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NOISE IMPACT ASSESSMENT FOR PROPOSED DEVELOPMENT:

54-56 King Street, South Shields NE33 1HZ

Prepared for:

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Test Report Number: AS23-10

1.00 INTRODUCTION

1.1

Acoustic Solutions has been commissioned by Jamail Assets Limited to undertake a noise impact assessment for a proposed development at 54-56 King Street, South Shields.

1.2

The objectives for the noise impact assessment were as follows:

- Establish the daytime, evening and night time background sound levels at the application site and its surrounding environs;
- Establish the likely daytime, evening and night time noise impact arising from the noise sources identified in the course of the assessment;
- If appropriate, provide recommendations with respect to management and/or structural controls to mitigate and control the potential noise impact upon future occupiers of the proposed development.

1.3

This report details the methodology and results of the assessment. It has been prepared to accompany an application for planning permission that has been submitted to South Tyneside Council for the proposed development of the application site.

1.4

This report has been prepared for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult Jamail Assets Limited and Acoustic Solutions as to the extent to which the findings may be appropriate for their use.

1.5

A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.

2.0 NOISE IMPACT ASSESSMENT CRITERIA

2.1

In terms of noise impact assessment criteria, Paragraph 170e of the National Planning Policy Framework (NPPF) 2018 states that planning policies and decisions should contribute to and enhance the natural 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 soil, air, water or noise pollution or land instability.'*

2.2

Planning Practice Guidance specifically dealing with noise was uploaded to the Government's Planning Portal in March 2014 as an accompaniment to the National Planning Policy Framework. This guidance is summarised herein.

2.3

The guidance states that noise needs to be considered when new developments may create additional noise. Whilst noise can override other planning concerns, neither the Noise Policy Statement for England nor the National Planning Policy Framework (which reflects the Noise Policy Statement for England) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of proposed development.

2.4

In order to determine noise impact, local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:

- Whether or not a significant adverse effect is occurring or likely to occur;
- Whether or not an adverse effect is occurring or likely to occur, and;
- Whether or not a good standard of amenity can be achieved.

2.5

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

2.6

In terms of Observed Effect Levels:

- No Observed Adverse Effect Level (NOAEL) – This is the level of noise exposure below which no effect at all on health or quality of life can be detected;

- Lowest Observed Adverse Effect Level (LOAEL) – This is the level of noise exposure above which adverse effects on health and quality of life can be detected, and;

- Significant Observed Adverse Effect Level (SOAEL) – This is the level of noise exposure above which significant adverse effects on health and quality of life occur.

2.7

At the lowest extreme, when noise is not noticeable, there is by definition no effect. As the noise exposure increases, it will cross the 'no observed' effect level as it becomes noticeable. However, the noise has no adverse effect so long as the exposure is such that it does not cause any change in behaviour or attitude. The noise can slightly affect the acoustic character of an area but not to the extent there is a perceived change in quality of life. If the noise exposure is at this level no specific measures are required to manage the acoustic environment.

2.8

As the exposure increases further, it crosses the lowest observed adverse effect level boundary above which the noise starts to cause small changes in behaviour and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard. The noise therefore starts to have an adverse effect and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise).

2.9

Increasing noise exposure will at some point cause the significant observed adverse effect level boundary to be crossed. Above this level the noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is above this level the planning process should be used to avoid this effect occurring, by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused.

2.10

At the highest extreme, noise exposure would cause extensive and sustained changes in behaviour without an ability to mitigate the effect of noise. The impacts on health and quality of life are such that regardless of the benefits of the activity causing the noise, this situation should be prevented from occurring.

2.11

Table 2.1 summarises noise exposure hierarchy, based on likely average response.

Table 2.1 LOAEL and SOAEL Values

Noise Source	Assessment Location	LOAEL	SOAEL	Time
	Outdoor living space	55 dB $L_{Aeq, 1\ hour}$ (A)	56-60 dB $L_{Aeq, 1\ hour}$ (A)	Day (07:00-23:00)
	Façade	50 dB $L_{Aeq, 1\ hour}$ (A)	72 dB $L_{Aeq, 16\ hour}$ (A)	Day (07:00-23:00)
General environmental noise: Road/Rail	Façade	45 dB $L_{Aeq, 8\ hour}$ (B)	67 dB $L_{Aeq, 8\ hour}$ (A)	Night (23:00-07:00)
	Habitable Room	30 dB $L_{Aeq, 8\ hour}$ (B)	40 dB $L_{Aeq, 8\ hour}$ (A)	Night (23:00-07:00)
	Habitable Room	35 dB $L_{Aeq, 16\ hour}$ (A)	45 dB $L_{Aeq, 16\ hour}$ (A)	Day (07:00-23:00)

A: World Health Organisation: Guideline for Community Noise (1999)

B: World Health Organisation: Noise Guidance for Europe (2009)

2.12

The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. These factors include:

- The source and absolute level of the noise together with the time of day it occurs;

- For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise;

- The spectral content of the noise (i.e. whether or not the noise contains particular high or low frequency content) and the general character of the noise (i.e. whether or not the noise contains particular tonal characteristics or other particular features);

- The local acoustic character of the area.

2.13

In addition, further useful contextual guidance is provided in:

- British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233);

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

2.14

British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' sets indoor ambient noise levels from residential dwellings (see table below).

Table 2.2 – Indoor Ambient Noise Levels in Dwellings (BS 8233): 2014

Activity	Location	07:00-23:00 hours	23:00-07:00 hours
Resting	Living room	35 dB, L_{Aeq}	N/A
Dining	Dining room	40 dB, L_{Aeq}	N/A
Sleeping	Bedroom	35 dB, L_{Aeq}	30 dB, L_{Aeq}

2.15

With regard to sound attenuation through the building envelope, the 'weak points' in the building façade are generally considered to be the windows. The worked example (G.1) at Annex G of BS 8233 suggests that a partially opened window would provide sound attenuation of approximately 15 dB Rw. The Standard also suggests that *"..standard insulating glass units have an insulation value of approximately 30 dB Rw"* when closed.

2.16

With respect to noise affecting external areas, i.e. gardens, BS 8233 states that *".. it is desirable that the steady noise level does not exceed 50 dB LAeq, and 55 dB LAeq should be regarded as the upper limit".*

2.17

The World Health Organisation's Guidelines for Community Noise (1999) sets indoor ambient noise levels from residential dwellings (see table below).

Table 2.3 – Indoor Ambient Noise Levels in Dwellings (WHO 1999)

Environment	Critical Health Effect(s)	L_{Aeq} dB	L_{Amax} dB
Outdoor Living Area	Serious annoyance, daytime and evening	55	N/A
	Moderate annoyance, daytime and evening	50	N/A
Dwelling, indoors	Moderate annoyance, daytime and evening	35	N/A
Inside bedrooms	Speech intelligibility and moderate annoyance daytime and evening	30	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	60

3.0 BASELINE NOISE SURVEY

3.1 Site Setting

The application site is 54-56 King Street, South Shields (Appendix 2). The planning application is for the formation of a three-storey (first, second and third) residential dwelling at the premises above a commercial premises located on the ground floor. The (Planning Application reference: ST/1013/22/PNCU: Change of use from Commercial, Business and Service (Use Class E) to Dwellinghouses (Use Class C3). Former vacant office space (Egi Use) on first, second and third floors to form 3 no. (C3 Use) residential apartment units and shopfront alterations).

South Tyneside Council has granted planning permission, subject to a number of conditions. Condition 3 states:

"The residential apartments hereby approved shall not be occupied until a noise assessment has been submitted to, and approved in writing by, the Local Planning Authority, and any recommendations arising from the approved noise assessment are implemented in full and retained thereafter in perpetuity."

The condition is informed by the comments submitted by Environmental Health:

"Following our discussion and further consideration of the matter, I am satisfied that with appropriate mitigation in the form of enhanced glazing and ventilation future occupiers of these residential units will not be unreasonably impacted by external noise levels from surrounding commercial uses.

"I do believe that a noise assessment is necessary to ensure the appropriate levels of glazing and ventilation are installed. This will allow monitoring of external noise levels from commercial uses to be taken into account when choosing the specification for the enhanced mitigation. I am satisfied for this to be secured by way of condition.

"I have discussed this application with building control who will require accordance with the appropriate building standards which will ensure insulation between the adjoining commercial properties is sufficient to ensure residential amenity is also protected against nearby uses.

"I remain concerned regarding the general hubbub of a busy town centre, noise from comings and goings related to South Shields night time economy, especially at weekends, music from street performers and the significant regeneration that is taking place on King Street and its surrounds. These sources may all impact on the reasonable enjoyment of residential amenity of future occupiers of the proposed site however I

acknowledge that these are not concerns that can be taken into consideration for this planning application."

3.2 Site Description

54-56 King Street is located in South Shields town centre. The premises is part of a row of four-storey terraced buildings that run along the northern edge of King Street. King Street is a pedestrianised shopping precinct. As such the character of the neighbourhood is predominantly commercial / retail in character.

The building's front and rear glazing was observed to consist of single-glazing throughout. The glazing was observed to be in good overall condition, with glazing seen to be 6.5 (approx.) thick. Typically, this thickness of glazing would provide 30 dB sound insulation, R_w+C_{tr}.

At the building's rear, north-facing façade is Queen Street which runs east-west, parallel to King Street. A small number of commercial premises are situated on Queen Street, notably the Café Ross, which is referred to in Environmental Health's comments; as a potential source of noise (the kitchen extraction unit) likely to affect future occupiers of number 54-56.

3.3 Noise Sources

Table 3.1 summarises the identified noise sources that have the potential to adversely impact future occupiers of the building.

Table 3.1 Noise Sources

Source	Distance at its closest point, metres				Notes
	North	South	East	West	
50 King Street	N/A	N/A	20	N/A	Ground floor Amusement Aracade - Amplified Music
King Street (general)	N/A	10	N/A	N/A	Pedestrians - Talking, Shouting etc.
King Street / Station Approach	N/A	N/A	88	N/A	Amplified Buskers - Amplified Music
King Street	N/A	N/A	200	N/A	Bars and Night Clubs: Ship & Royal Public House; The Assembly; Rosie's II; Kirkpatrick's; Club del Mar; The Lounge Public House - Amplified Music, patrons talking / shouting
Café Ross, 5 Queen Street	30	N/A	N/A	N/A	Kitchen Extraction Fan
Queen Street	10	N/A	N/A	N/A	Delivery noise, delivery vehicles
Miscellaneous	N/A	N/A	N/A	N/A	Seagulls

3.4

In order to establish the daytime, evening and night time background noise levels at the application site and its surrounding environs, a baseline noise survey was undertaken on 18 & 19 February 2023, between 07:00 and 23:00 hours (daytime/evening) and 23:00-07:00 hours (night time).

3.5

For the purpose of the assessment, two noise monitoring positions, MP1 and MP2 were adopted in free field environments at over 1.5 metres above ground and over 3 metres from any vertical reflective surface (see Appendix 2):

- MP1. King Street. The microphone was located outside the building's southern façade. The noise environment at MP1 is sufficient to describe noise from all sources on Kings Street, as described in Table 3.1.

- MP2. Queen Street. The microphone was positioned outside the building's northern façade. The noise environment at MP2 is sufficient to describe noise from all sources on Queens Street, as described in Table 3.1.

3.6

At all microphone positions a series of hourly 15-minute noise measurements were undertaken using a Type 1 integrating sound level meter (Appendix 4). The measurement system calibration was verified immediately before the commencement of the measurement sessions and again at the end. Weather conditions throughout the survey were mostly dry and overcast. Wind speeds were commensurate for the assessment methodology. Measurements consisted of A–weighted parameters: L_{Aeq}, L_{A90} and L_{Amax}.

3.7 MP1.

The principle existing noise source in the vicinity of MP1 changed throughout the day. Between 0700 and 0800 hours the principle noise source was seagulls calling as they flew over the area. Of all the noise sources witnessed, the seagulls were the loudest noise source.

Between 0800 and 0900 hours retail units' metal roll shutters opening became the principle noise source as retailers in the vicinity opened up. As the morning progressed, noise from pedestrians passing the premises became the main noise source. From the early afternoon (1500 to 1630 hours, noise from an amplified busker located on the junction of King Street and Station Approach was dominant.

As night began to fall at 1700 hours, the seagulls returned. Between 1800 and 2000 hours, after retail shutters were closed, there was a general lull in noise, save for noise from individuals or small groups of people walking along King Street. From 2000 hours until 0300 hours, the noise on King Street was dominated by small groups of patrons making their way to and from a number of pubs and night clubs situated some 200 metres east from 54-56 King Street. Some amplified music was audible from these premises, but this was not significant. Between 0400 and 0700 hours there was a further lull in noise levels.

Table 3.2 summarises daytime, evening and night time noise measurement data. For the purposes of this report, the average L_{Aeq} and L_{Amax} values measured will be used so to provide an accurate illustration of the noise environment.

Table 3.2 – MP1: Baseline Noise Measurement Data, Daytime, Evening and Night Time Noise Measurements

Measurement Time	Residual Noise Level, dB, $L_{Aeq, 15\ min}$	Background Noise Level, dB $L_{A90, 15\ min}$	Measured Noise Level, dB $L_{AMax, 15\ min}$
07:00	62.9	48.2	83.1
08:00	57.1	48.3	76.5
09:00	49.4	47.1	64.2
10:00	50	46.1	75.7
11:00	48.8	45.2	73.4
12:00	49.6	45.2	61
13:00	48.9	46.5	63.2
14:00	51.1	45	76.1
15:00	49.3	45.2	66.8
16:00	61.2	45.1	65.8
17:00	63.3	45.6	84.9
18:00	49	45.1	65.2
Average/Max	**53**	**46**	**85**
19:00	49.1	45	62.9
20:00	51.5	44.5	67.9
21:00	55	44.5	65
22:00	55.2	45.3	61
Average/Max	**53**	**45**	**68**
23:00	51.6	47.5	53
00:00	52	45	53.3
01:00	54.2	43.3	57
02:00	52.8	44.4	53.5
03:00	45.2	43.8	54
04:00	44.2	42.1	59.1
05:00	43.1	40	54.1
06:00	49.7	41.2	N/A
Average/Max	**49**	**43**	**59**

3.8 MP2.

The principle existing noise source in the vicinity of MP2 was intermittent road traffic. At 0900 hours, and again at 1700 hours, noise from the small number of small businesses on Queen Street opening up and closing was dominant. A number of deliveries to these businesses were observed, but the noise from these was more from vehicles arriving and departing than from the actual delivery process.

Between 0700 and 0800, and again at 0700 to 1800 hours, the area was dominated by noise from seagulls. Of all the noise sources witnessed, the seagulls were the loudest noise source.

From 1800 hours only, there was a general lull in noise levels, save for occasional vehicles and patrons walking to and from King Street. By 0300, there was no noise to speak of. Noise from the kitchen extraction system serving Café Ross was completely inaudible.

Table 3.3 summarises daytime, evening and night time noise measurement data. For the purposes of this report, the average L_{Aeq} and L_{Amax} values measured will be used so to provide an accurate illustration of the noise environment.

Table 3.3 – MP2: Baseline Noise Measurement Data, Daytime, Evening and Night Time Noise Measurements

Measurement Time	Residual Noise Level, dB, $L_{Aeq, 15\ min}$	Background Noise Level, dB $L_{A90, 15\ min}$	Measured Noise Level, dB $L_{AMax, 15\ min}$
07:00	64.9	45.1	85
08:00	49.9	45.6	56.3
09:00	47.6	46.8	58.8
10:00	47	46.7	59
11:00	46.6	45.7	77.8
12:00	45.8	46	58
13:00	51.4	46.6	58.8
14:00	46.6	47	57.1
15:00	46.4	46.4	80
16:00	47	44.6	57.9
17:00	63	45.8	60
18:00	52.6	43.2	57.1
Average/Max	51	46	85
19:00	48	47.3	56.4
20:00	43.8	48	55.3
21:00	45	48	54.6
22:00	46.1	48.6	61
Average/Max	**46**	**48**	**61**
23:00	48.6	45	53
00:00	46.2	43.5	53.3
01:00	45.8	43.1	57
02:00	45	42.3	52.8
03:00	45	42.3	50
04:00	44.9	41.5	54.4
05:00	44.4	41.5	53.9
06:00	43.5	40.4	55
Average/Max	**45**	**42**	**57**

4.0 DISCUSSION

4.1 External Noise Levels

4.1.1 Noise Policy Statement for England

Table 4.1 summaries the Observed Effect Levels for predicted daytime, evening and night time external SPL at MP1 and MP2.

Table 4.1: Predicted External Evening and Night Time Observed Effect Levels arising from Noise from external noise as predicted at MP1 and MP2.

Location	Predicted Daytime Observed Effect Level	Predicted Evening Observed Effect Level	Predicted Night Time Observed Effect Level
Southern, front, Façade	LOAEL	SOAEL	NOAEL
Northern, rear, Façade	LOAEL	NOAEL	LOAEL

4.2 Internal Noise Levels

4.2.1 World Health Organisation: 1999 and BS8233: 2014 (Internal)

Assuming a -15 dB attenuation provided by a slightly open window, daytime, evening and night time internal sound pressure levels arising from daytime, evening and night time noise sources can be predicted within west, south and east-facing rooms.

These values can then be compared against maximum noise criteria, as set out in the World Health Organisation's 'Guidelines for Community Noise (1999) and BS8233: 2014. Tables 4.2 and 4.3 summarise the predicted internal noise levels.

Table 4.2: Southern, front, Façade-facing room, Predicted Internal Sound Pressure Levels at 54-56 King Street

Time	Location	External SPL, dB	Open Window Attenuation, dB	Predicted Internal SPL, dB	WHO & BS8233 35 dB Criteria met?
Daytime/Evening	Southern, front, Facade	53	15	38	No
Night	Southern, front, Facade	49	15	34	No

Table 4.3: Northern, rear, Façade-facing room, Predicted Internal Sound Pressure Levels at 54-56 King Street

Time	Location	External SPL, dB	Open Window Attenuation, dB	Predicted Internal SPL, dB	WHO & BS8233 35 dB Criteria met?
Daytime/Evening	Northern, rear, Façade	49	15	34	Yes
Night	Northern, rear, Façade	45	15	30	Yes

5.0 RECOMMENDATIONS

5.1 Internal

5.1.1 South-Facing Glazing

The predicted internal sound levels suggest that Noise Policy Indicators, BS8233 and WHO criterion have all been exceeded. WHO and BS8233 internal values are exceed by 3 dB (daytime) and 4 dB (night time) with open window ventilation.

BS8233: 2014 states that where development is considered necessary or desirable, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. Consequently, it is recommended that provided internal ambient noise levels with windows partially open (in relation to the overheating condition) do not exceed the levels shown in Table 5.1, a reasonable balance between elevated noise levels and reduction in overheating risk is provided.

Table 5.1: +5 dB Relaxation of BS8233: 2014 daytime and night time criteria

Time	Relaxed BS8233 +5 dB Criteria
Daytime/ Evening	40
Night	35
Night, L_{AMax}	50

All habitable south-facing rooms should have glazing of 6.4mm laminated glass, 12mm air-filled cavity, 8.8mm toughened glass. Optional acoustic vents. The Pilkington datasheet (Pilkington, 2022, see Appendix 4) cites an insulation value of 32 dB, R_w (window closed) for this approximate specification. An alternative to this would be the installation of suitable secondary glazing, with glazing of no less thickness than 6.8mm. It is predicted that a suitably installed secondary glazing system would result in an overall sound insulation ($R_w + C_{tr}$) of 35 dB,

Should the BS8233 allowance be applied, open-window ventilation is acceptable. If not, acoustic trickle ventilation is acceptable. Typically, an acoustic trickle vent, incorporating an enclosed flap (or buffer) provides noise reduction of 40 dB (closed) and 33 dB (open) (See Appendix 4).

5.1.2 North-Facing Glazing

The predicted internal sound levels suggest that Noise Policy Indicators, BS8233 and WHO criterion have all been met. WHO and BS8233 internal values are exceed by 3 dB (daytime) and 4 dB (night time) with open window ventilation.

All north-facing rooms should have glazing of 6.4mm laminated glass, 12mm air-filled cavity, 8.8mm toughened glass. Optional acoustic vents. The Pilkington datasheet (Pilkington, 2022, see Appendix 4) cites an insulation value of 32 dB, R_w (window closed) for this approximate specification. An alternative to this would be the installation of suitable secondary glazing, with glazing of no less thickness than 6.8mm. It is predicted that a suitably installed secondary glazing system would result in an overall sound insulation ($R_w + C_{tr}$) of 35 dB. Open-window ventilation is acceptable.

5.2 External

There is no external amenity associated with the premises.

Appendix 1
Glossary of Acoustic Terms

Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 µPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$L_p = 20 \log_{10}(p/p_0)$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p0 = reference sound pressure (20 µPa).

A-weighting Network

A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$

The A-weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified period of time. In other words, L_{Aeq} is the level if a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period. L_{Aeq} is increasing being used as the preferred parameter for all forms of environmental noise.

$L_{A90,T}$

The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

$L_{A\ max}$

The maximum A-weighted noise level recorded during the measurement period.

Hz

The unit of frequency. The number of cycles (in the context of acoustics, the number of complete sound waves generated) per second.

Appendix 2

Location Plan and Noise Monitoring Positions

MP1: Southern Façade, King Street
MP2: Northern Façade, Queen Street

Appendix 3

Equipment Used

Noise measurements were undertaken using a precision grade sound level meter:

Norsonic Nor145 Model integrating sound level meter.
Serial Number 14529307
Certificate Number U35939/U35940
Last Laboratory Calibrated 17/10/22

B & K 4230 Model calibrator
Serial Number 724157
Last Laboratory Calibrated 21/2/22

The Sound Level Meter was calibrated before and after both measurement periods, with no significant change in calibration. All calibrations took place at the measurement position.

The SLM met the requirements of BS EN 60651: 1994 and BS EN 60804: 2001 IEC 60804: 2000. It was capable of simultaneously measuring Leq and Ln values. Batteries for the SLM and calibrator were checked prior to all measurements.

Appendix 4
References

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