High Ropes Course, Alton Towers

Sound Assessment Report

Merlin Entertainments Limited.

November 2014

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Table of contents

Chapter Pages

Executive Summary **4**

1. Introduction **5**

2. Policy & Guidance Documents **7**
2.1. National Policy and Guidance 7

3. Assessment Methodology **9**
Alton Towers Resort Court Abatement Order 9
BS8233:2014 Guidance on sound insulation and noise reduction for buildings 10
BS5228-2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise 10

4. Proposed Criteria **13**

5. Baseline Data Collection **13**

6. Construction Noise Assessment **15**

7. Operational Noise Assessment **17**

Transportation 17

Building Services Noise **17**

Noise from Visitor Activities **17**

8. Mitigation **19**

9. Residual Effects **19**

10. Conclusions **20**

Tables

Table 1 Indoor Ambient Noise Levels for Dwellings (ref. BS8233) 10
Table 2 Construction Activity Noise Levels: Example Threshold of Potential Significant Effect at Dwellings (BS5228-1:2009+A1:2014) 11
Table 3 DMRB Noise Changes and Magnitude of Opening Year Impacts 12
Table 4: Noise levels used for assessment 14
Table 5 Assumed construction equipment and associated noise levels (ref. BS5228) 15
Table 6 Construction noise assessment in accordance with BS5228 A, B, C method 16
Table 7 Operational noise assessment results 18

Figures

Figure 1 Location of proposed attraction within Alton Towers Resort 6
Figure 2 High Ropes Course Block Plan 7
Figure 3 Defined NSRs in relation to the proposed High Ropes Course 14

Executive Summary

This report outlines the assessment and findings relating to a sound assessment for the proposed High Ropes Course, at Alton Towers Resort.

It is anticipated that construction for the High Ropes Course will begin in February 2015 and be completed by the middle of May 2015. It is intended that the attraction will be open to the general public from the end of May 2015.

Subject to obtaining the required approved, it is understood that the High Ropes Course will attract between 250-300 people per day during peak times. This number would be reduced during other times of the year, particularly the winter season. It is further estimated that 60-80 persons would be using the course at any one time.

Baseline noise levels have been provided, based upon assessments for other attractions on the site. These levels have been used for the assessment of noise from construction and operations directly related to the proposed attraction.

An assessment has been undertaken in relation to potential construction impacts. This relates to both construction traffic and construction activities, throughout the construction duration. Construction traffic is not expected to increase existing noise levels at defined noise sensitive receivers (NSRs). This is due to the existing numbers of cars, coaches / buses and delivery vehicles that currently enter and leave Alton Towers Resort on a daily basis. An assessment of construction activities has also been undertaken, in accordance with BS5228, based upon the assumed construction programme activities. The assessment predicts that there will not be any significant impacts to defined receivers.

An operational noise assessment has been undertaken based upon potential impacts from operational traffic, building services noise and general visitor noise. Based upon traffic data provided in the transport assessment report, changes in traffic due to the proposed attraction will result in 'No Change' to the ambient noise levels.

Building services noise has been considered. There is no external plant proposed for the attraction, therefore, mechanical and electrical plant has not been considered further.

Consideration has been given to operational noise from visitor activities. The assessment predicts that sound from operations will comply with the requirements of the Court Abatement Order and BS8233 recommendations.

Therefore operational noise from the attraction itself will have no impact on receivers.

No adverse impacts relating to sound from construction and operational activities from the High Ropes Course are predicted.

1. Introduction

1.1. CDC has been commissioned by Merlin Entertainments, Alton Towers Resort (ATR) to assess the impact from sound relating to the proposed High Ropes Course, to the nearest Noise Sensitive Receptors (NSR), located outside the Resort.

1.2. This assessment considers the potential sound impacts from the proposed attraction to off Resort receivers, from both construction and operational activities.

1.3. The proposed High Ropes Course is located to the east of the Alton Towers Resort, in an area just north of the Alton Towers Hotel and Spa. The Alton Towers Resort car parks are located directly to the west, south and east of this area.

1.4. The proposal includes the development of the High Ropes Course and the erection of a new building to provide support facilities, including an office, café and toilets.

1.5. It is anticipated that construction for the High Ropes Course will begin in February 2015 and be completed by the middle of May 2015. It is intended that the attraction will be open to the general public from the end of May 2015.

1.6. It is understood that the High Ropes Course will attract between 250-300 people per day during peak times. This number would be reduced during other times of the year. It is further estimated that 60-80 persons would be using the course at any one time.

1.7. The nearest noise sensitive receivers (NSRs) to the proposed attraction are Lower Ground Farm, located to the north of the proposed attraction on Wooton Lane, and Crump Wood Farm, located to the south of the proposed attraction. The sound propagation paths between the proposed attraction and the NSRs is soft ground, across fields and wooded areas.

1.8. Baseline noise data at these locations have been referenced from recent surveys, relating to noise assessments for other attractions.

1.9. A noise limit based on a previously issued court abatement order has been considered and has been adopted here as the noise limit that should be met at the NSRs. Other standards and assessment methodologies have also been used as part of this assessment.

1.10. The following figures illustrate the location of the proposed High Ropes Course within the Resort and the High Ropes Course block plan.

Figure 1 Location of proposed attraction within Alton Towers Resort

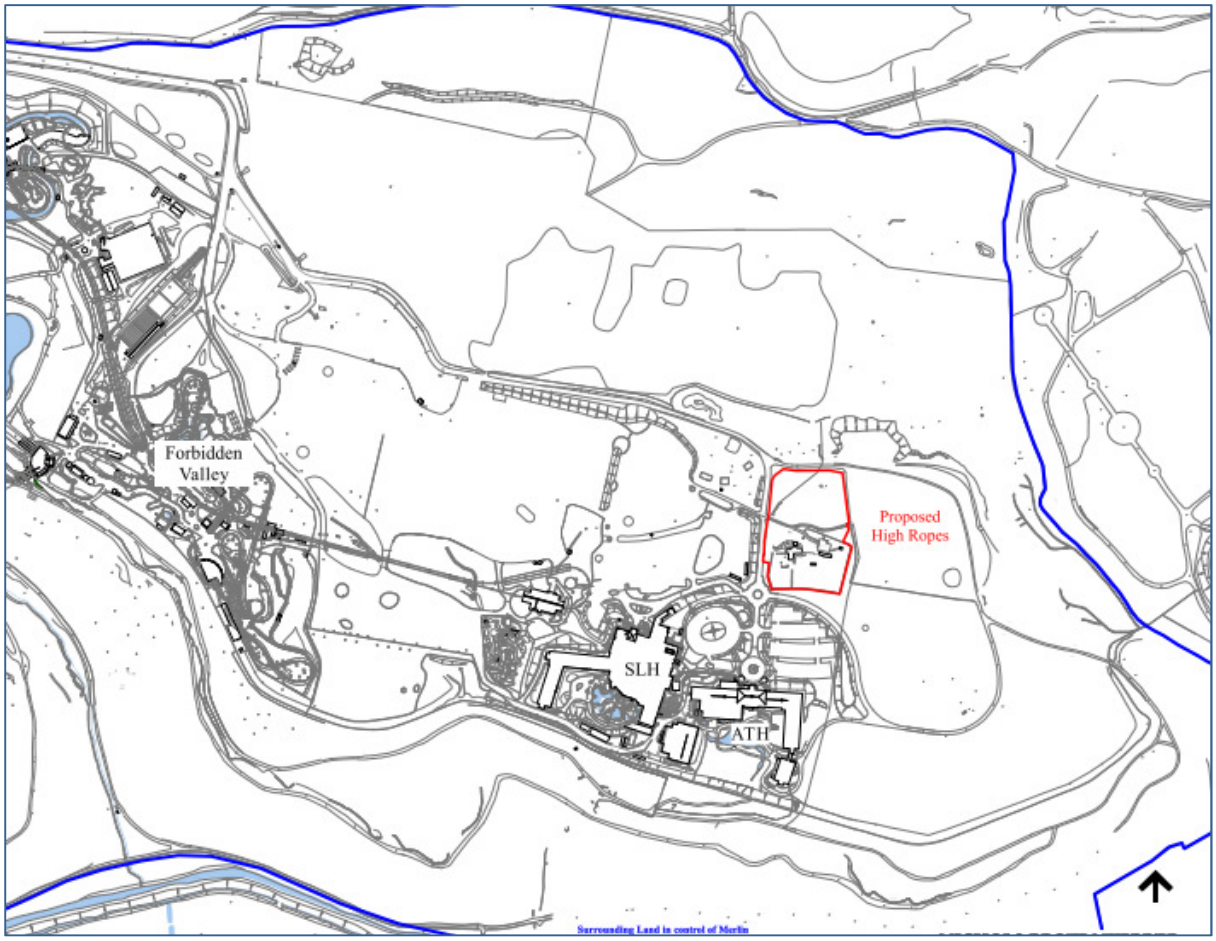
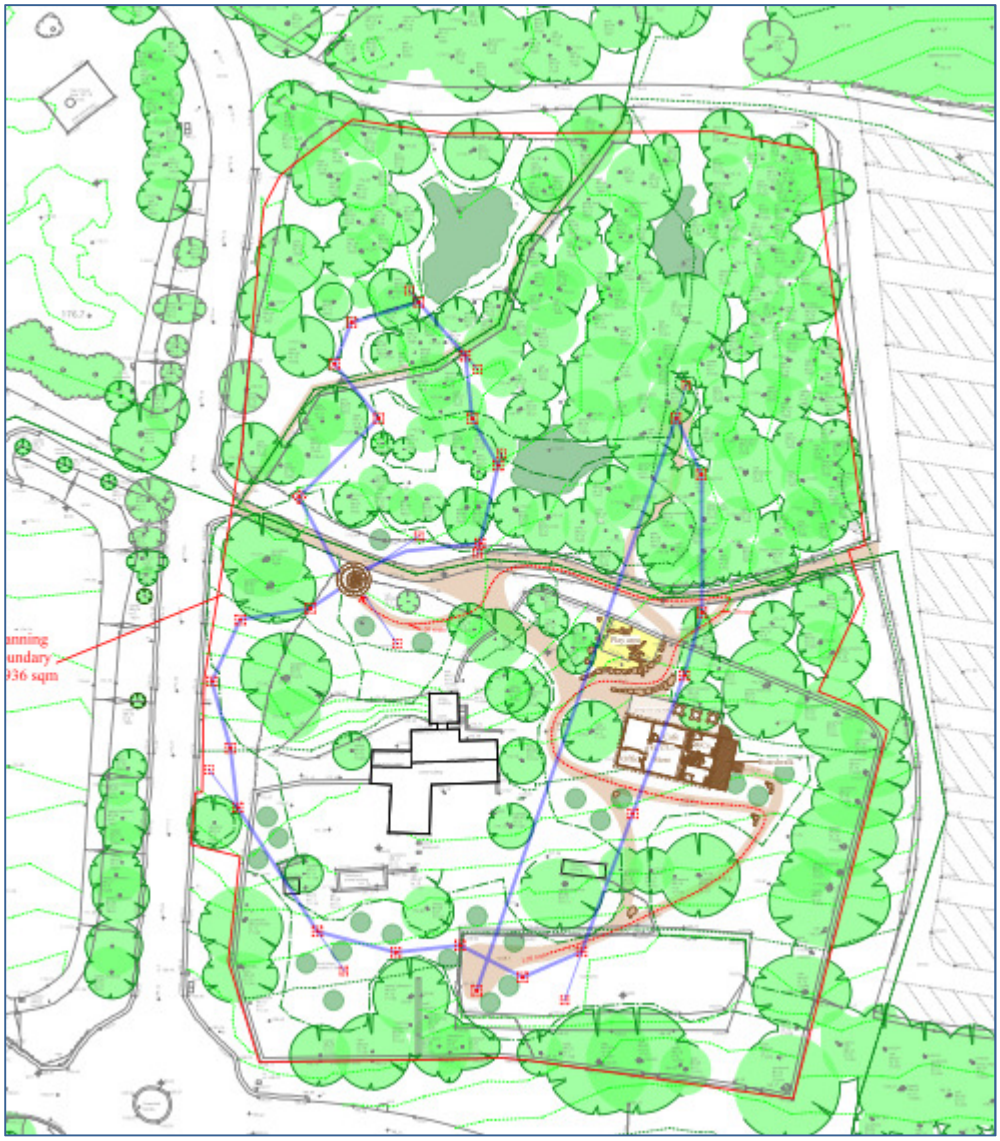


Figure 2 High Ropes Course Block Plan



2. Policy & Guidance Documents

2.1. National 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 co-ordinated 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, 2012 (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 109 indicates that "The planning system should contribute to and enhance the natural and local environment by:

- preventing both new and existing development from contributing to or 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 123 indicates that "Planning policies and decisions should aim to:

- avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established[1]; and
- identify and protect areas of tranquillity 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 through the use of 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.

[1] The NPPF contains the caveat "Subject to the provisions of the Environmental Protection Act 1990 and other relevant law".

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:

- Court Abatement Order in place for Alton Towers Resort, 2007;
- Construction noise activities have been considered in accordance with methodology and data contained within BS5228-2009+A1:2014 'Code of Practice for noise and vibration from construction and open sites-Part 1';
- Traffic noise impacts have been considered in accordance with guidance within DMRB (Design Manual for Roads and Bridges) and CRTN (Calculation of Road Traffic Noise);
- Mechanical plant has been considered in accordance with BS4142:1997, 'Method for rating industrial noise affecting mixed residential and industrial areas';
- 'BS8233:2014 Guidance on sound insulation and noise reduction for buildings'.

Alton Towers Resort Court Abatement Order

3.2. It is understood that a court abatement order was issued to Tussauds Theme Parks Limited in 2007. At the time of the abatement order Alton Towers was a division of Tussauds Theme Parks Limited.

3.3. In accordance with the court abatement order, the following boundary free-field SPL limit should not be exceeded at the boundary of Farley House located on Farley Lane. It is also understood that the following SPL limit includes an acoustic characteristic feature correction.

- Free-field boundary SPL limit : LAeq,1hr = 40dB (including "adjustment for character of noise").

3.4. This noise limit shall not to be exceeded "individually or cumulatively" by the noise sources from the Alton Towers Resort.

3.5. In this report the noise level set out in the court abatement order has been adopted as the noise criterion that should be met by the proposed attraction and has been applied to all defined NSRs. However, the Lower Ground Farm receiver, to the north of the site, is the closest and presents a worst case. Other standards and guidelines have also been used as part of this assessment.

BS8233:2014 Guidance on sound insulation and noise reduction for buildings

3.6. This Standard provides information and guidance on sound insulation and noise reduction for buildings. It deals with the control of external noise and outlines recommendations for occupied rooms.

3.7. The following table is taken from the document outlining requirements for internal noise levels in residential accommodation.

Table 1 Indoor Ambient Noise Levels for Dwellings (ref. BS8233)

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35dB $L_{Aeq,16Hr}$	-
Dining	Dining Room/Area	40dB $L_{Aeq,16Hr}$	-
Sleeping	Bedroom	35dB $L_{Aeq,16Hr}$	30dB $L_{Aeq,8Hr}$

3.8. The noise levels presented are based on existing WHO guideline values. The document further recommends that guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values.

3.9. BS8233 states that if a building is basing a design on closed windows to meet the guideline values, there needs to be appropriate alternative ventilation that does not compromise the facade insulation or resulting noise level.

3.10. BS8233 also states that where a development is considered necessary or desirable, the internal target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved.

3.11. Regarding outdoor spaces, such as gardens and balconies, it is recommended that the steady noise levels do not exceed 50 dB $L_{Aeq,T,}$ with an upper limit of 55 dB $L_{Aeq,T}$. BS8233 recognises that these guideline values are not achievable in all circumstances where development may be desirable. In higher noise areas, such as city-centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors such as the convenience of living in these locations might be warranted. In such a situation the development should not be prohibited, but should be designed to achieve the lowest noise levels practicable in external amenity spaces.

BS5228-2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise

3.12. There are no statutory limits regarding construction noise. BS5228-1:2009+A1:2014 '*Code of practice for noise and vibration control on construction and open site – Part 1: Noise*', provides guidance on assessing the potential significance of noise effects from construction activities in Annex E. Within the guidance there are two approaches described for threshold limits and noise level changes.

3.13. The following table has been reproduced from table E.1 in BS5228-1:2009+A1:2014, and shows the 'ABC criteria' thresholds for potential significant effect.

3.14. The ambient noise level is determined through baseline noise survey at, or within the vicinity of, the nearest residential properties and then rounded to the nearest 5dB to determine the

appropriate category (A, B or C) and subsequent threshold value. This is compared with the noise level predicted from construction activity. A potential significant effect is indicated if the construction noise level exceeds the appropriate category threshold value. If the existing ambient level exceeds the threshold category threshold values, then a potential significant impact is indicated if the total noise level, including both the ambient noise and the various contributions of construction noise, is greater than the ambient noise level by more than 3dB.

Table 2 Construction Activity Noise Levels: Example Threshold of Potential Significant Effect at Dwellings (BS5228-1:2009+A1:2014)

Assessment Category and Threshold Value Period	Threshold Value in decibels (dB) ($L_{Aeq,T}$)		
	Category A [A)]	Category B [B)]	Category C [C)]
Night-Time (23:00 – 07:00)	45	50	55
Evenings and Weekends [D)]	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
NOTE 1: A potential significant effect is indicated if the total $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the Category appropriate to the ambient noise level.			
NOTE 2: If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3dB due to site noise.			
NOTE 3: Applied to residential receptors only.			
A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.			
B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.			
C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.			
D) 19:00 – 23:00 Weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.			

Department for Transport Memorandum, Calculation of Road Traffic Noise, 1988

3.15. The Department for Transport Memorandum, Calculation of Road Traffic Noise provides methods for measuring and calculating noise levels from road traffic, which is assessed over an 18 hour period from 06:00 to 24:00, using annual average weekday traffic (AAWT) flows. The basic noise level for a road segment can be calculated using the traffic flow, traffic speed and percentage heavy vehicles for a road segment. The traffic data will be based on the construction methods that are to be employed and information from the traffic assessment (TA).

Design Manual for Roads and Bridges part 11:3:7

3.16. The advice note entitled 'Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7 HD 213/11 Noise and Vibration' dated 2011 provides guidance on the assessment of the impacts that road projects may have on levels of noise and vibration. Where appropriate, this advice may be applied to existing roads.

3.17. It provides guidance on the significance of changes in road traffic noise, identifying that changes in noise smaller than 1 dBA are not perceptible in the short term. Assuming no changes to percentage composition of heavy goods vehicles or traffic speeds, an increase in traffic volume of 25% is required to alter the noise levels by 1 dBA.

3.18. The advice note gives an example classification of magnitude of impacts for opening year road traffic noise impacts, as shown in Table 3:

Table 3 DMRB Noise Changes and Magnitude of Opening Year Impacts

Noise change, $L_{A10,18h}$	Magnitude of Impact
0	No change
0.1 – 0.9	Negligible
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

3.19. Although advice is given on the magnitude of impacts, no specific guidance is provided on the significance of the effect of these changes.

BS 4142: 1997 Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas

3.20. BS 4142:1997 describes methods for determining and assessing noise levels from fixed plant with a view to determining the likelihood of complaints.

3.21. The likelihood of complaints about noise from the occupiers of nearby residential properties can be assessed using the method described in BS4142:1997. This method compares the rating noise level to the measured background noise level in the absence of the source. Rating noise level is defined as the noise level from the source, adjusted for certain acoustical features. It is measured in terms of dB L_{Aeq} which is an energy based acoustic indicator. The standard defines the 'specific noise level' as the L_{Aeq} of the source, and the 'background level' as the L_{A90} level without the source operating.

3.22. Guidance on how to measure the background noise level, L_{A90}, is also provided in the standard. The length of measurement should be sufficient to obtain a representative value for the background noise level and should cover all periods when the specific noise will operate.

3.23. The standard states that "Certain acoustic features can increase the likelihood of complaint over that expected from a simple comparison between the specific noise level and the background noise level. Where present at the assessment location, such features are taken into account by adding +5 dBA to the specific noise level to obtain the rating noise level. A +5 dBA correction is applied if one or more of the following features occur, or are expected to be present for new or modified noise sources:

- The noise contains a distinguishable, discrete, continuous note (whine, hiss, screech, hum, etc.).

- The noise contains distinct impulses (bangs, clicks, clatters, or thumps).
- The noise is irregular enough to attract attention.

The standard then rates the likelihood of complaints by comparing the rating noise level with the background noise level:

- Where the rating noise level is more than 10 dB above the background level, then complaints are likely.
- Where the rating noise level is more than 10 dB below the background noise level, then this is a positive indication that complaints are unlikely.
- Where the rating noise level is 5 dB above the background noise level, then this is of marginal significance.

4. Proposed Criteria

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

4.2. Impacts relating to transportation have been assessed in accordance with criteria outlined within DMRB, based upon changes in ambient noise levels. This relates to both construction and operational transportation.

4.3. Noise from construction activities have been assessed in accordance with guidance outlined within BS5228. In this instance, based upon ambient noise levels at receivers, the Threshold value is 65 dB $L_{Aeq.}$ Predicted construction noise impacts above this Threshold would be deemed a 'significant' impact. Where levels are predicted to be below the Threshold, impacts are deemed not to be 'significant'.

4.4. Operational impacts, including those from building services and operational activities (mechanisms and participant noise), have been assessed with due consideration of the Noise Abatement Order and BS8233. The Noise Abatement Order requires noise levels not to exceed 40 dB$L_{Aeq,1\ hr}$. Compliance with this level will also ensure that the requirements of BS8233 will also be achieved for external sound and internal noise levels. BS4142 has also been used for comparative purposes.

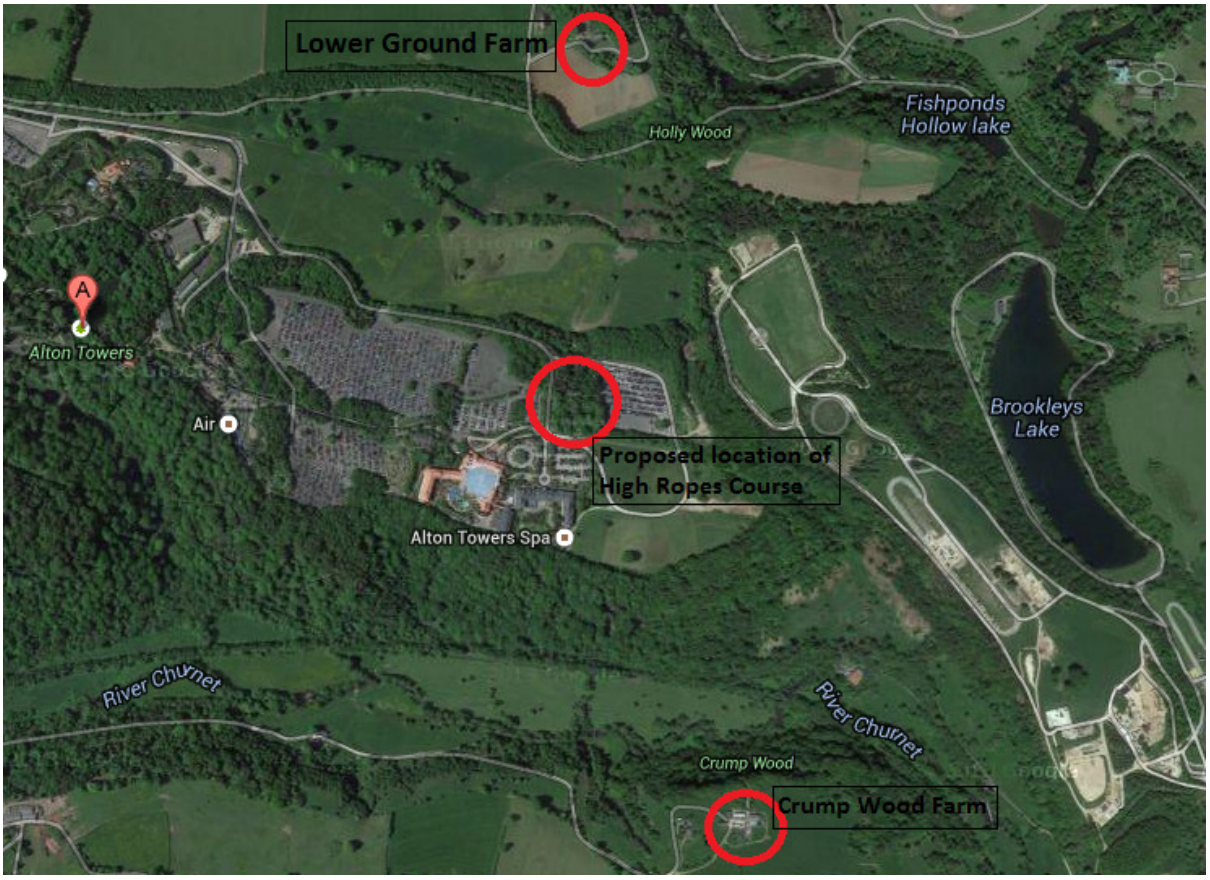
5. Baseline Data Collection

5.1. Baseline data has been provided by Alton Towers Resort, based upon other studies undertaken for the site, specifically the assessment undertaken for the new accommodation, located within this area of the Resort.

5.2. The closest noise sensitive receivers (NSRs) have been defined around the vicinity of the site. These are the closest receivers to the proposed attraction. Other receivers at a greater distance from the proposed attraction have not been considered.

5.3. The NSRs considered are outlined in the following figure.

Figure 3 Defined NSRs in relation to the proposed High Ropes Course



5.4. Measurements have been undertaken at these locations over a number of years. For the purposes of this assessment, the most recent data from 2009 has been used. The lowest daytime background noise levels have been used. These levels have also been used for construction and operational noise assessments and would present a worst case scenario in this respect.

Table 4: Noise levels used for assessment

Location	Date of measurement	L_{Aeq} dB	Lowest measured L_{A90} dB, during measurement period	Closest distance from proposed attraction to receiver
Lower Ground Farm, Wootton Lane, north of the proposed attraction.	23/09/2009	49 dB	42 dB	550m
Crump Wood Farm, south of the proposed attraction.	23/09/2009	43 dB	32 dB	760m

6. Construction Noise Assessment

Construction Traffic

6.1. It is anticipated that any construction traffic would use the main ATR Farley Road entrance to enter and leave the site.

6.2. It is anticipated that the first four weeks of the construction period will be the most intense, with delivery vehicles being required to bring steel poles, timber and other materials to ATR. The first four weeks of the construction period are likely to result in six delivery vehicles per week. After this period a maximum of two delivery vehicles per week are anticipated. During this period it is anticipated that up to ten construction staff will be on site, arriving in up to four vehicles.

6.3. The number of anticipated vehicles directly related to the construction phase is a small percentage of the overall traffic flows relating to ATR.

6.4. In terms of noise impacts from transportation, anything less than a 25% increase in flows equates to a change of less than 1 dB and so is not considered an impact. In this case the predicted flows from construction traffic will be significantly less than 25% and so the impact is considered as 'No Change'.

6.5. Therefore, the impact from construction traffic is expected to be 'No Change'.

Construction Activities

6.6. It is understood that the construction phases will include a period of deliveries of machinery and unloading of timber and steel poles. The floor area may need to be levelled in certain areas to allow for safe working at height. As the construction develops the poles and timber are installed with assistance of excavators, telescopic handlers and hand tools for fixing.

6.7. During the early stages of the construction phase, demolition of a small unused outbuilding is proposed. This is anticipated to be undertaken simultaneously with the early stages of construction for the High Tree Course.

6.8. In place of the demolished building, a new building is proposed to be constructed. The new building will be a timber clad construction, measuring 12.5m x 6.7m and will be approximately 4m high, including the pitched roof.

6.9. For the purposes of this assessment, it has been assumed that the following construction plant is likely to be operational simultaneously during the construction stages, which is anticipated to last for three months.

6.10. Based upon measured ambient levels at the two defined NSRs, the Threshold value for significance has been defined as 65 dBL_{Aeq}. Predicted construction noise impacts above this Threshold would be deemed a 'significant' impact. For levels predicted to be below the Threshold, impacts are deemed not to be 'significant'.

Table 5 Assumed construction equipment and associated noise levels (ref. BS5228)

Assumed Construction Equipment	L_{Aeq} (dB) at 10m

Dozer 20 tonne	75
Concrete mixer truck (discharging) & concrete pump (pumping)	75
Tracked Excavator 14 tonne	70
Telescopic Handler 10 tonne	71
Roller 18 tonne	73
Hand held electric circular saw x 2	84
Compressors for hand tools x 2	73
Club hammer x 2	82
Total (dB) L_{Aeq} at 10m	**87**

6.11. Assuming the above equipment all operates simultaneously at the proposed attraction, the resulting noise level would be 87 dB (A) at 10m from the sources.

6.12. The following table outlines the predicted impact from construction activities. Threshold values have been based upon construction activities taking place between 19:00 – 23:00 Weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

Table 6 Construction noise assessment in accordance with BS5228 A, B, C method

Nearest Receiver	Threshold Value, in accordance with BS5228 (dB)	Predicted noise level (construction + ambient)	Significant Impact Predicted
Lower Ground Farm, Wootton Lane, north of the proposed attraction.	65	54	No Significant Impact Predicted
Crump Wood Farm, south of the proposed attraction.	65	50	No Significant Impact Predicted

6.13. It can be seen from the above assessment that the predicted construction levels do not exceed the outlined Threshold Value as outlined in BS5228. Therefore, no significant impact is predicted from construction activities.

6.14. This assessment is based upon outlined plant equipment being used and forms the basis of the highest noise emitting noise activities on the site. The Threshold value given allows for construction activities between Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00).

6.15. Soft ground corrections and shielding from other ATR buildings have not been considered in this instance and would reduce the predicted levels further.

7. Operational Noise Assessment

Transportation

7.1. A traffic assessment has been undertaken to support the planning application for the proposed High Ropes Course.

7.2. The traffic assessment report concluded that traffic related to ATR would not increase due to the addition of the High Ropes Course. It was concluded that persons using the Course would be visiting the Resort anyway, therefore traffic flows would not change as a result of the Course. It is further postulated that the attraction has the potential to stagger times that people leave ATR, thus potentially reducing the flows out of the Resort at peak times. Therefore, noise levels from transportation will not increase as a result of the new attraction. 'No Change' is predicted.

7.3. An additional seven staff will be recruited for the High Ropes Course. As with existing staff, the new staff will be part of the Alton Towers Resort Employee Travel Plan, which encourages use of existing transport measures, such as public transportation, to allow staff to travel to and from the site.

7.4. Due to the small numbers of additional staff, directly relating to the High Ropes Course, the predicted impact relating to sound is 'No Change'.

7.5. Therefore, the predicted impact of sound, related to the High Ropes Course operational transportation, would be 'no change'.

Building Services Noise

7.6. It is understood that there will not be any new mechanical or electrical plant introduced as part of the High Ropes Course attraction.

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

Noise from Visitor Activities

7.8. It is expected that the main operational sources of sound from the High Rope Course would be from course elements such as mechanisms for zip wires and participant noise, i.e. shouts. There are no hydraulic systems proposed for the attraction.

7.9. The High Rope Course is estimated to have approximately 60-80 persons using it at any one time. However, these numbers will be evenly distributed across the entire course, thereby reducing the sound build up from multiple persons in the same area.

7.10. The ground between the proposed attraction and the receivers is acoustically classified as soft. However, as the attraction will be located high in the trees, ground attenuation will be significantly reduced. Therefore, ground effects have not been allowed for in this assessment, although in reality a degree of ground absorption would be realised.

7.11. A sound level for a 'shouting' male is variable with frequency and individuals and can range from 82 to 89 dBA. For the purposes of this assessment a level of 89 dB at 1m has been

taken. Children and female 'shouts' would be lower in level, however, male levels have been assessed in this instance to present a worst case.

7.12. Assuming that two males are shouting within close vicinity to each other, a combined level of 92 dBA would be realised. Although additional shouts may occur elsewhere on the Course these would be at a greater distance from the NSRs. It should be noted that such an instantaneous sound as a shout would result in a high instantaneous level, however, this level would be reduced over a longer time period equivalent level, or L_{Aeq}. Again, the source levels assumed in this report present a worst case in this instance.

7.13. The following table outlines the resulting levels taking into account distance corrections to receivers.

Table 7 Operational noise assessment results

Location	Distance to receiver from attraction	Distance correction	Resulting level at receiver dBA	Comply Noise Abatement Order Y/N	Comply BS8233 requirements for outdoor spaces	Comply BS8233 requirements for indoor daytime
Lower Ground Farm, Wootton Lane, north of the proposed attraction.	550m	55 dB	37 dB	Yes, 3 dB below	Yes, comply	Yes, comply
Crump Wood Farm, south of the proposed attraction.	760m	58 dB	34 dB	Yes, 6 dB below	Yes, comply	Yes, comply

7.14. The predicted worst case noise levels comply with the Court Abatement Order and the requirements of BS8233 at both the defined NSRs.

7.15. By way of comparison, resulting noise levels at Lower Ground Farm are predicted to be some 5 dB below measured background levels (37 dBA predicted against 42 dB L_{A90} measured). In accordance with BS4142 this would be of "marginal significance".

7.16. Similarly, by way of comparison, resulting noise levels at Crump Wood Farm are predicted to be some 2 dB above measured background levels (34 dBA predicted against 32 dB L_{A90} measured). In accordance with BS4142 this would be of "marginal significance".

7.17. The above assessment considerers a worst case scenario and impacts would be lower when measured over a defined time period with peaks evened out throughout that time

period. Furthermore, soft ground corrections and shielding from ATR buildings have not been considered in this instance and would reduce the predicted levels further.

8. Mitigation

8.1. This assessment does not predict any adverse impacts, therefore no additional mitigation is required in this instance.

9. Residual Effects

9.1. No residual effects are predicted from the proposed attraction.

10. Conclusions

10.1. This report outlines the assessment and findings relating to a noise assessment for the proposed High Ropes Course, at Alton Towers Resort.

10.2. It is anticipated that construction for the High Ropes Course will begin in February 2015 and be completed by the middle of May 2015. It is intended that the attraction will be open to the general public from the end of May 2015.

10.3. Subject to obtaining the required approved, it is understood that the High Ropes Course will attract between 250-300 people per day during peak times. This number would be reduced during other times of the year, particularly the winter season. It is further estimated that 60-80 persons would be using the course at any one time.

10.4. Baseline noise levels have been provided, based upon assessments for other attractions on the site. These levels have been used for the assessment of noise from construction and operations directly related to the proposed attraction.

10.5. An assessment has been undertaken in relation to potential construction impacts. This relates to both construction traffic and construction activities, throughout the construction duration. Construction traffic is not expected to increase existing noise levels at defined noise sensitive receivers (NSRs). This is due to the existing numbers of cars, coaches / buses and delivery vehicles that currently enter and leave Alton Towers Resort on a daily basis. An assessment of construction activities has also been undertaken, in accordance with BS5228, based upon the assumed construction programme activities. The assessment predicts that there will not be any significant impacts to defined receivers.

10.6. An operational noise assessment has been undertaken based upon potential impacts from operational traffic, building services noise and general visitor noise. Based upon traffic data provided in the transport assessment report, changes in traffic due to the proposed attraction will result in ‘No Change’ to the ambient noise levels.

10.7. Building services noise has been considered. There is no external plant proposed for the attraction, therefore, mechanical and electrical plant has not been considered further.

10.8. Consideration has been given to operational noise from visitor activities. The assessment predicts that sound from operations will comply with the requirements of the Court Abatement Order and BS8233 recommendations.

10.9. Therefore operational noise from the attraction itself will have no impact on receivers.

10.10. No adverse impacts relating to sound from construction and operational activities from the High Ropes Course are predicted.