

The Stage Project, Alton Towers Resort, Alton, Staffordshire.

Sound Assessment Report

Merlin Entertainments Operations Limited,
Alton Towers Resort

April 2021

Notice

This document and its contents have been prepared and are intended solely for Merlin Entertainments Operations Limited, with information in relation to the proposed Stage project at Alton Towers Resort. Cahill Design Consultants Limited assumes no responsibility to any other party in respect of, or arising out of, or in connection with this document and/or its contents.

This document has 16 pages including the cover.

Document history

Document Ref No: P1484/April21					
Revision	Purpose description	Originated	Checked	Authorised	Date
1.0	ISSUE	NA	BC	BC	20th April 2021
1.1	ISSUE	NA	BC	BC	30 th April 2021
1.2	ISSUE with Updates	NA	BC	BC	12 th May 2021

Table of contents

Chapter	Pages
Executive Summary	4
1. Introduction & Overview	5
2. Policy & Guidance Documents	7
3. Assessment Methodology	8
4. Consultation	9
5. Proposed Criteria	9
6. Baseline Data Collection	10
7. Operational Noise Assessment	12
8. Mitigation	15
9. Residual Effects	16
10. Conclusions	16

Tables

Table 1: Maximum Music Noise Levels (MNL) in accordance with Code of Practice	9
Table 2: Proposed criteria for operational sound from The Stage Project (CPENC)	10
Table 3: Averaged measured noise levels	11
Table 4: Predicted operational noise levels at receivers, from Lawns.	13
Table 5: Averaged measured noise levels	13
Table 6: Predicted operational noise levels at receivers, from Fountain Square	15

Figures

Figure 1: The proposed Stage location within Alton Towers Resort	6
Figure 2: Noise sensitive receivers' locations	7
Figure 3: Measurement Positions	11
Figure 4: The Stage project location over winter period	14

Executive Summary

This report outlines the assessment and findings relating to a noise assessment for the proposed Stage project, located within Alton Towers Resort (ATR). It is proposed that an application for full planning permission will be submitted for the installation of a seasonal temporary stage over a 5 year period at Alton Towers Resort. The Stage is proposed to be installed on the Front Lawn for the summer season and relocated to the Fountain Square, to the south east of the Hex ride entrance, for the winter season.

A series of sound surveys have been undertaken at the nearest noise sensitive receivers around the perimeter of Alton Towers Resort, to establish representative ambient noise levels. Source measurements were also undertaken close to the PA system proposed to be used for the Stage. These measurements form the basis of the assessment undertaken.

An assessment has been undertaken in relation to potential noise impact to defined external receivers. This relates to the amplified Shows that will take place throughout winter and summer periods, at both proposed locations. This report outlines the requirements for maximum noise levels from the Stage, to achieve the prescribed requirements.

The assessment undertaken in this report demonstrates that the prescribed criteria can be achieved at all locations, based upon worst case (highest) Show noise levels.

Section 1 of this report provides an overview of the proposed development. Section 2 outlines relevant policy and planning guidance. Section 3 outlines relevant calculation methodology, while section 4 outlines consultation undertaken with the Local Authority. Section 5 describes the proposed criteria for the project. Section 6 outlines the details of baseline data for the surrounding area. Section 7 outlines the assessment for the operation of the stage project. Section 8 and 9 discusses any residual effects and cumulative effects, respectively. Section 10 outlines the report conclusions.

1. Introduction & Overview

1.1. Cahill Design Consultants has been commissioned by Merlin Entertainments, Alton Towers Resort, to assess the impact from sound relating to the proposed Stage project, to the nearest Noise Sensitive Receptors (NSRs), around the perimeter of Alton Towers.

1.2. This assessment considers the potential sound impacts from the proposed project to off park receivers, from operational activities.

1.3. The project will comprise the erection of a small Stage area, located on the Lawn area of Alton Towers during the summer season, relocating to Fountain Square for the winter season.

1.4. The Stage will host a number of shows with amplified speech and audio throughout the summer period and winter season periods from March until February. During school holidays, the Stage will operate weekday and weekend periods. During non-school holiday periods, the Stage will operate weekends only. The Stage is expected to operate for a maximum of 262 days per year, however, it is likely that the actual number of operational days will be substantially less than this, due to weather and other constraints.

1.5. The Stage is proposed to host 6 to 10 shows per day with quiet break periods in between shows.

1.6. Operational timings for the Stage will be consistent with opening times for the wider Alton Towers Resort. Shows will not start before 10am. Final show times will vary but no shows will be played later than 10pm.

1.7. For the winter period, November until February, the Stage will relocate to Fountain Square, close the Towers. The same timing schedule will be followed.

1.8. The Stage will be an annual feature at Alton Towers Resort and is currently proposed to operate for at least 5 years.

1.9. The area proposed for the Stage during the summer season is in the middle of the west side of the Resort. The site is located to the east of the "Get Set Go Tree Top Adventure" and to the north of the lake. Furthermore, it should be noted that the PA system related to the Stage, will be set up facing east (towards the Alton Towers Waterpark and JCB test site), away from the nearest noise sensitive residential receivers.

1.10. For the winter season, the Stage will be positioned as you enter Fountain Square, past the ride entrance to Hex. The Stage is proposed to be located on the far right hand side of the Square.

1.11. The following figure illustrates the stage area within the Alton Towers Resort.



Figure 1: The proposed Stage location within Alton Towers Resort

1.12. In order to understand the constraints for the proposed Stage, Alton Towers set up a PA system to assist with the assessment and allow sound measurements to be taken. Due to COVID restrictions a small number of attractions were not operational during the day, however, meaningful sound propagation data between the Stage and the nearest receivers was gathered throughout the day.

1.13. This assessment considers the potential noise impacts from the proposed project to the nearest receivers, located external to Alton Towers boundary. Consideration has been given to receivers to the north, west and south of the attraction.

1.14. The nearest noise sensitive residential receivers (NSRs) from the proposed development have been defined as follows:

- Properties on Wootton Lane, approximately 400m to the north of the Stage
- Properties on Farley Lane, approximately 450m to the west of the Stage
- Properties on the River Churnet, approximately 1230m to the south of the Stage

1.15. All other receivers are at a greater distance than those presented above, with comparable ambient noise levels compared to those above.

1.16. These NSRs are illustrated in the following figure.

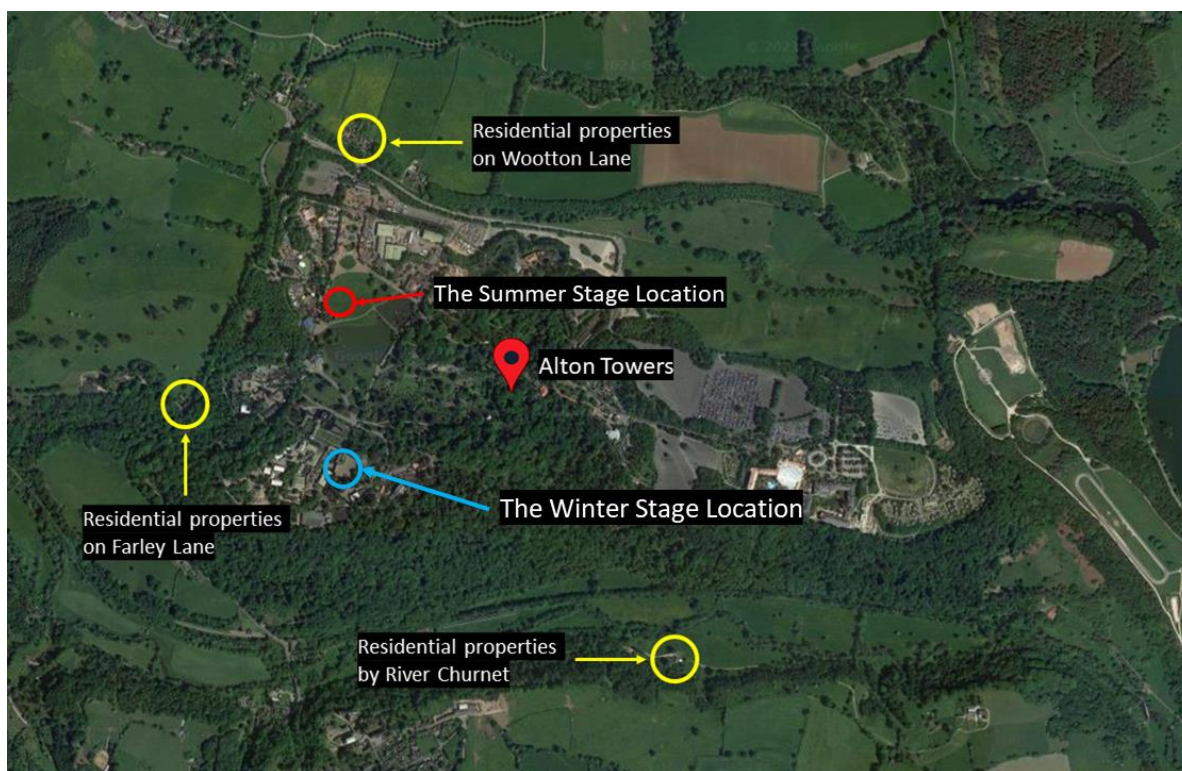


Figure 2: Noise sensitive receivers' locations

1.17. Criteria and calculation methodology have been developed based upon accepted code of practice for the assessment of environmental noise. Further information is provided in Section 3 of this report.

2. Policy & Guidance Documents

2.1. National & Local Policy and Guidance

Noise Policy Statement for England

2.2. The Noise Policy Statement for England (NPSE) applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise but does not apply to noise in the workplace. The Government recognises that the effective management of noise requires a coordinated and long-term approach that encompasses many aspects of modern society.

2.3. The long-term vision of Government noise policy is set out to promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

2.4. This long-term vision is supported by three aims:

- avoid significant adverse impacts on health and quality of life,
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

National Planning Policy Framework, 2019 (NPPF)

2.5. The National Planning Policy Framework (NPPF) includes the following statements relating to noise and the requirement to take it into account in the planning process:

2.6. Section 15, 170 (e) states:

- Decisions should contribute to and enhance the natural 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.

2.7. Section 16, 180 states

- (a) new development should mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life,
- (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.

2.8. The NPPF does not therefore provide absolute limits on noise that are acceptable or unacceptable in a given situation. It does, however, set out the need to use planning decisions, including using conditions, to avoid or mitigate adverse impacts on health and quality of life resulting from noise.

The Control of Pollution Act 1974

2.9. The Control of Pollution Act 1974 Section 61 sets out the procedures whereby contractors may obtain 'Prior Consent' for construction works within agreed noise limits. Applications for such consents would be made to the local authority and would contain a construction method statement and the steps to be taken to minimise noise. The local authority has the power to attach conditions to any consent given.

The Environmental Protection Act 1990

2.10. Under Part III of the Environmental Protection Act 1990 as amended by the Noise and Statutory Nuisance Act 1993, local authorities have a duty to investigate noise complaints relating to a variety of sources, excluding road traffic noise. If the local authority is satisfied that the noise amounts to a statutory nuisance it will serve an Abatement Notice which may require that the noise be stopped altogether or limited to certain times.

3. Assessment Methodology

3.1. The following British Standards, Codes of Practice and references have been referred to and used as part of the assessment:

Code of Practice on Environmental Noise at Concerts

3.2. This Code of Practice produced by the Noise Council outlines methodology and appropriate noise levels for the assessment of sound from concerts.

3.3. The following table is taken from the Code and outlines limits for Music Noise Levels (MNL) during concerts, measured at 1m from the facade of noise sensitive premises. These apply to events held between the hours of 09:00 to 23:00.

Table 1: Maximum Music Noise Levels (MNL) in accordance with Code of Practice

Concert days per calendar year, per venue	Venue Category	Guideline MNL
1 to 3	Urban stadia or arenas	The MNL would not exceed 75dBA over a 15-minute period.
1 to 3	Other urban and rural venues	The MNL would not exceed 65dBA over a 15-minute period.
4 to 12	All venues	The MNL would not exceed the background noise level by more than 15dBA over a 15-minute period.

Notes:

- The MNL value used should be the arithmetic average of the hourly LA90 measured over the last 4 hours of the proposed music event or over the entire period of the proposed music event if scheduled to last more than 4 hours.
- For those venues where more than three events per calendar year are expected, the frequency and scheduling of the events will affect the level of disturbance. In particular, additional disturbance can arise if events occur on more than three consecutive days without a reduction in the permitted MNL.

3.4. Low frequency sound (63Hz and 125Hz) impact is also addressed within the Code. As a guideline, the Code states that noise levels of 70dB in the 63Hz and 125Hz octave bands may be considered acceptable, whilst levels of 80dBA and above may cause significant disturbance.

3.5. Although the number of Shows is likely to be more than 12, given the small scale nature of the Stage, the 4-12 events criteria is considered a suitable threshold, i.e. 15 dB above background noise levels.

4. Consultation

4.1. Consultation has not been undertaken with the Local Authority for this project regarding appropriate criteria and methodology to be referenced for the assessment of operational noise from proposed Stage project.

4.2. However, the receiver locations assessed have been previously accepted by the Local Authority for noise assessments for other attractions.

4.3. For the purposes of this assessment the nearest residential receivers to the proposed development have been defined as follows:

- North of the proposed attraction - Properties on Wootton Lane, approximately 400m.
- West of the proposed attraction - Properties on Farley Lane, approximately 450m.
- South of the proposed attraction - Properties on the River Churnet, approximately 1230m.

5. Proposed Criteria

5.1. For the purposes of this assessment, the following criteria has been used as a guideline.

5.2. Operational impacts have been considered in accordance with the Code of Practice on Environmental Noise at Concerts (CPENC).

5.3. The Stage is expected to operate for a maximum of 262 days per year, however, it is likely that the actual number of operational days will be substantially less than this, due to weather and other constraints. A total of 6 – 10 shows are proposed per day.

5.4. Therefore, for the purposes of this assessment guidance from both CPENC was followed.

5.5. Following guidance from CPENC, the option of 4-12 events per year can be referenced. The requirements are outlined in the table below.

Table 2: Proposed criteria for operational sound from The Stage Project (CPENC)

Number of events	Maximum noise level at receivers $L_{Aeq,15mins}$	Maximum L_{Aeq} 63Hz and 125Hz
4-12	The MNL would not exceed the background noise level by more than 15dBA over a 15-minute period.	<70 dB

5.6. In addition, low frequency sound in the 63Hz and 125Hz frequency bands will be controlled so as not to exceed the recommendations outlined within the Code of Practice on Environmental Noise at Concerts

6. Baseline Data Collection

6.1. A number of baseline surveys were undertaken around the proximity of Alton Towers Resort, over representative day time hours, to establish the sound environment of the vicinity. This included measurements with both the PA operational and without the PA, at the summer location.

6.2. In terms of proximity to receivers, the summer location presents the worst case, compared to the winter location. Noise levels at 10m from the Stage would be the same for both locations. Therefore, measurements were only taken at the summer location. Assessment has been undertaken for both locations.

6.3. The surveys were undertaken while COVID restrictions were in place, however, a number of Alton Towers attractions were operational and road traffic flows were noted as high. It should be noted that levels were generally lower than pre pandemic survey results, 2018, so present a worst case.

6.4. Measurements were taken at a number of receiver locations around the perimeter of the Alton Towers Resort, including Wootton Lane, Farley lane and by the River Churnet on Thursday 15th April 2021. Measurements were undertaken during daytime hours, whilst the resort was open.

6.5. Additional measurements were undertaken at each location while the music from the PA system was operational at maximum proposed show level (i.e. worst case).

6.6. The measurement equipment was calibrated before and after measurements were taken and no drift was observed.

6.7. Meteorological conditions during the measurement period were in line with recommendations for environmental noise surveys, with minimal wind (<5m/s) during all surveys. The air temperature fluctuated between 9-12°C, and the cloud cover was minimal during the surveys.

6.8. Meteorological conditions did not affect the measurement results.

6.9. Several measurements were taken at each defined location. Measurements were undertaken over 5-minute time periods. The measurement locations are shown in the following Figure.

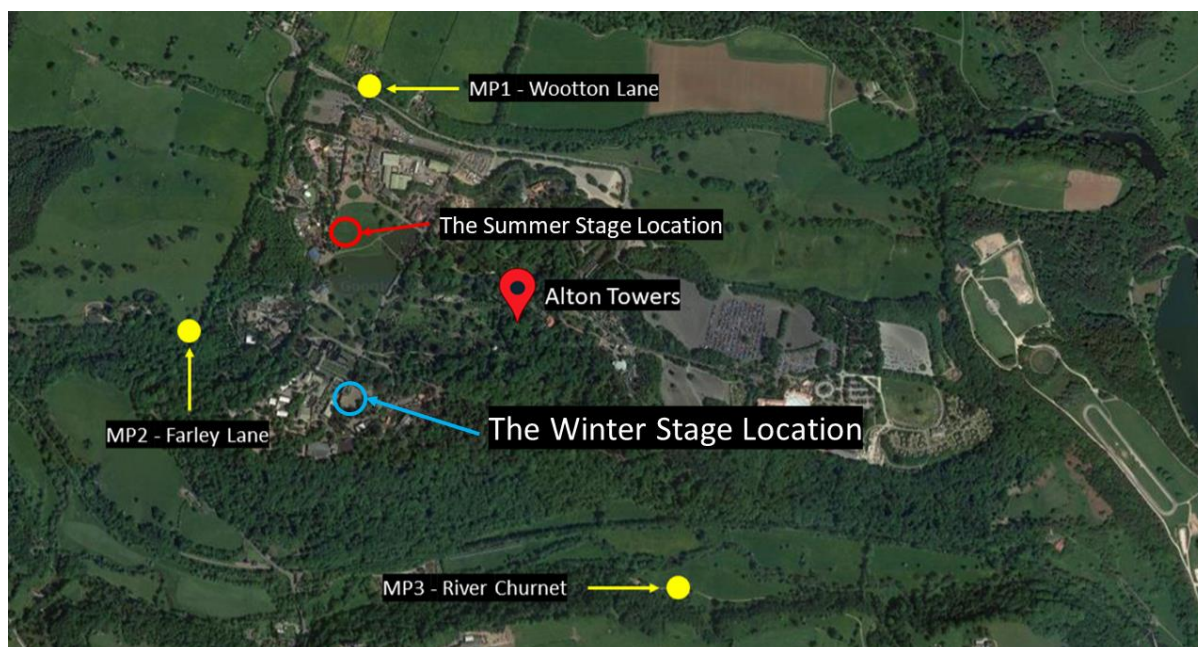


Figure 3: Measurement Positions

6.10. The measurement positions illustrated in the above figure are further detailed below:

MP1 - Wootton Lane Properties: Measurements undertaken at the boundary with Alton Towers Resort on Wootton Lane, directly adjacent to Wootton Lane residential properties. Road traffic noise and birds chirping dominate the soundscape at this location.

MP2 - Farley Lane Pink Lodge: Measurements undertaken at the boundary with Alton Towers Resort on Farley lane, around 1.5m away from the Pink lodge front facade. Cars using Farley lane and screams from the attractions in Alton Towers Resort dominate the soundscape at this location.

MP3 – River Churnet Properties: Measurements undertaken close to the residential properties located in the fields adjacent to the River Churnet south to the Alton Towers Resort. The soundscape of this location is dominated by river and bird sounds as it is generally very quiet. In addition, occasional activity noise from Alton Towers Resort, dog walkers and wildlife sounds can be heard.

6.11. The following table outlines the averaged results of the measurements. The L_{Aeq} values are the logarithmic averages, the L_{Amax} values are the 90th percentile, and the L_{A90} values are the arithmetic average of values measured.

Table 3: Averaged measured noise levels

Measurement location	MP1 – Wootton Lane Properties		MP2 – Farley Lane Pink Lodge		MP3 – River Churnet Properties	
	No PA	PA Operating	No PA	PA Operating	No PA	PA Operating
$L_{Aeq,5mins}$ dB	62	61	68	67	50	45
$L_{Amax,5mins}$ dB	78	77	87	85	69	62
$L_{A90,5mins}$ dB	39	37	54	54	43	43

6.12. The above levels form the basis of the assessment undertaken for this project.

7. Operational Noise Assessment

Transportation

7.1. A traffic assessment has not been undertaken to support the planning application for the proposed events as the visitors who attend Alton Towers for the Stage Project, would be visiting the resort anyway, and therefore, no increases in traffic flows are predicted.

7.2. The resort will not exceed its maximum attendance capacity numbers. The Stage is proposed merely provide an addition attraction to add to the existing offering at the Resort. This is seen as important for the Resort, particularly during COVID period.

7.3. Therefore, the predicted impact of sound relating directly to operational transportation for these events, would be “no change”.

Mechanical & Electrical Services Noise

7.4. It is understood that there will not be any temporary mechanical or electrical plant introduced as part of the music events.

7.5. Therefore, sound from building services has not been considered further.

Sound from the Stage Shows

7.6. To understand the nature and constrains of the proposed events, the surveys were undertaken while Alton Towers Resorts was open to the public, although only partial opening, due to COVID restrictions.

7.7. The PA output (volume) at the Stage was intentionally turned up to a level that was representative of the level proposed for Shows on the Stage and source measurements were taken in front of the Stage. The sound level meter was positioned no more than 10m away from the Stage to avoid noise from general theme park noise affecting the readings.

7.8. Intentionally turning the music up at a known time, while all of the four meters were running, allowed for simultaneous measurements at all locations for a more accurate comparison and to understand the propagation of the sound from the Stage to the surrounding noise sensitive receivers.

7.9. The following table outlines predicted noise levels at the receiver locations based upon noise measurements at 10m from the PA system. The predicted levels are corrected for distance to the receivers and compared to background noise levels at the receivers, without PA operating.

Table 4: Predicted operational noise levels at receivers, from Lawns.

Receiver*	Distance and Location relative to site	Average PA Level at 10m L _{Aeq,5mins} dB	Maximum noise level at receivers L _{Aeq,5mins} dB	Predicted level at receiver, L _{Aeq,5mins} dB	Compliance
Wootton Lane Properties	400m North	87	54 (15dB above 39dB L _{A90})	55	Marginal Not Comply
Farley Lane Properties	450m West	87	69 (15dB above 54dB L _{A90})	54	Comply
Properties by the river Churnet	1230m South	87	58 (15dB above 43dB L _{A90})	45	Comply

* All locations are also benefitted by significant directivity losses as the speakers are pointing away from each location (east facing). These are not Accounted for in the calculations.

7.10. As can be seen from the table above, the measured levels at the residential properties on Farley Lane and by the river Churnet, while the music was on, are complying with the outlined criteria requirements of 15dB above existing background levels. These locations result in 'equal to background' and '2 dB above background' levels.

7.11. Properties on Wootton Lane are predicted to have an L_{Aeq,5mins} that is 1dB higher than the requirements. Nevertheless, 1dB could be considered as a negligible difference and therefore could be concluded that the properties will not adversely be affected by the events.

7.12. It should also be noted that lower background noise levels were measured on MP1 compared to the other locations and previous historic surveys. This is attributed to the fact that the Resort has just opened after COVID-19 restrictions and was not fully open or occupied. Therefore, less people were visiting, resulting in less traffic on the road that leads to the resort's parking area.

7.13. Previous surveys on Wootton Lane in 2018 showed 10dB higher background noise level for a typical busy day at the Resort (49 dB L_{A90} in 2018, as opposed to 39 dB L_{A90} for this 2021 study).

7.14. In addition to the predicted noise levels, Table 5 shows measurements undertaken with and without PA sound, at the various measurement locations. The results show that the L_{Aeq} levels measured at MP1 (Wootton Lane) with and without music, are 61dB and 62dB, respectively. This shows that there was no change on the background levels as a result of the PA. The below table is repeated from section 6 for ease of comparison.

Table 5: Averaged measured noise levels

Measurement location	MP1 – Wootton Lane Properties		MP2 – Farley Lane Pink Lodge		MP3 – River Churnet Properties	
	No PA	PA Operating	No PA	PA Operating	No PA	PA Operating
L _{Aeq,5mins} dB	62	61	68	67	50	45
L _{Amax,5mins} dB	78	77	87	85	69	62
L _{A90,5mins} dB	39	37	54	54	43	43

7.15. The above measured noise levels show no noticeable difference between 'PA on' and 'PA off' scenarios, at all locations. The fact that the levels measured during the PA operating were similar or lower than the levels without the PA system on, indicate that the background noise in the area is dominated by factors other than the PA, such as road traffic and nature.

7.16. Sound levels at all locations are also expected to be compliant with the outlined criterion for low frequency noise levels, that being the 63 Hz and 125 Hz frequency bands are controlled to below 70 dB. It should be noted that this was the case for all measurements at all locations during the survey.

7.17. It is understood that shows at the Stage will be playing at a lower-level volume, the majority of the time. This lower level was measured at 10m from the stage at 72dB $L_{Aeq,5mins}$, which is 15dB lower than the higher volume, which was measured at 87dB $L_{Aeq,5mins}$. Therefore, the assessment undertaken presents a worst-case scenario.

7.18. The Stage will be moved to an alternate location during the winter period (November to February), as shown on the figure below. However, this change is not expected to have any adverse impact on the nearest noise sensitive receiver as the location is either a similar distance or further away from receivers than the Lawns location.



Figure 4: The Stage project location over winter period

7.19. The table below shows the predicted $L_{A90,5mins}$ level at the nearest receivers when The Stage is moved to the Fountain Square.

Table 6: Predicted operational noise levels at receivers, from Fountain Square

Receiver*	Distance and Location relative to site	Average PA Level at 10m L _{Aeq,5mins} dB	Maximum noise level at receivers L _{Aeq,5mins} dB	Predicted level at receiver, L _{Aeq,5mins} dB	Compliance
Wootton Lane Properties	770m North	87	54 (15dB above 39dB L _{A90})	49	Comply
Farley Lane Properties	415m West	87	69 (15dB above 54dB L _{A90})	55	Comply
Properties by the river Churnet	950m South	87	58 (15dB above 43dB L _{A90})	47	Comply

* All locations are also benefitted by significant directivity losses as the speakers are pointing away from each location (east facing). These are not Accounted for in the calculations.

7.20. The measured levels at all the nearest residential properties, while the music is on, will be complying with the outlined criteria requirements of maximum 15dB above existing background levels.

8. Mitigation

8.1. This assessment for shows to take place on the Stage Project of Alton Towers Resort predicts that all defined NSRs will comply with the adopted criterion outlined in Section 4 and 5 of this report. A marginal 1 dB exceedance is predicted at Wootton Lane, during shows at the Lawns location. This is considered negligible.

8.2. Sound monitoring will be undertaken during sound checks before events commence, to ensure that sound levels to all receivers comply with the requirements of the adopted criteria. During sound check monitoring at the Stage, constant communication between the monitoring engineer and the sound engineer, in charge of the mixing desk, will be maintained to ensure that levels are carefully adjusted to the correct levels.

8.3. Additionally, the speakers used for this project are highly directional speakers and are facing away from all nearest receivers. This ensures that no residential properties are directly exposed to any music that is played on the Stage's speakers.

8.4. Alton Towers is also providing further protection by installing absorbing materials around the speakers to assist with controlling noise levels at source.

8.5. Furthermore, the monitoring will ensure that low frequency sound limits in the 63Hz and 125Hz frequency bands do not exceed the limits outlined in the adopted criterion, that being 70 dBA.

8.6. Additional measures could be to incorporate audio limiters into the Stage PA system to ensure that levels are 'locked' when compliant levels are reached. This will ensure that compliant levels are retained throughout the various events.

8.7. Lastly, as mentioned above, previous surveys undertaken around Alton Towers in 2018 showed higher background noise levels than those measured for this assessment. This was a 10dB increase in background noise levels at Wootton Lane. Therefore, it is expected that during a typical peak day at the Resort the margin of compliance would be increased further and limits will be met easily at all locations.

9. Residual Effects

9.1. No residual effects are predicted from the proposed events after the mitigation outlined in section 8 of this report are followed.

10. Conclusions

10.1. This report outlines the assessment and findings relating to a sound assessment for the proposed new attraction, located within Alton Towers Resort. At the time of writing the area was known as The Stage.

10.2. Shows at the Stage will run throughout the summer and winter seasons at the Resort and will comprise a number of amplified speech and music performances. Shows will not start before 10am. Final show times will vary but no shows will be played later than 10pm. It is expected that 6-10 shows will be hosted on days when the stage is operational.

10.3. A series of noise surveys were undertaken to establish representative ambient noise levels at noise sensitive receivers (NSRs) around the perimeter of Alton Towers Resort and representative source levels at 10m away from the Stage. These measurements form the basis of the assessments undertaken.

10.4. An assessment has been undertaken with relation to noise from operational activities from the proposed stage. This report outlines the requirements for maximum noise levels from the site, in order to achieve the prescribed planning requirements.

10.5. When assessed in accordance with the adopted criteria, based on the Code of Practice on Environmental Noise at Concerts, all noise sensitive receivers are expected to comply with the requirements for appropriate sound levels.

10.6. The predicted noise level at the properties on Wootton Lane is very marginally above the desired limit, by 1 dB. This is seen as negligible in terms of assessment and is considered to comply. Even so, this report outlines mitigation recommendations to ensure that this location complies with the criteria. The mitigation recommendations are easy to implement.

10.7. Furthermore, assessment undertaken for the alternate location of the Stage, during the winter period, also showed that all noise sensitive receivers are expected to comply with the outlined assessment requirements and appropriate sound levels will be achieved.

10.8. The Stage will ensure that sound monitoring will be undertaken during sound checks before events commence. This will ensure that sound levels to all receivers comply with the requirements of the adopted criteria.

10.9. Furthermore, the monitoring will ensure that low frequency sound limits in the 63Hz and 25Hz frequency bands do not exceed the limits outlined in the adopted criterion.

10.10. Based upon the above it can be seen that the proposed events will comply with the adopted criteria and will be improved when mitigation controls are put in place, as proposed.