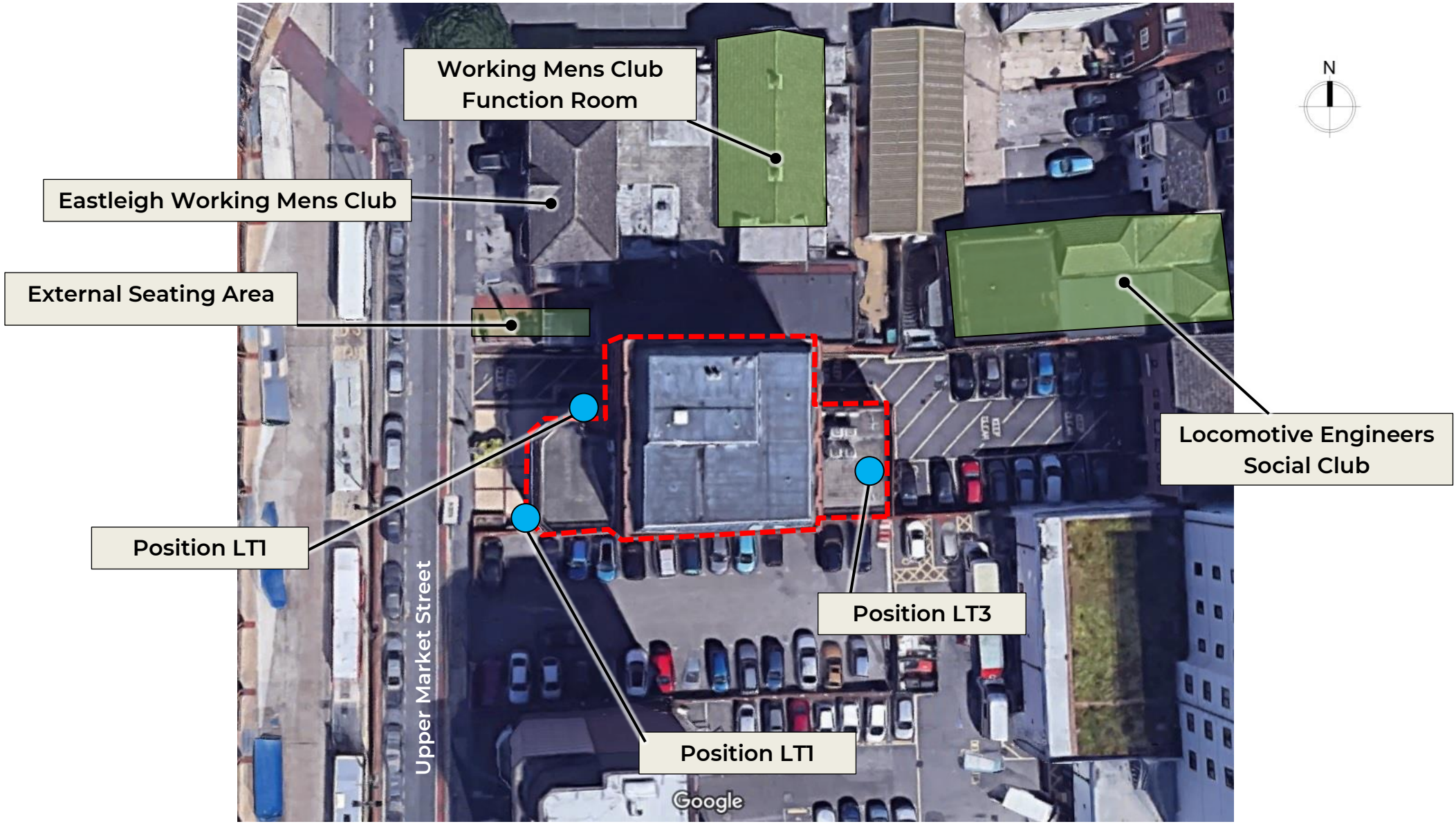
8.6 The assessment indicates that the relevant guidance levels as set out in BS8233: 2014 for transportation noise sources can be achieved by the existing glazing.

8.7 Music breakout from the neighbouring Eastleigh working men's club concert hall was not perceptible at the site during the survey.

8.8 With retained glazing, nighttime pedestrian and patron activity has the potential to be audible internally on west facing facades, with louder occasional events potentially at a level which could cause disturbance to future residents. This could also impose a constraint on the activity of the club in the future. Improved performance glazing, or secondary glazing would satisfactorily mitigate these impacts.

8.9 With retained glazing, music breakout from the Locomotive Engineers Social Club has the potential to be audible within rooms on the east façade of the building. Improved performance glazing, or provision of secondary glazing would minimise potential impact or potential constraint on the use of the Club.

Ian MacArthur MIOA
CLARKE SAUNDERS ACOUSTICS


Working Mens Club
Function Room
Eastleigh Working Mens Club
External Seating Area
Position LT1
Position LT1
Position LT3
Locomotive Engineers
Social Club
Upper Market Street
Google
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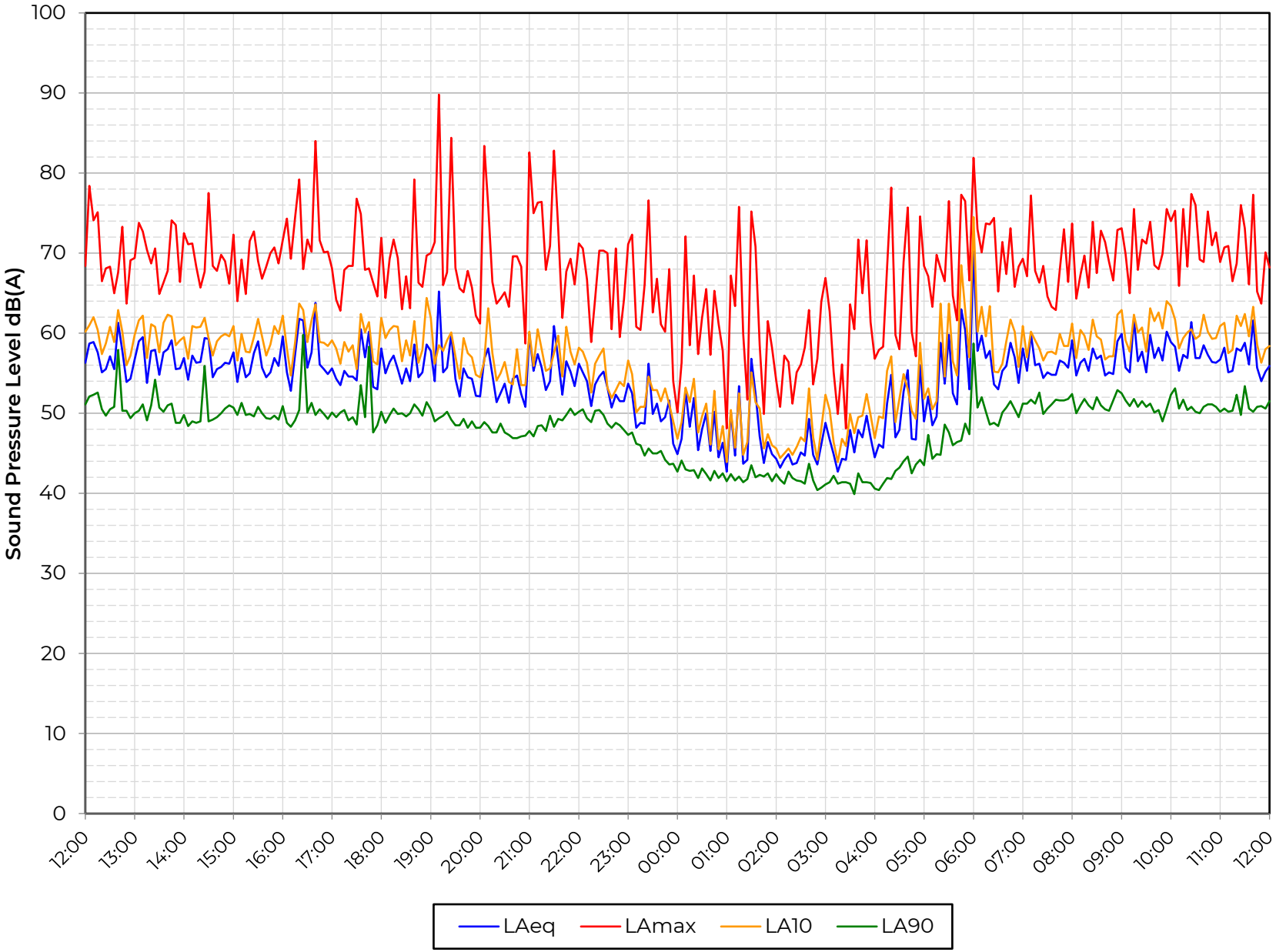
Barclays House

Position LT1



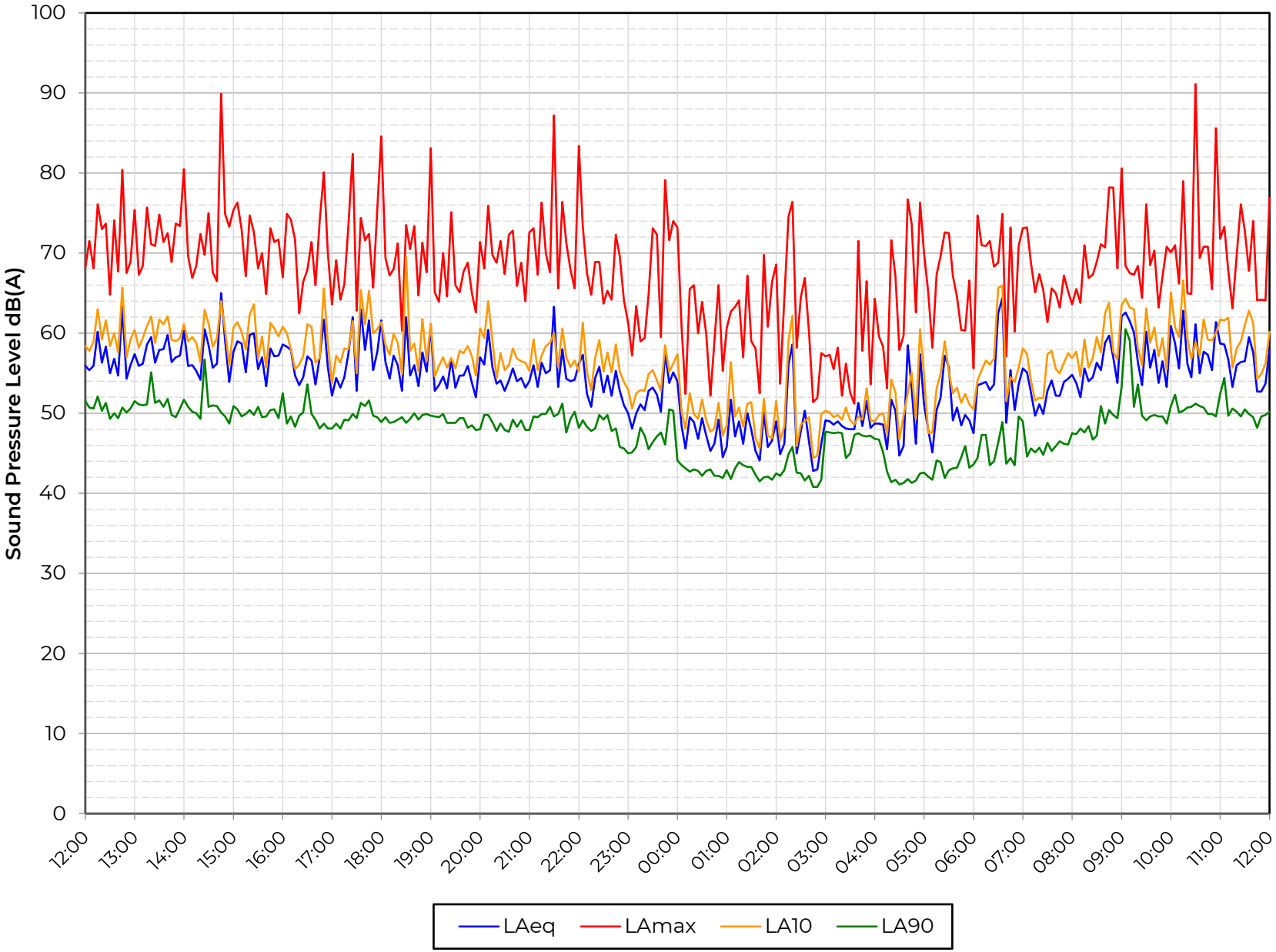
Thu 11 Jul to Fri 12 Jul

Figure AS13600/TH1

clarke saunders acoustics

Barclays House

Position LT1



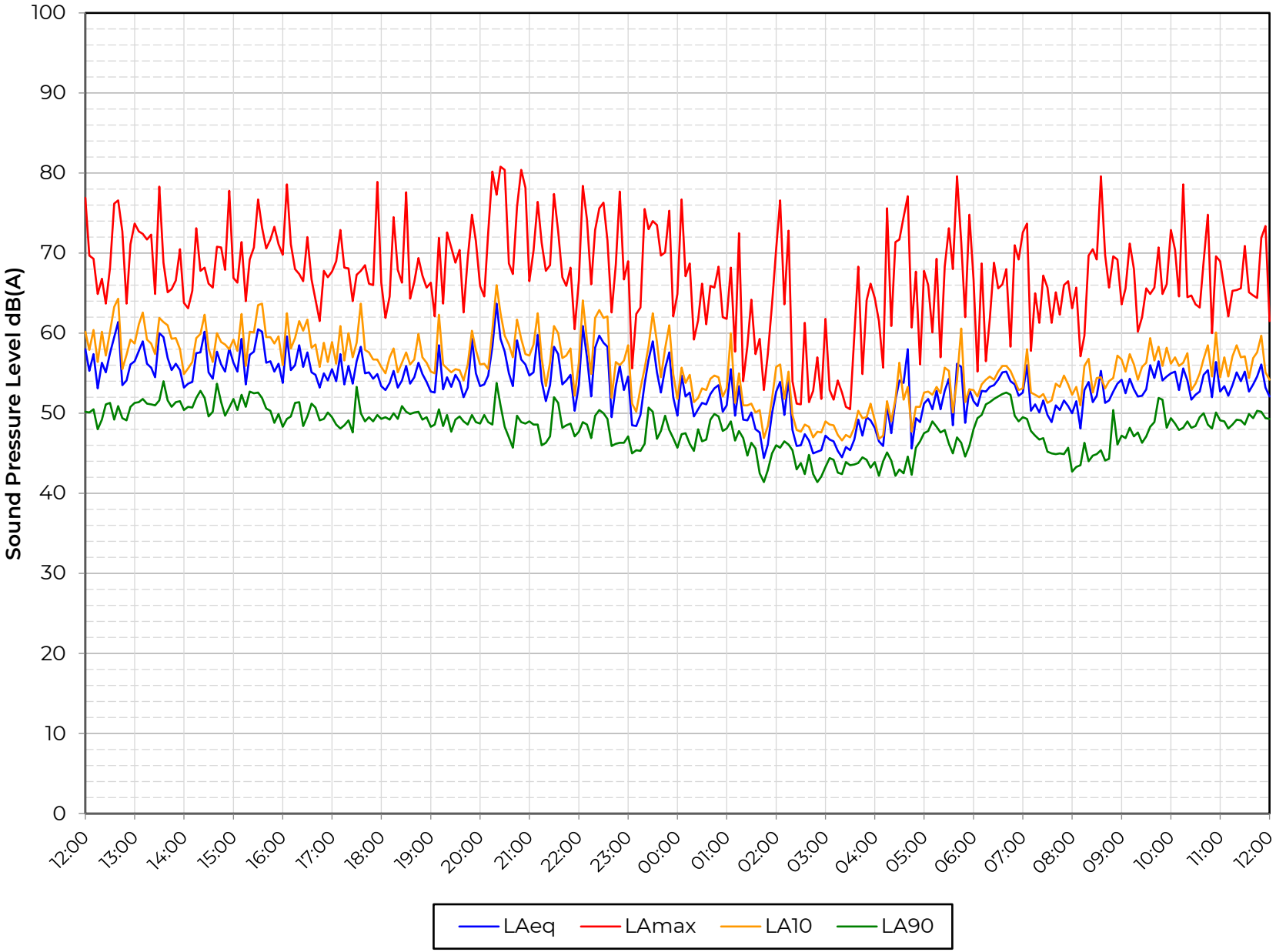
Fri 12 Jul to Sat 13 Jul

Figure AS13600/TH2

clarke saunders acoustics

Barclays House

Position LT1



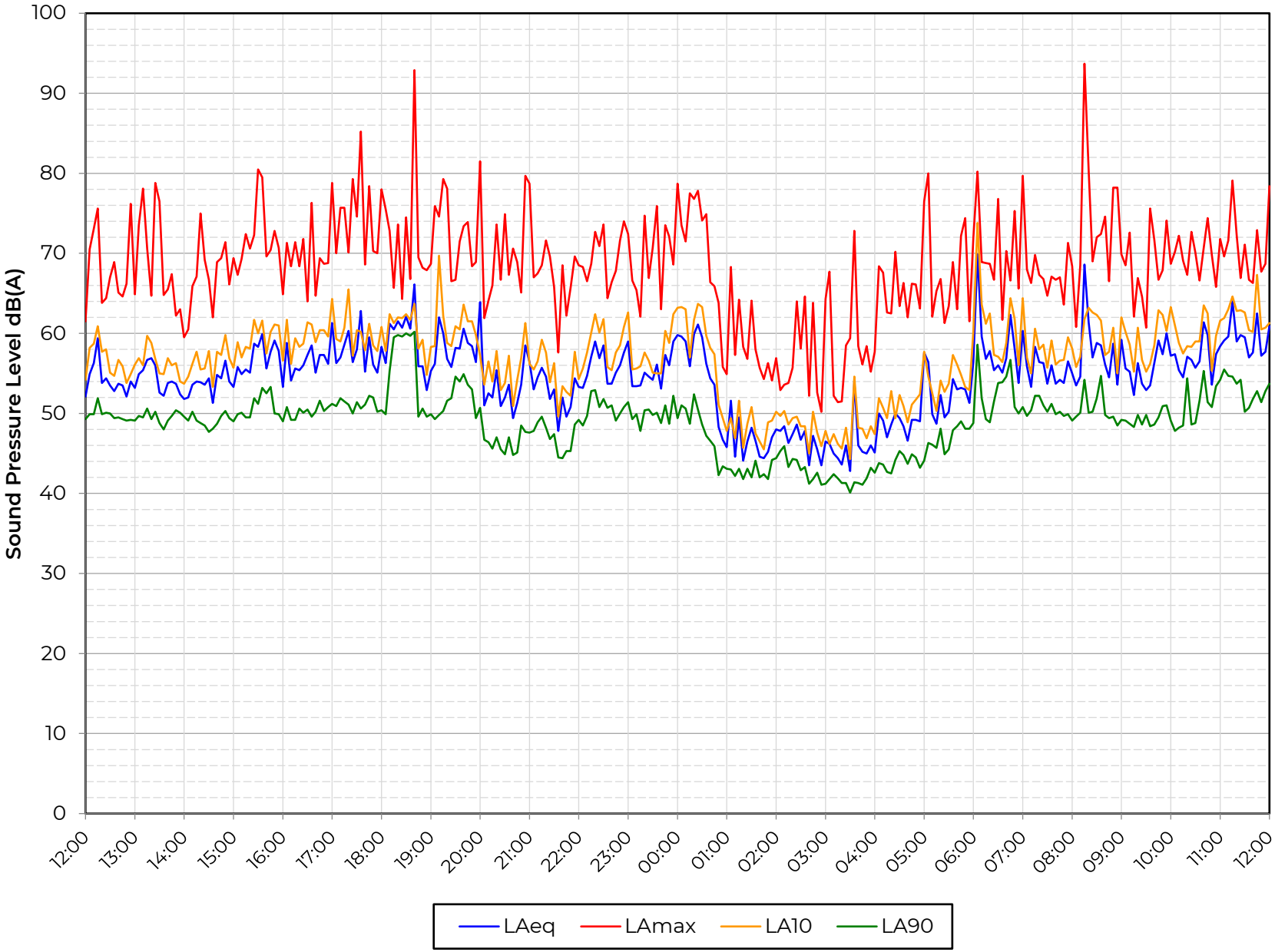
Sat 13 Jul to Sun 14 Jul

Figure AS13600/TH3

clarke saunders acoustics

Barclays House

Position LT1



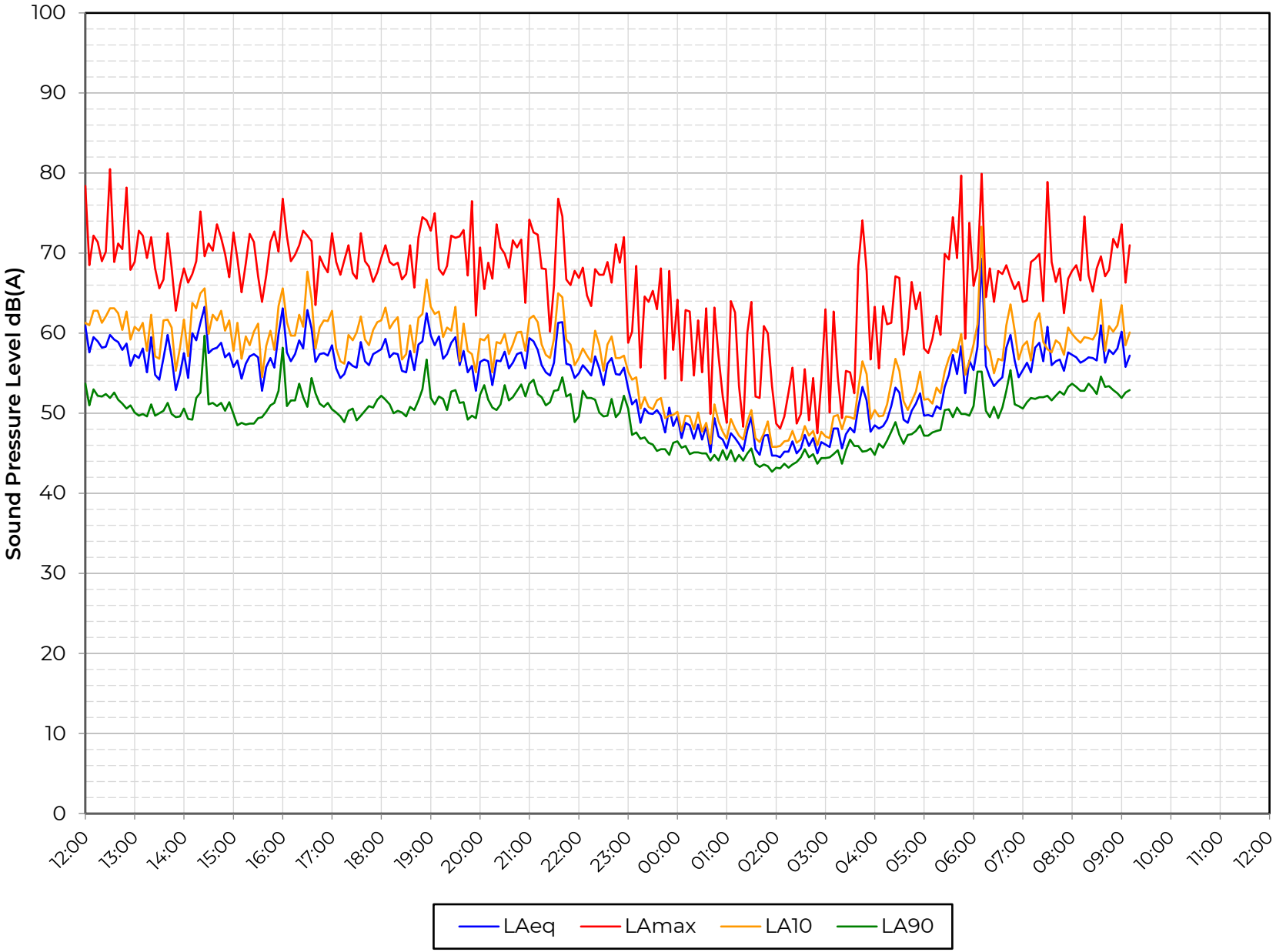
Sun 14 Jul to Mon 15 Jul

Figure AS13600/TH4

clarke saunders acoustics

Barclays House

Position LT1



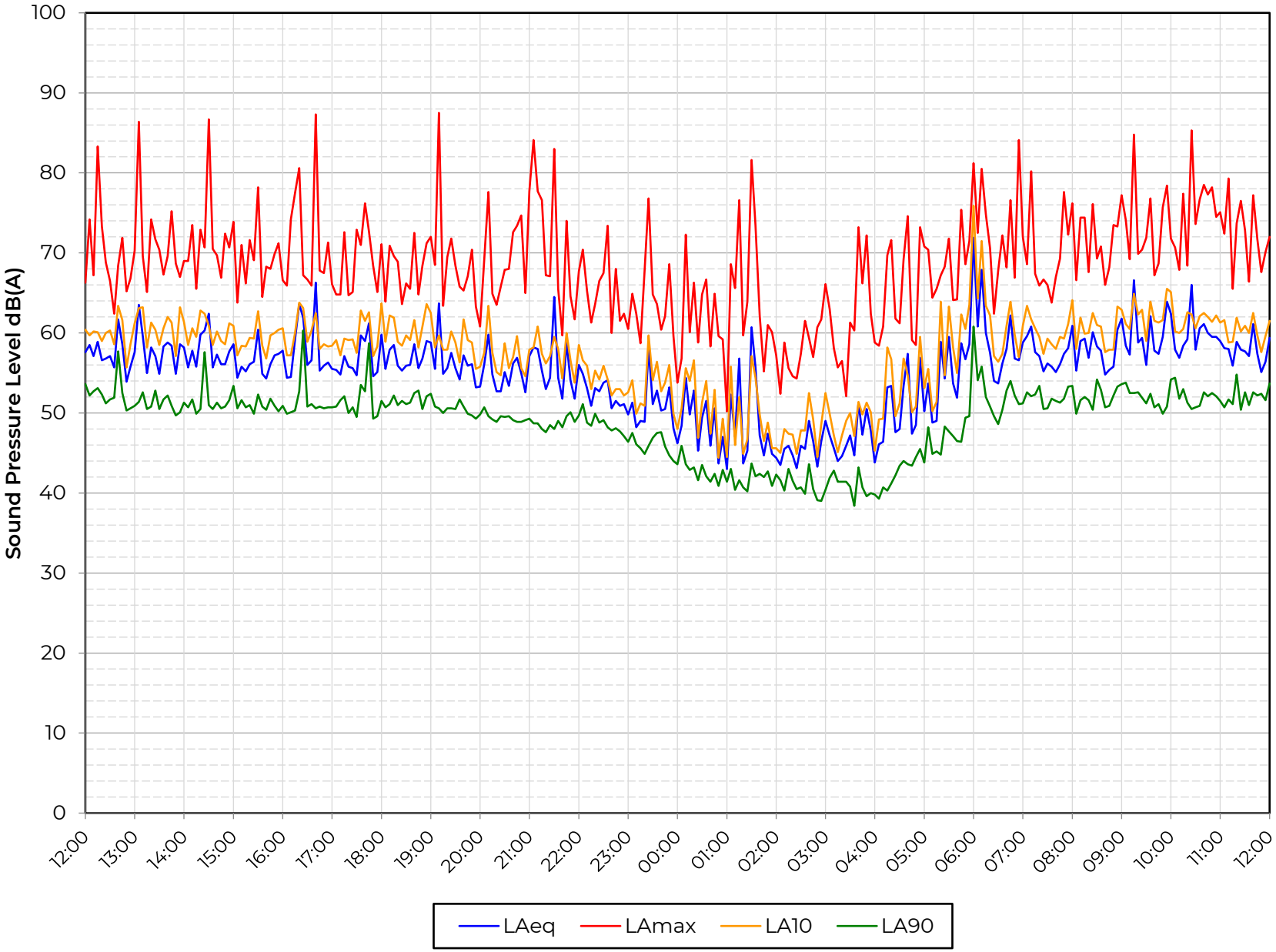
Mon 15 Jul to Tue 16 Jul

Figure AS13600/TH5

clarke saunders acoustics

Barclays House

Position LT2



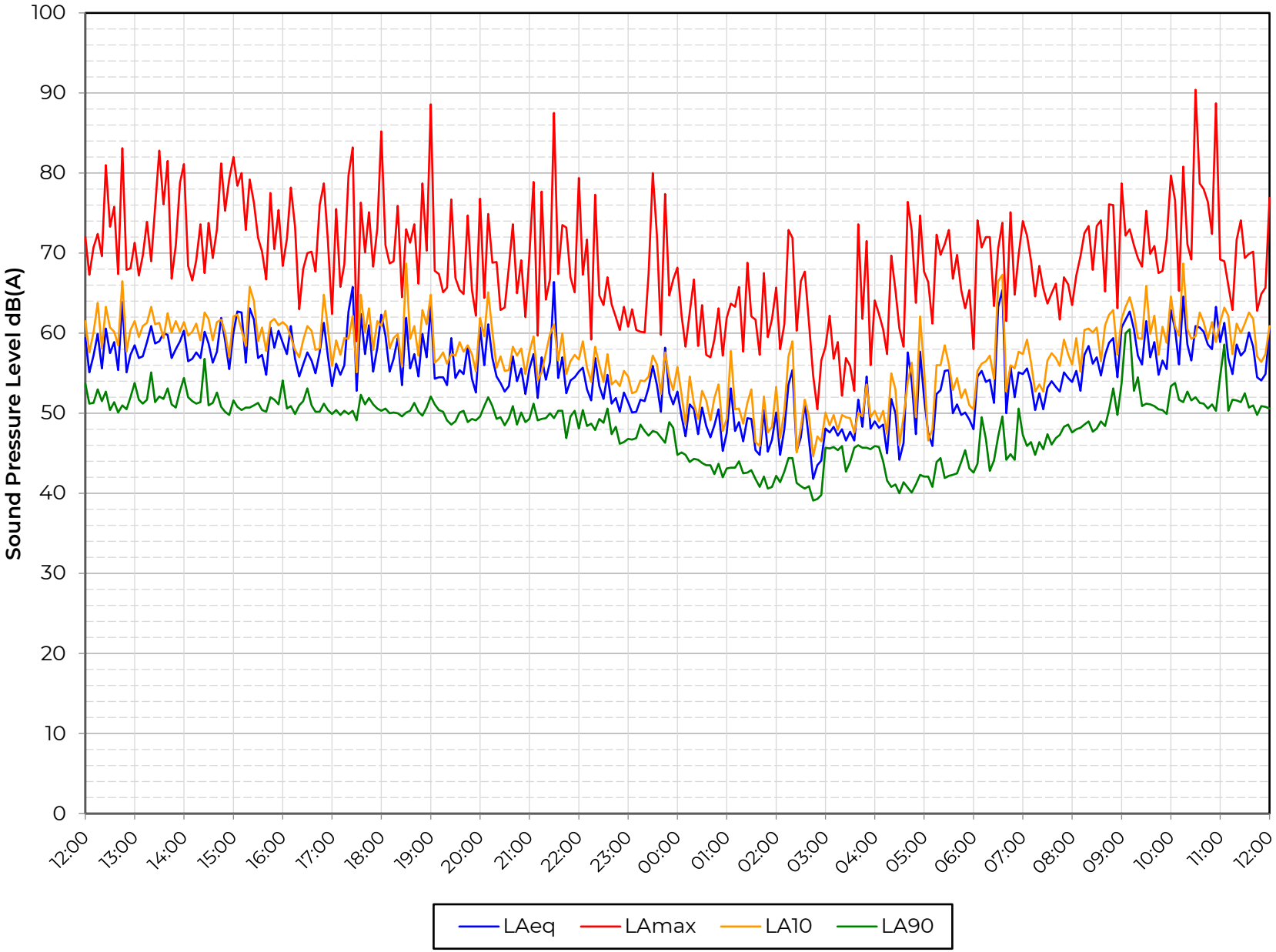
Thu 11 Jul to Fri 12 Jul

Figure AS13600/TH6

clarke saunders acoustics

Barclays House

Position LT2



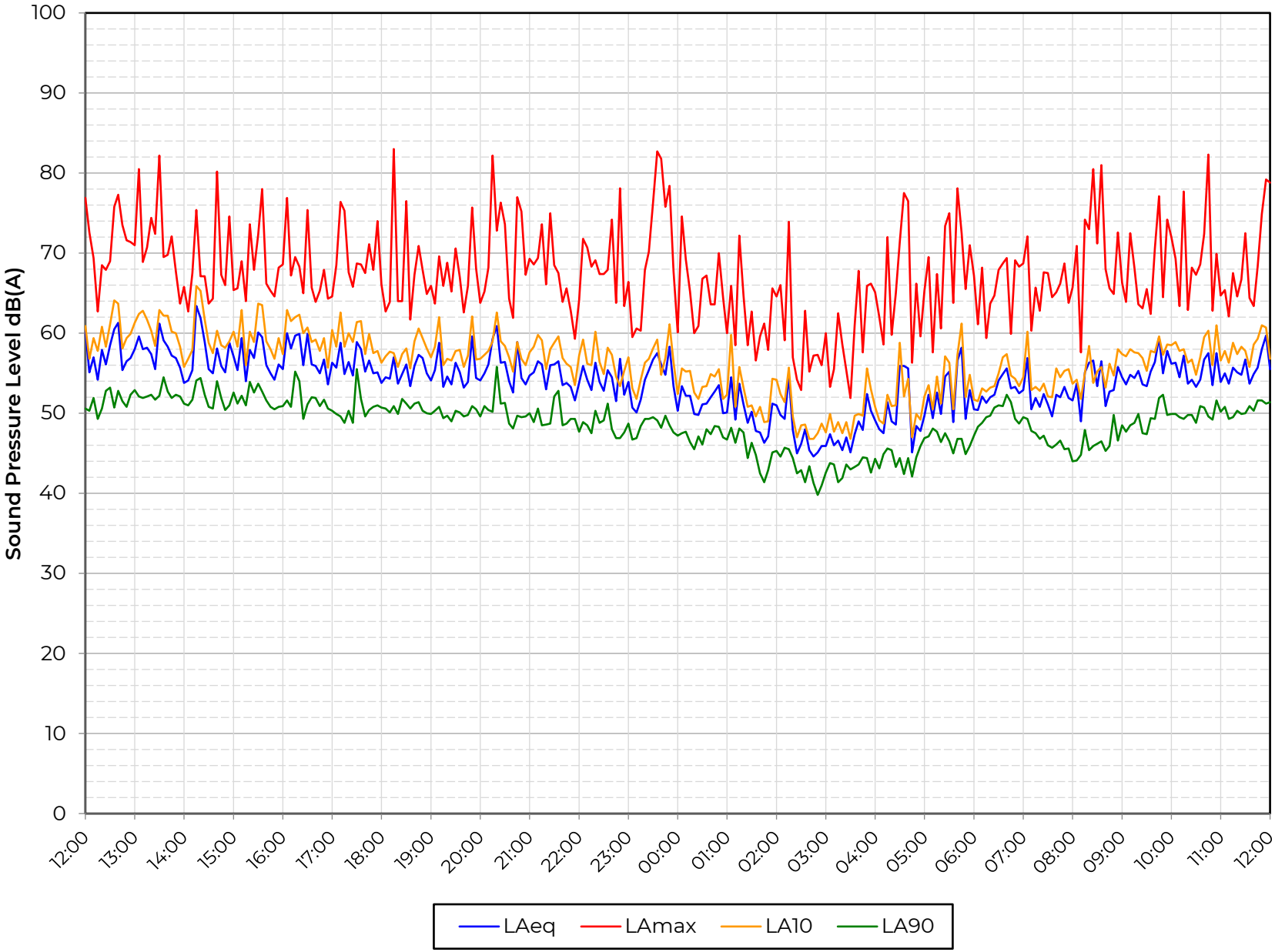
Fri 12 Jul to Sat 13 Jul

Figure AS13600/TH7

clarke saunders acoustics

Barclays House

Position LT2



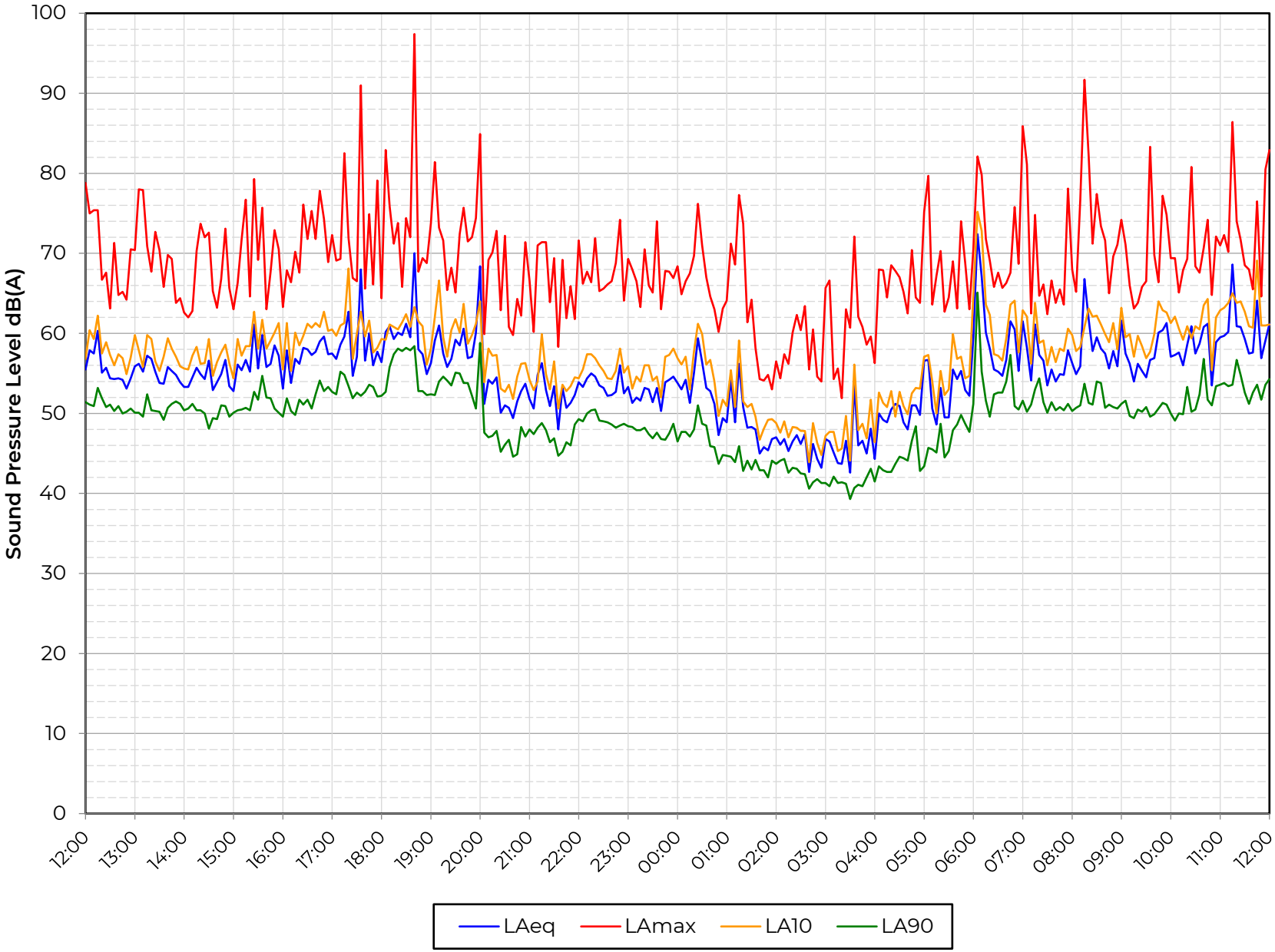
Sat 13 Jul to Sun 14 Jul

Figure AS13600/TH8

clarke saunders acoustics

Barclays House

Position LT2



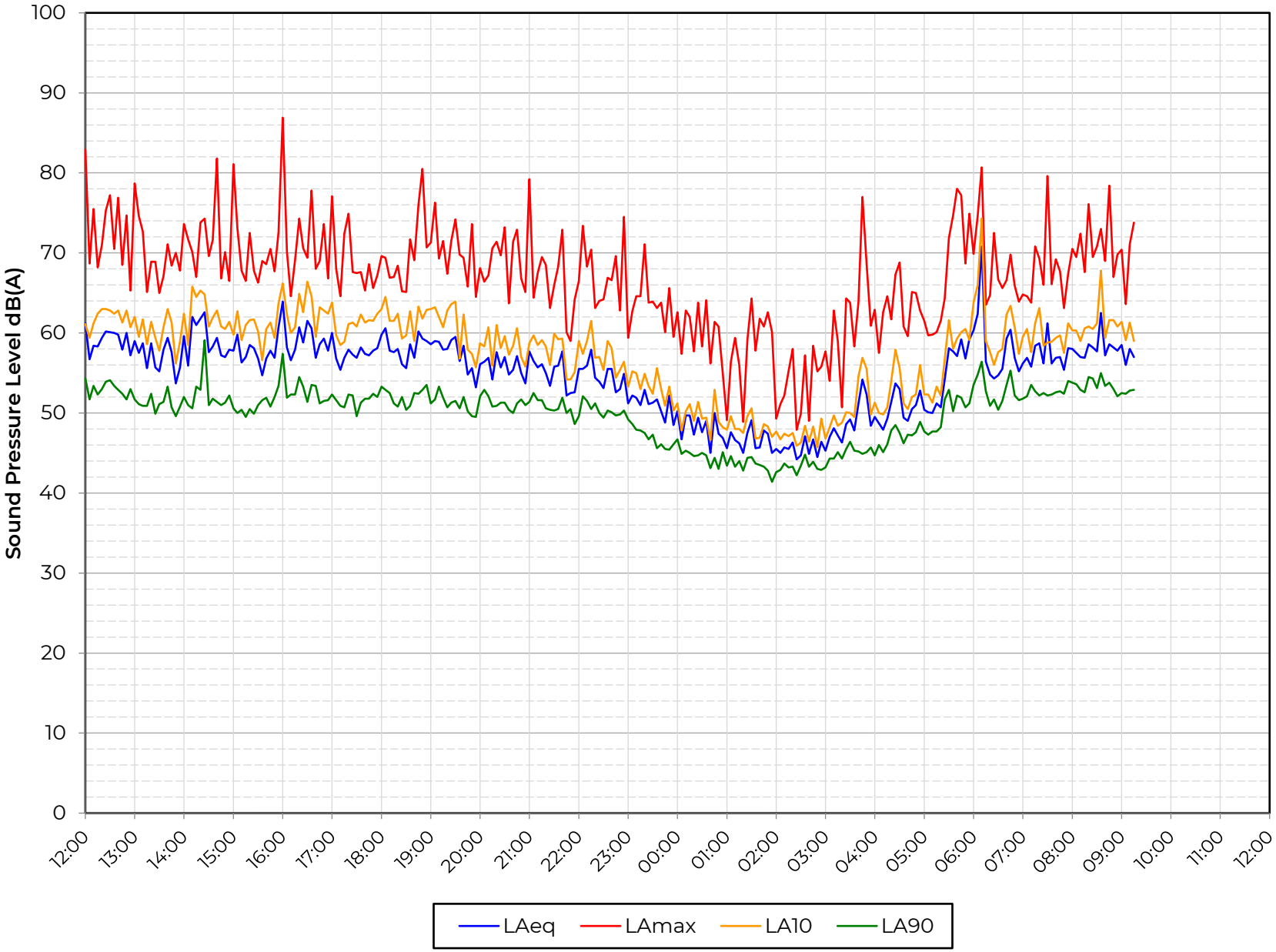
Sun 14 Jul to Mon 15 Jul

Figure AS13600/TH9

clarke saunders acoustics

Barclays House

Position LT2



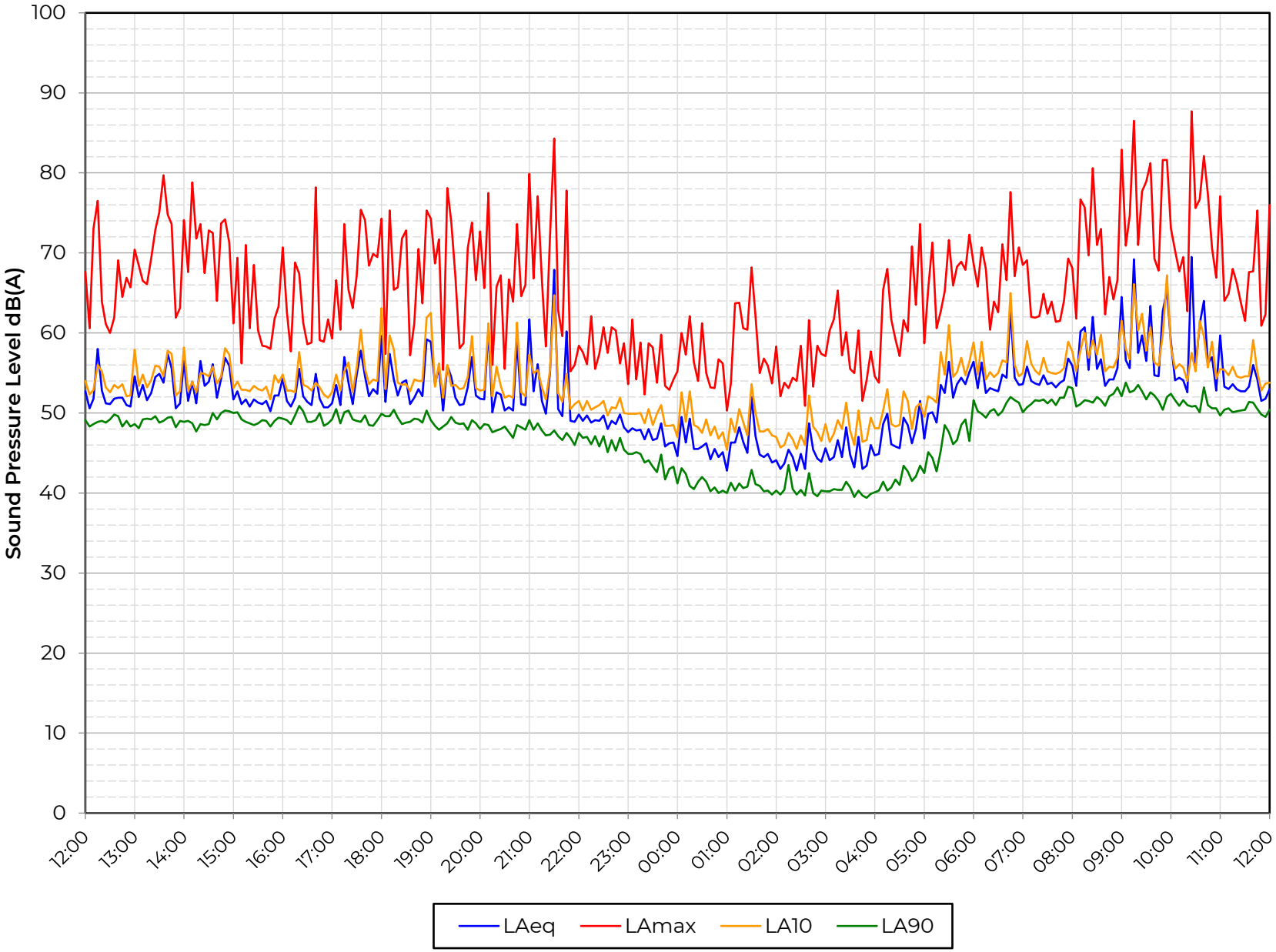
Mon 15 Jul to Tue 16 Jul

Figure AS13600/TH10

clarke saunders acoustics

Barclays House

Position LT3



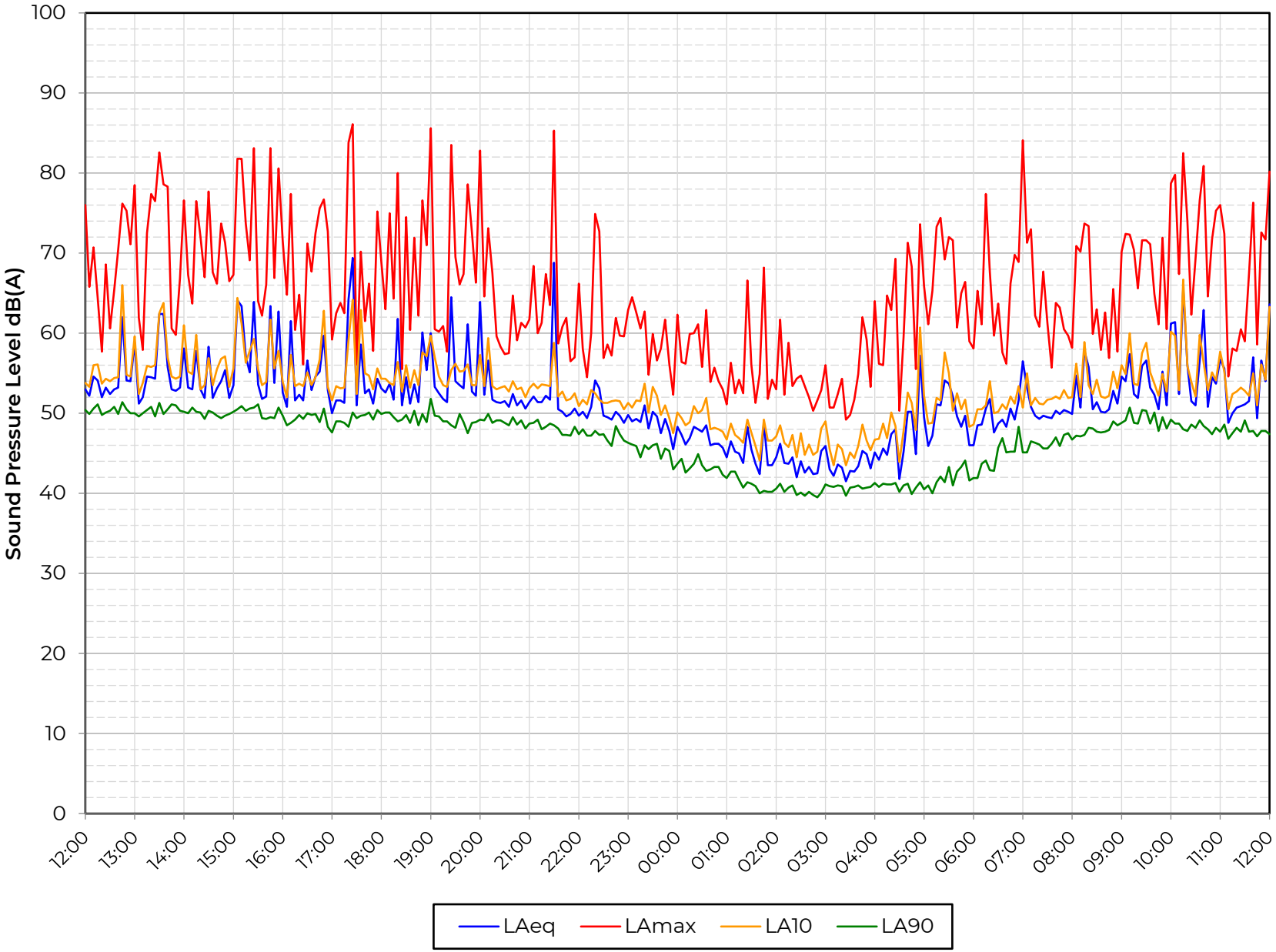
Thu 11 Jul to Fri 12 Jul

Figure AS13600/TH11

clarke saunders acoustics

Barclays House

Position LT3



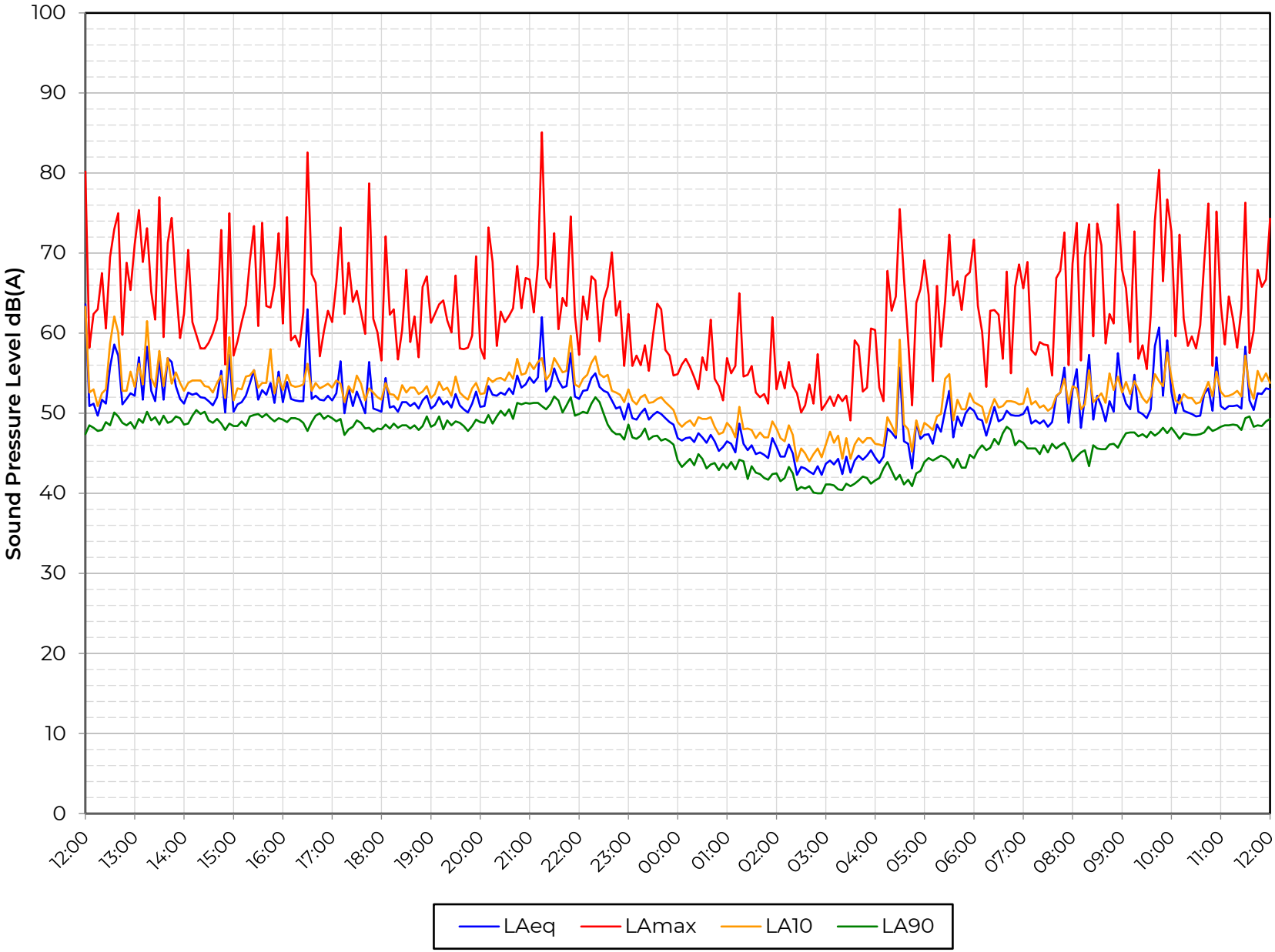
Fri 12 Jul to Sat 13 Jul

Figure AS13600/TH12

clarke saunders acoustics

Barclays House

Position LT3



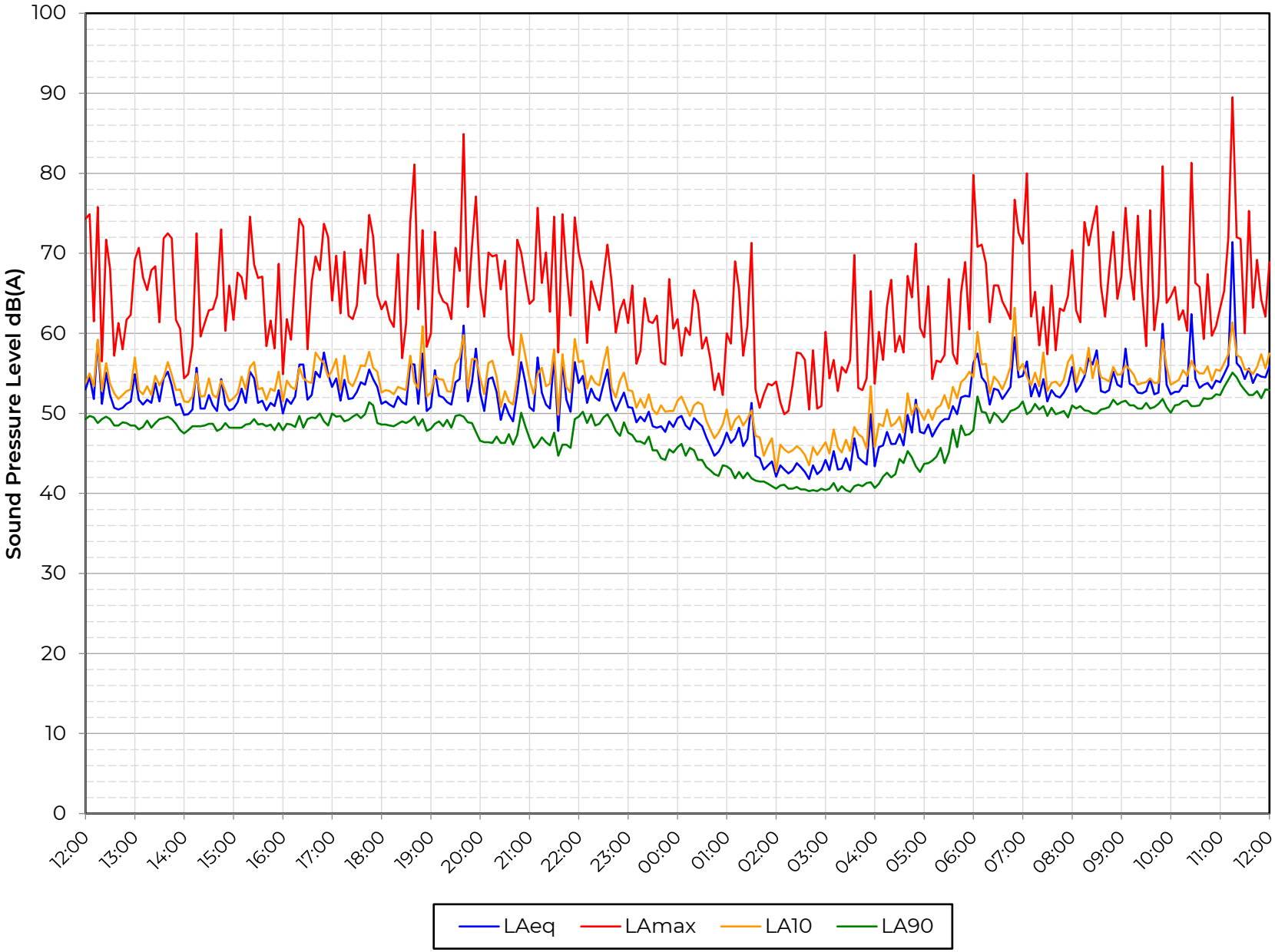
Sat 13 Jul to Sun 14 Jul

Figure AS13600/TH13

clarke saunders acoustics

Barclays House

Position LT3



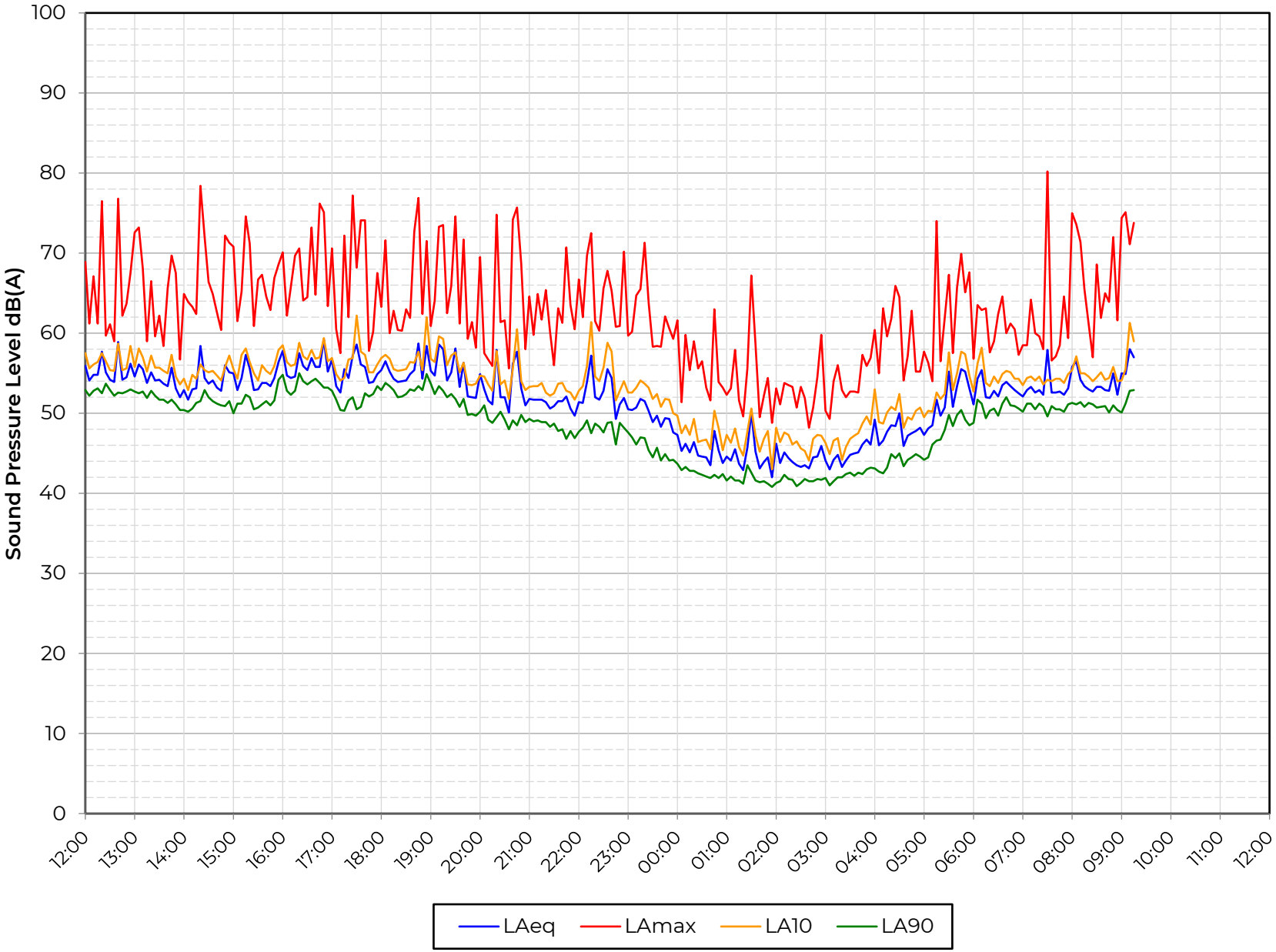
Sun 14 Jul to Mon 15 Jul

Figure AS13600/TH14

clarke saunders acoustics

Barclays House

Position LT3



Mon 15 Jul to Tue 16 Jul

Figure AS13600/TH15

APPENDIX A

Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.

Noise Sound that is unwanted by or disturbing to the perceiver.

Frequency The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.

dB(A): Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A.

L_{eq}: A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc).

The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction.

Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.

L_{10} & L_{90}: Statistical L_n indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, L_{10} is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, L_{90} is the typical minimum level and is often used to describe background noise.

It is common practice to use the L_{10} index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow.

L_{max}: The maximum sound pressure level recorded over a given period. L_{max} is sometimes used in assessing environmental noise, where occasional loud events occur which might not be adequately represented by a time-averaged L_{eq} value.

NR *Noise Rating*. A single figure noise level rating that takes into account the frequency content of an acoustic environment.

R *Sound Reduction Index*. Effectively the Level Difference of a building element when measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010 and corrected for its size and the reverberant characteristics of the receive room.

D The sound insulation performance of a construction is described in terms of the difference in sound level on either side of the construction in the presence of a sound source on one side and the reverberant characteristics of the adjoining 'receive' space. D is the arithmetic Level Difference in decibels between the

source and receive sound levels when filtered into frequency bands.

D_{nT}	*Weighted Standardised Level Difference*. As defined in BS EN ISO 717-1, representing the Weighted Level Difference, when standardised for reference receiving room reverberant characteristics.
$D_{n,e}$	Normalised sound insulation of small building elements of fixed dimensions, such as vents, measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010.
$D_{n,f}$	Flanking sound insulation of lightweight elements, such as curtain wall mullions, measured in an accredited laboratory test suite in accordance with the procedures laid down in ISO 10848-2:2006
R_w D_w $D_{nT,w}$ $D_{n,e,w}$ $D_{n,f,w}$	Value of parameter, determined as above, but weighted in accordance with the procedures laid down in BS EN ISO 717-1 to provide a single-figure value.
C, C_{tr}	Spectral adaptation terms to be added to a single number quantity such as DnT,w, to take account of the sound insulation within frequency ranges of particular interest.
$L'_{nT,w}$	*Weighted Standardised Impact Sound Pressure Level* as defined in BS EN ISO 717-2, representing the level of sound pressure when measured within a space where the floor above is under excitation from a calibrated tapping machine, standardised for the receiving room reverberant characteristics.
ΔL_w	Change in impact sound pressure level when a floor is fitted with a 'soft' or resilient covering, as measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-3:2010.

Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band.

In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000

Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a

guide to the subjective interpretation of changes in environmental sound level can be given.

INTERPRETATION

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

Earth Bunds and Barriers - Effective Screen Height

When considering the reduction in sound level of a source provided by a barrier, it is necessary to establish the "effective screen height". For example if a tall barrier exists between a sound source and a listener, with the barrier close to the listener, the listener will perceive the sound as being louder if he climbs up a ladder (and is closer to the top of the barrier) than if he were standing at ground level. Equally if he sat on the ground the sound would seem quieter than if he were standing. This is explained by the fact that the "effective screen height" is changing with the three cases above. In general, the greater the effective screen height, the greater the perceived reduction in sound level.

Similarly, the attenuation provided by a barrier will be greater where it is aligned close to either the source or the listener than where the barrier is midway between the two.