Memo no:	11739.1A	**Date:**	02/05/24
Project:	Backworth Park Primary School	**Subject:**	Reduced height fence advice note
To:	Rachael Coyne / John Price, North Tyneside Council	**From:**	Compiled by: [redacted] Checked by:

1. Introduction

1.1 Backworth Park Primary School was built in 2017-2018. The school was part of a wider development of a new residential community. In 2017 the neighbouring house developer installed a 2.0-metre-high closeboard fence to the east of their development, forming the western boundary of the school site.

1.2 It is understood that, subsequent to installation of the fence, planning conditions 33 and 35 applied to the school development (application reference 14/01930/FUL) were discharged based upon Apex report ref 6551.3A '*Apex Acoustics Backworth Park Primary School Planning Cond 33 and 35 report*', which referred to a 2.4-metre-high closeboard fence be constructed on the western boundary of the school site.

1.3 It has recently become apparent that the fence installed by the housing developer remains in-situ, and therefore the school development is in breach of the discharged planning conditions.

1.4 Apex have carried out an assessment of the implications of having a 2.0-metre-high fence instead of a 2.4-metre-high fence on the western boundary of the school site with respect to noise impact on residents.

1.5 The original Apex report ref. 6551.3A is appended to this a document for reference.

2. Requirements

2.1 Planning condition 33 requires that a noise mitigation scheme should be provided to address the potential noise impact from the activities arising from the school. Based on the relevant BS 8233[1] and WHO guidelines[2] for external amenity spaces, noise from the school should not exceed 55 dB $L_{Aeq,T}$ in the nearest resident's garden.

2.2 Planning condition 35 requires that the rating level from the mechanical plant shall not exceed the existing background noise level at the boundary of the residential premises when assessed in accordance with BS 4142[3]; the background noise level during the daytime and night-time is 42 dB and 30 dB $L_{A90,T}$ respectively.

[1] BS 8233: 2014, Guidance on sound insulation and noise reduction for buildings
[2] Guidelines for Community Noise, Edited by Birgitta Bergland, Thomas Lindvall, Dietrich H Schwela, World Health Organisation, 1999
[3] BS 4142: 1997, Rating industrial noise affecting mixed residential and industrial areas

3. Assessment

3.1 Assessment of the noise impact has been carried out using the same approach set out in Apex report ref. 6551.3A; noise transmission and propagation is modelled using proprietary software, CadnaA[4], which models noise propagation outdoors according to ISO 9613[5].

3.2 **Planning condition 33 – school activity**

3.3 Based on the possible usage of the playgrounds, three acoustic modelling scenarios are considered:

- Scenario 1: the Reception, Nursery, Key stage 1 and Key stage 2 playgrounds are used at the same time;
- Scenario 2: the Reception, Nursery, MUGA (multi-use games area) and grassed playing field are used at the same time; and
- Scenario 3: the Reception, Nursery and the amphitheatre are used at the same time.

3.4 The results of the school activity noise impact assessment are set out in Table 1.

Scenario	Receptor	Calculated sound level, dB $L_{Aeq,T}$			Criterion	Compliant
		With a 2.4m high fence	With a 2.0m high fence	difference		
1	Most noise effect gardens to rear of dwellings on Willow Grove	41	41	0	55	Yes
	Most noise effect gardens to rear of dwellings on Hotspur North	33	34	+1	55	Yes
2	Most noise effect gardens to rear of dwellings on Willow Grove	48	49	+1	55	Yes
	Most noise effect gardens to rear of dwellings on Hotspur North	42	43	+1	55	Yes
3	Most noise effect gardens to rear of dwellings on Willow Grove	43	43	0	55	Yes
	Most noise effect gardens to rear of dwellings on Hotspur North	38	39	+1	55	Yes

Table 1: Assessment with respect to planning condition 33 – school activity

[4] CadnaA environmental noise modelling software, version 2018, Datakustik GmbH
[5] ISO 9613-2: Acoustics - Attenuation of sound during propagation outdoors

3.5 Planning condition 35 – plant noise

3.6 The mechanical plant includes:

- 1 no. air handling unit (AHU) for kitchen supply
- 1 no. kitchen extract fan
- Condensing units

3.7 When the original mechanical plant noise impact assessment was undertaken, noise data from the condensing unit was unknown. The assessment concluded that either the sound power level of the condensing units should not exceed 76 dB L_{Aw} with a 2.4-metre-high noise barrier forming an enclosure to the condensers, or the sound power levels of the condensing units could not exceed 70 dB L_{Aw} with no noise barrier required. It has been confirmed that Mitsubishi PUHZ-P100VKA condenser units were installed with a sound power level of 70 dB L_{Aw} and no noise barrier was installed, as per the second option.

3.8 During the daytime, all the aforementioned items are taken to operate, potentially simultaneously. During the night-time the kitchen supply AHU and extract fan shall not operate, but the condensing units may operate.

3.9 The results of the school activity noise impact assessment are set out in Table 2.

Period	Receptor	Calculated specific noise level, dB $L_{Aeq,T}$			Criterion	Compliant
		With a 2.4m high fence	With a 2.0m high fence	difference		
Daytime	Most noise effect gardens to rear of dwellings on Willow Grove	36	37	+1	42	Yes
	Most noise effect gardens to rear of dwellings on Hotspur North	33	34	+1	42	Yes
Night-time	Most noise effect gardens to rear of dwellings on Willow Grove	3	3	0	30	Yes
	Most noise effect gardens to rear of dwellings on Hotspur North	0	0	0	30	Yes

Table 2: Assessment with respect to planning condition 35 – plant noise

4. Conclusion

4.1 From the assessment of the impact of school activity and mechanical plant associated with the school with a 2.0-metre-high fence compared to a 2.4-metre-high fence on the western school boundary, it can be seen that the impact, in terms of the sound level and specific noise level, dB $L_{Aeq,T}$, is marginally greater by +1 dB at certain residential premises, but is below the relevant criteria.

4.2 Apex conclude that with a 2.0-metre-high fence on the western boundary, the requirements of planning conditions 33 and 35 have been satisfied.

4.3 It is noted that while a 2.4-metre-high fence on the western boundary was included as part of the mitigation measures set out in Apex report ref. 6551.3A, this came from client proposals and, therefore, was assessed, however, the height of the fence is not critical to meeting the criteria.

Appendix A – Apex report 6551.3A

The following pages contain the appended Apex report ref. 6551.3A *'Apex Acoustics Backworth Park Primary School Planning Cond 33 and 35 report'*.

Backworth Park Primary School

Acoustic report for Planning Condition no. 33 and 35

6551.3

30th April 2018

Revision A

Backworth Park Primary School

Acoustic report for Planning Condition no. 33 and 35

6551.3A

Revision	Description	Issued by	Date
A	First issue	WW	30th April 18

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2 Summary

2.1 This report has been prepared in response to Planning Condition no. 33 and 35 of Planning Application 14/01930/FUL for the development of Backworth Park Primary School.

2.2 Condition 33 and 35 requires that a noise mitigation scheme shall be provided so that the noise impact from the school does not exceed set limits.

2.3 A noise mitigation scheme has been proposed with details shown in Section 11.

2.4 **Condition no. 33**

2.5 Condition 33 requires that a noise mitigation scheme should be provided to address the potential noise impact from the activities arising from the school.

2.6 Based on the relevant BS 8233 and WHO guidelines for external amenity spaces, it is proposed that the noise from the school should not exceed 55 dB $L_{Aeq,T}$ at the nearest resident's garden.

2.7 The sound levels from the proposed playgrounds have been calculated based on the number of classrooms and the "shout" voice in accordance with BS EN ISO 9921.

2.8 With the proposed noise mitigation measures, the calculated highest noise level at the resident's garden is 44 dB $L_{Aeq,T}$. This is more than 11 dB below the proposed upper limit for external amenity spaces.

2.9 Therefore, the Planning Condition no. 33 is calculated to be achieved.

2.10 **Condition no. 35**

2.11 Condition 35 requires that the rating level from the proposed plant shall not exceed the existing background noise level at the boundary of the residential premises when assessed in accordance with BS 4142.

2.12 The existing noise environment has been measured and the typical background noise level during the daytime and night time is 42 dB and 30 dB $L_{A90,T}$ respectively.

2.13 With the proposed mitigation measures, the calculated rating levels during the daytime and night time are 36 and 26 dB $L_{Ar,Tr}$ respectively, no greater than the existing background noise level.

2.14 Therefore, the Planning Condition no. 35 is calculated to be achieved.

3 Introduction

3.1 A new primary school, Backworth Park Primary School has been proposed at Backworth, North Tyneside. The location of the school and nearby residential dwellings are shown in Figure 1 which is based on the architectural layout, Reference 1.

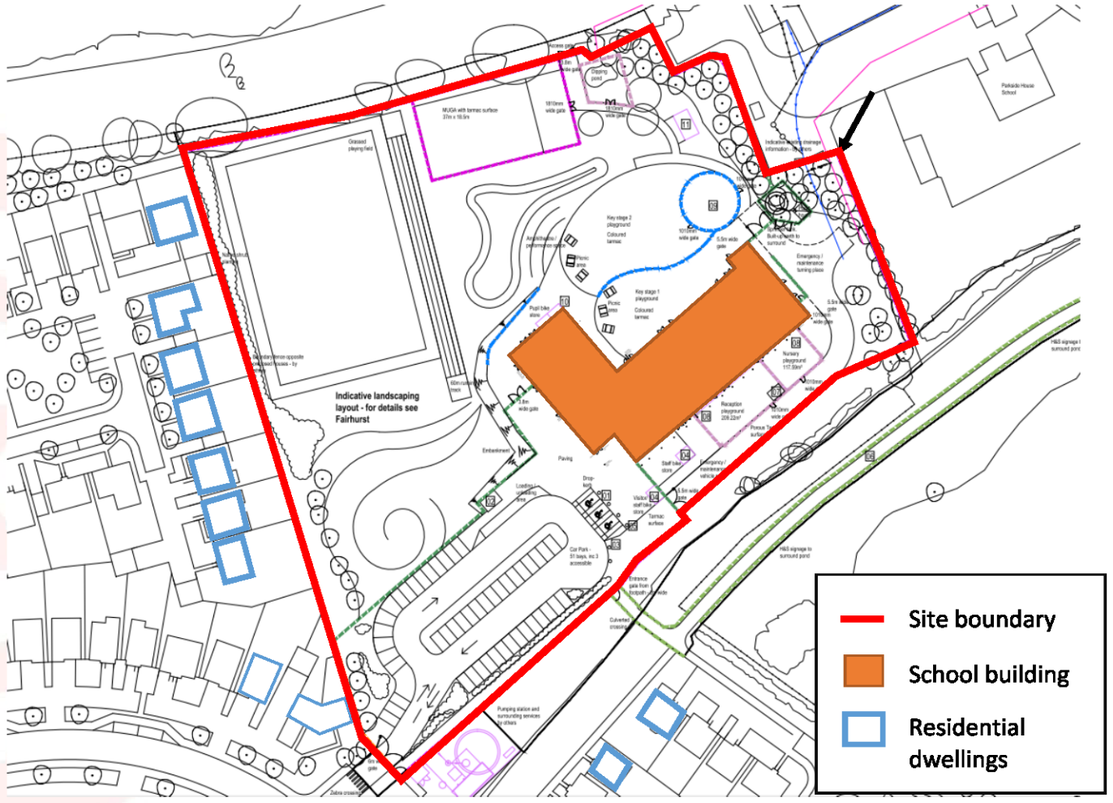


Figure 1: Proposed school and nearby residential premises

3.2 Apex Acoustics has been appointed to undertake an assessment of the potential noise impact from the new school to discharge the Planning Conditions.

3.3 This report introduces the detail assessment of the noise impact from the proposed playground and mechanical plant.

4 Planning Condition no. 33 and 35

4.1 A screen shot of the Planning Condition no. 33 and 35 associated with Application reference 14/01930/FUL for this development is shown in Figure 2.

33	Prior to the commencement of development of the school, a noise mitigation scheme to address potential noise from plant or activities arising from the school shall be submitted to and approved in writing by the LPA. The approved noise mitigation scheme shall be implemented in accordance with the approved details prior to first occupation of the school. (Amended)
35	Prior to the installation of plant or equipment at the school, a noise scheme must be submitted to and approved in writing by the LPA. The noise scheme must be submitted in accordance with BS4142:1997 to determine the background noise level without the plant noise operating at the boundary of the nearest residential premises and appropriate mitigation measures taken where necessary to ensure the rating level of plant any equipment does not exceed the background noise. The mitigation measures shall be implemented in accordance with the approved details prior to first occupation of the school. (No change)

Figure 2: Screenshot of Planning Condition no. 33 and 35

5 Guidance to assess playground noise

5.1 There are no current guidelines or standards which relate to the assessment of noise impact of children playing within the bounds of a school site, whether or not the school is existing or a new development.

5.2 The most relevant guidelines are reviewed to propose a reasonable criterion for the assessment of the noise from the activities of the school.

5.3 **BS 8233**

5.4 BS 8233:2014, Reference 3, states the following with respect to a design criterion for external noise:

For traditional external areas that are used for amenity space, such as gardens and patios it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline values of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments.

5.5 **WHO**

5.6 WHO's Guidelines for Community Noise, Reference 4, advises that noise level in the outdoor living area should not exceed 55 dB $L_{Aeq,16hour}$ otherwise critical health effects or serious annoyance may occur.

5.7 Hence it is proposed that noise levels from the playground at the boundary to residential properties not exceeding 55 dB $L_{Aeq,T}$ may be acceptable to the Local Authority for Planning Condition 33.

6 Guidance to assess plant noise

6.1 BS 4142:1997, Reference 2, requires a rating level to be calculated based on the character of the specific noise.

6.2 The rating level is calculated by adding a character correction to the specific noise.

6.3 BS 4142 states that "apply a 5 dB correction if one or more of the following features occur, or are expected to be present for new 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."

7 Existing noise environment

7.1 The existing background noise level was measured previously by others in 2015, Reference 5. The measured background noise levels at the closest houses are reproduced as shown in Table 1.

Time	Parameter
Daytime	42 dB $L_{A90,T}$
Night time	30 dB $L_{A90,T}$

Table 1: Measured background noise levels during daytime and night time

8 Playground noise levels

8.1 According to the architectural drawings, there are:

- 1 no. Reception playground
- 1 no. Nursery playground
- 1 no. Key stage 1 playground
- 1 no. Key stage 2 playground
- 1 no. MUGA
- 1 no. Grassed playing field
- 1 no. Amphitheatre

8.2 Vocal effort for a male speaker are defined in Table A.1 in BS EN ISO 9921, Reference 6, as shown in Table 2.

Vocal effort	$L_{s, A, 1m}$
Very loud	78
Loud	72
Raised	66
Normal	60
Relaxed	54

Table 2: Vocal effort of a male speaker and related A-weighted speech level at 1m in front of mouth

8.3 To determine the sound power level for vocal effort the following equation has been used:

$$L_w = L_S + 20 * \log_{10}(r) + 11$$

where r is the distance from the speaker and $L_{s,A}$. is the vocal effort

8.4 On this basis the sound power level for a 'loud' vocal effort is calculated to be 83 dB(A) L_w.

8.5 It is assumed for the purpose of the assessment that one child in each classroom group could simultaneously and continuously have a 'loud' vocal effort within the playground.

8.6 This is considered a very prudent assumption as it is very unlikely that a child could generate the noise level of a male speaker or that this level could occur from a few children simultaneously.

8.7 To determine the sound power level for multiple children the following equation has been used:

$$L_{w, n\ children} = 83 + 10\log_{10}(n)$$

where n is equal to the number of children

8.8 In this report, n is determined by the number of classrooms. According to the architectural drawings, Reference 1, the number of classrooms are counted and the sound power levels of each playground are calculated as shown in Table 3.

8.9 It is assumed that when there is a performance in the amphitheatre maximum 6 no. of students using "loud" voice to sing. The corresponding sound power level of the noise from the amphitheatre is also shown in Table 3.

Room	Number	Calculated sound power level in the playground
Reception	2	86 dB L_{Aw} for Reception playground
Nursery	1	83 dB L_{Aw} for Nursery playground
Key stage 1 classrooms	3	88 dB L_{Aw} playground used for key stage 1 students
Key stage 2 classrooms	6	91 dB L_{Aw} playground used for key stage 2 students
Amphitheatre	6	91 dB L_{Aw}

Table 3: Number of classrooms and the calculated sound power level in the corresponding playground

8.10 The distribution of the children is determined by the architectural drawings, which classifies the playgrounds for different age groups.

9 Plant noise levels

9.1 **Proposed plant and associated noise levels**

9.2 The proposed plant includes:

- 1 no. air handling unit (AHU) for kitchen supply
- 1 no. kitchen extract fan
- Condensing units

9.3 The location of all the units have been taken from the mechanical engineers' drawings, Reference 7.

9.4 The manufacturer and model of the AHU and extract fan are provided by the client as shown in Table 4.

Plant	Manufacturer	Reference or model	No. proposed
Air handling unit (AHU)	Barkell	Reference BK048553/W	1
Extract fan	Vent-Axia	Model EKF560E3	1

Table 4: Proposed plant

9.5 Manufacturer supplied noise levels are shown in Table 5.

Plant	Data type	dB(A)	Single-octave band centre frequency (Hz) Linear sound power levels (dB)						
			63	125	250	500	1k	2k	4k
AHU	L_w	70	61	58	72	66	66	61	58
Extract fan	L_w	83	82	87	87	81	73	70	67

Table 5: Manufacturers noise levels

9.6 If plant emitting higher noise levels than those accounted for in this report is proposed, or additional plant also proposed, the impact should be reassessed to check compliance with the Planning Condition limits.

10 Calculation of noise propagation

10.1 **Scenarios for playground noise**

10.2 The MUGA and Grassed playing field are located close to the Key stage 1 and 2 playgrounds and they are likely to be used by the students older than reception age.

10.3 Based on the possible usage of the playgrounds, three acoustic modelling scenarios are considered:

- Scenario 1: the Reception, Nursery, Key stage 1 and Key stage 2 playgrounds are used at the same time;
- Scenario 2: the Reception, Nursery, MUGA and Grassed playing field are used at the same time; and
- Scenario 3: the Reception, Nursery and the amphitheatre are used at the same time.

10.4 **Operation times of the plant**

10.5 The air handling unit and kitchen extract fan are likely to operate during the school hours (daytime) only.

10.6 The condensing unit(s) are likely to operate 24 hours per day to prevent overheating to the IT equipment.

10.7 The air handling unit and kitchen extract fan are assumed to operate continuously during the daytime 1-hour daytime assessment period.

10.8 The condensing unit(s) may operate intermittently depending on the temperature.

10.9 **Acoustic modelling**

10.10 Noise transmission and propagation is modelled using proprietary software, CadnaA, Reference 8. This models noise propagation outdoors according to ISO 9613, Reference 9.

10.11 The "Grassed playing field" is covered by soft grassland, hence loss due to ground absorption is accounted for by the use of a ground factor, G, of 1.

10.12 Other playgrounds are understood to have hard surface, hence loss due to ground absorption is accounted for by the use of a ground factor, G, of 0.

10.13 Details of the simulation settings are shown in in Table 7.

Parameters	Value	Comments
Software	Cadna/A	Version 2018
Propagation model	ISO 9613-2	
Number of reflections	3	Apex method
Façade absorption	1 dB / reflection	Façades considered to be smooth as a prudent assumption
Ground absorption	G=0 and 1	0 for hard ground, 1 for soft ground
Sound sources	$83+10\log_{10}(n)$	n is the number of children

Table 6: Used parameters in the acoustic modelling

10.14 2D views of the CadnaA models for the playground sources and plant sources are shown in Figure 3 and Figure 4.

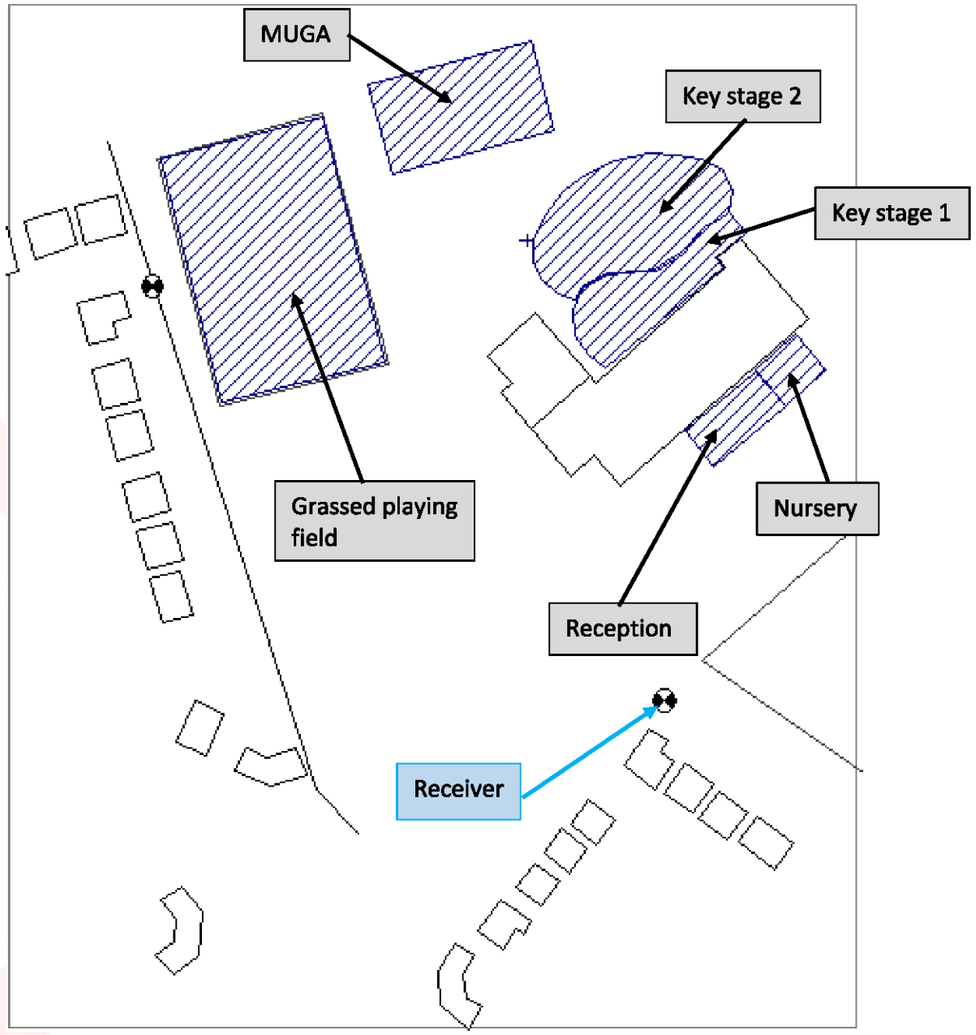


Figure 3: Acoustic model for the playground sources

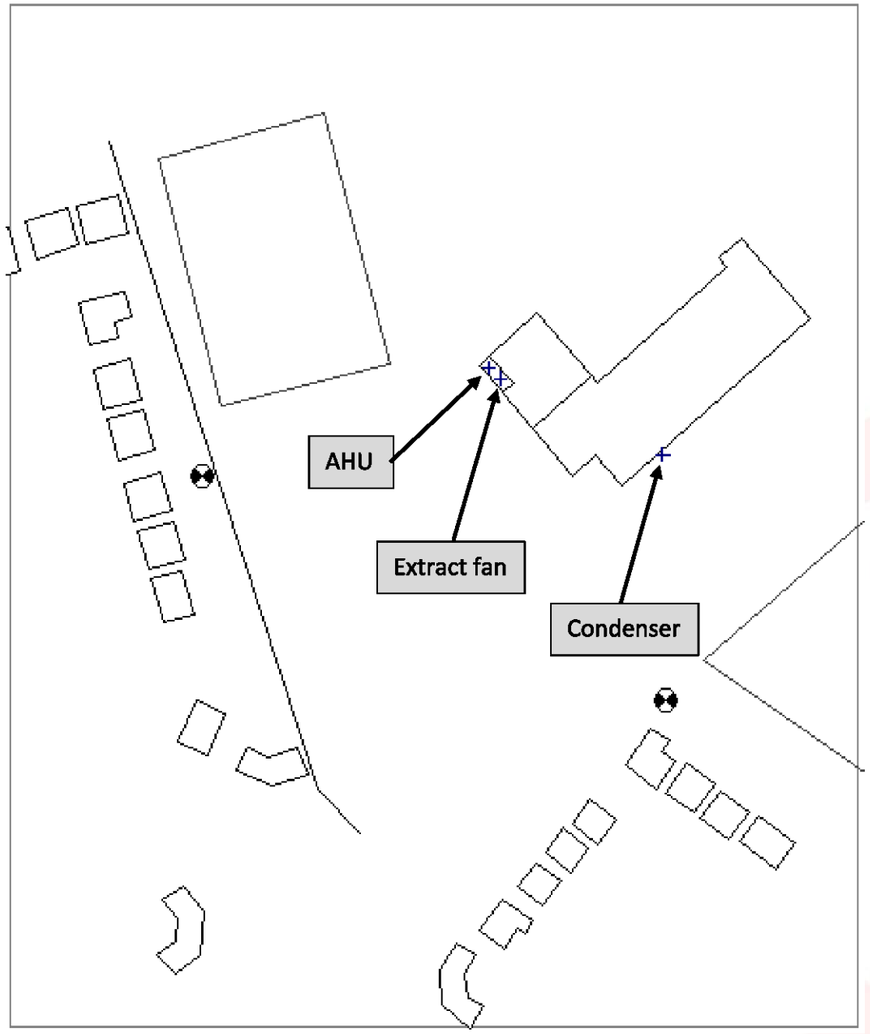


Figure 4: Acoustic model for the plant sources

10.15 Two receivers at a height of 1.5 m, indicated by black and white circles in the figures, have been placed on the site boundary of the nearest residential properties to the West and South of the proposed school.

10.16 Surface sources indicated by a blue square in the figures covering the area of the playground, at a height of 1.0 m and 0.5 m for students above and below reception age respectively, are used to model the children using the playground.

11 Mitigation measures

11.1 Minimum 2.4 m high acoustic timber fence along the west boundary of the school and timber fence around the air handling unit has been proposed by the client.

11.2 As the noise data from the condensing unit is unknown, it is not possible to quantify whether the current proposal meets the requirements of the planning condition.

11.3 The overall mitigation scheme is proposed as:

- ≥ 2.4 m high noise barrier along the west boundary of the school;
- ≥ 2.4 m high noise barrier around the air handling unit; and
- Option 1, total sound power levels of all the condensing units ≤ 76 dB L_{Aw} and a 2.4 m high noise barrier; option 2, total sound power levels of all the condensing units ≤ 70 dB L_{Aw} without noise barriers.

11.4 The locations of the noise barriers are shown in Figure 5.

11.5 To be effective in practice, a barrier should have no cracks or gaps, be continuous to the ground, and have a surface density of at least 10 kg/m2, such as a timber fence with overlapping boards.

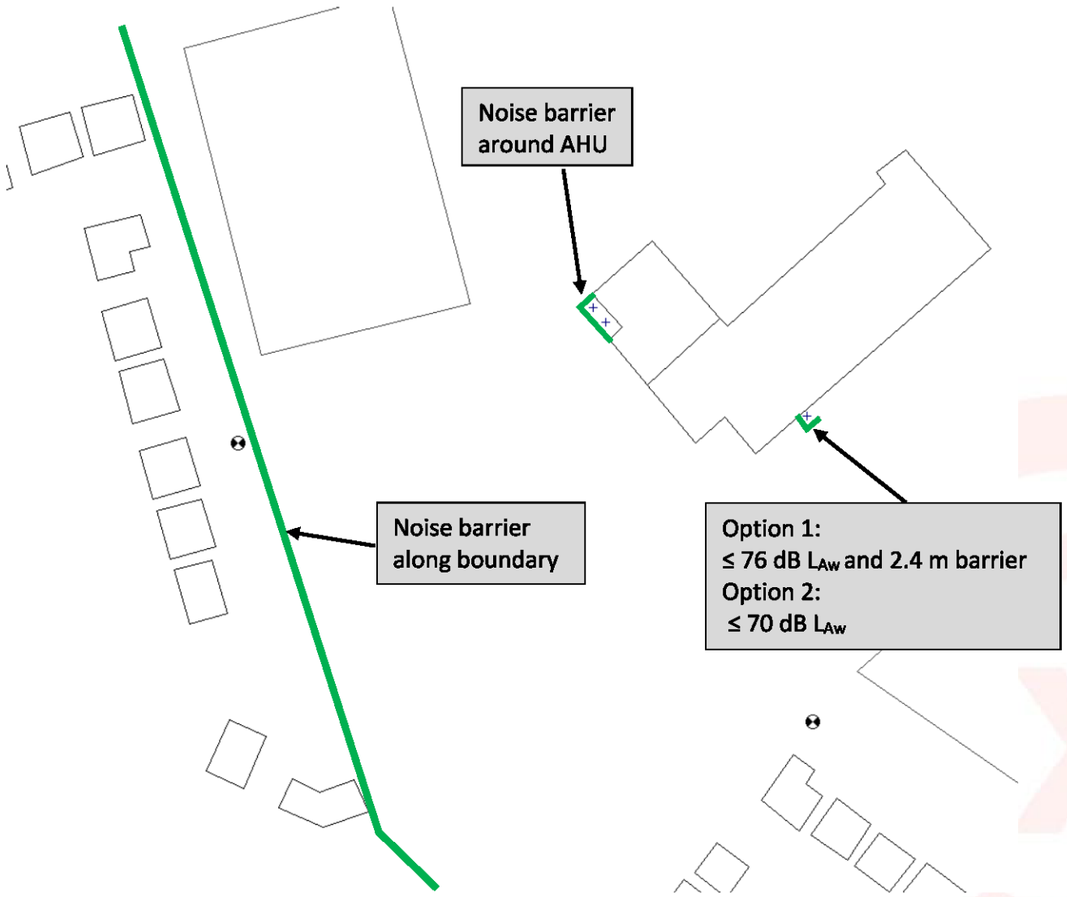


Figure 5: Mitigation measures

12 Calculated noise levels

12.1 Playground noise

12.2 With the noise mitigation measures detailed in Section 11, the sound levels at the nearest residential properties located to the West and South the proposed school are calculated. The results are shown in Table 8. The calculated specific noise level contours for different scenarios are shown in Figure 6, Figure 7 and Figure 8 in Appendix 1.

Receiver Location	Calculated sound level, $L_{Aeq,T}$ / dB		
	Scenario 1	Scenario 2	Scenario 3
Residential West	38	44	40
Residential South	41	42	41

Table 7: Calculated playground noise levels at the boundary of the residential properties

12.3 Specific noise level from the plant

12.4 With the noise mitigation measures detailed in Section 11 , the calculated specific noise levels from the plant during the daytime and night time assessment periods are shown in Table 8. The calculated specific noise level contours for daytime and night time are shown in Figure 9 and Figure 10 respectively in Appendix 1.

Assessment time periods	Receiver Location	Calculated specific noise level, $L_{Aeq,T}$ / dB			
		Extract fan	AHU	Condensing unit(s)	Total specific noise level
Daytime	Residential West	36	13	6	36
	Residential South	26	15	26	29
Night time	Residential West	-	-	6	6
	Residential South	-	-	26	26

Table 8: Calculated specific noise levels boundary of the residential properties

13 Noise impact assessments

13.1 Playground noise

13.2 The calculated highest noise level from the playgrounds at the boundary of the residential premises is 44 dB $L_{Aeq,T}$. This is 11 dB below the WHO guideline for outdoor living area and 6 dB below the desired external noise levels for amenity space suggested in BS 8233.

13.3 Therefore, it is considered that the noise from activities arising from the school satisfy the requirements of Planning Condition no. 33 based on the proposed noise mitigation scheme.

13.4 Plant noise

13.5 The noise impact from the plant is assessed in accordance with BS 4142 based on the calculated specific noise level and potential penalties due to sound characters.

13.6 The details for daytime and night time assessments for the residential premises to the South and West are shown in Table 9 and Table 10 respectively.

Parameters	Daytime assessment	Night time assessment	Commentary
Measured background noise level, dB $L_{A90,T}$	42	30	-
Specific noise level, dB $L_{Aeq,T}$	29	26	-
Sound character penalties, dB	0	0	The noise from the condensers is so low that the intermittency is unlikely to be perceived. Therefore, no penalty is applied to the specific noise level.
Rating level, dB $L_{Ar,Tr}$	29	26	-
Excess of rating level over background	-13	-4	Requirements of Planning condition 35 is calculated to be achieved.

Table 9: BS 4142 assessment for noise at the boundary of the residential premise to the South

Parameters	Daytime assessment	Night time assessment	Commentary
Measured background noise level, dB $L_{A90,T}$	42	30	-
Specific noise level, dB $L_{Aeq,T}$	36	6	-
Sound character penalties, dB	0	0	The AHU and extract fan are considered as broadband noise without any features attracting penalties. The noise from the condensers is so low that the intermittency is unlikely to be perceived. Therefore, no penalty is applied to the specific noise level.
Rating level, dB $L_{Ar,Tr}$	36	6	-
Excess of rating level over background	-6	-24	Requirements of Planning condition 35 is calculated to be achieved.

Table 10: BS 4142 assessment for noise at the boundary of the residential premise to the West

13.7 Uncertainty in the calculated impact has been reduced by the use of a calculation method in accordance with ISO 9613-2.

13.8 The calculated rating level during daytime is far below the measured background noise level, therefore, the uncertainty due to daytime measurement is unlikely change the assessment output.

13.9 The night time background measurement was carried out between 02:00 and 03:00 hours in the early morning when is considered to be the quietest period of the night. The rating level is likely to be more below the background during other periods of the night time.

13.10 Therefore, the requirement of Planning Condition 35 is calculated to be achieved.

14 Conclusion

14.1 The noise from using the proposed playground and plant is calculated.

14.2 Noise mitigation measures are required to minimise the potential for adverse impacts, to satisfy the Planning Condition limits.

14.3 Based on the mitigation measures detailed in Section 11, the calculated noise level from the playground at the boundary of the residential premises is 44 dB $L_{Aeq,T}$, 11 dB below the proposed criteria.

14.4 The calculated BS 4142 rating levels during day and night time at the boundaries of the nearest residential premises are below the measured background level.

14.5 Therefore, requirements of Planning Condition 33 and 35 are considered to be satisfied.

15 References

1 Proposed Site Plan, drawing no. 81400 G2 SI-010 I, B3 Architects, April 2015; GF Partition Setting Out, drawing no. 81400 G2-GA-128a, B3 Architects, January 2018.

2 BS 4142: 1997, Rating industrial noise affecting mixed residential and industrial areas.

3 BS 8233: 2014, Guidance on sound insulation and noise reduction for buildings.

4 Guidelines for Community Noise, Edited by Birgitta Bergland, Thomas Lindvall, Dietrich H Schwela, World Health Organisation, 1999.

5 NOISE DESIGN OF A NEW BUILD PRIMARY SCHOOL (Building Bulletin 93) Acoustic Inclusions within Design at BACKWORTH PARK, BACKOWORTH, NORTH TYNESIDE.

6 BS EN ISO 9921:2003 Ergonomics - Assessment of speech communication.

7 Mechanical ENGINEERING SERVICES PROPOSED MECHANICAL SERVICES EXTERNAL SERVICES LAYTOUT, drawing no. 1155-M-015, Revision C3, Malone.

8 CadnaA environmental noise modelling software, version 2018, Datakustik GmbH.

9 ISO 9613-2: Acoustics - Attenuation of sound during propagation outdoors.

16 Appendix 1: Specific noise level contours

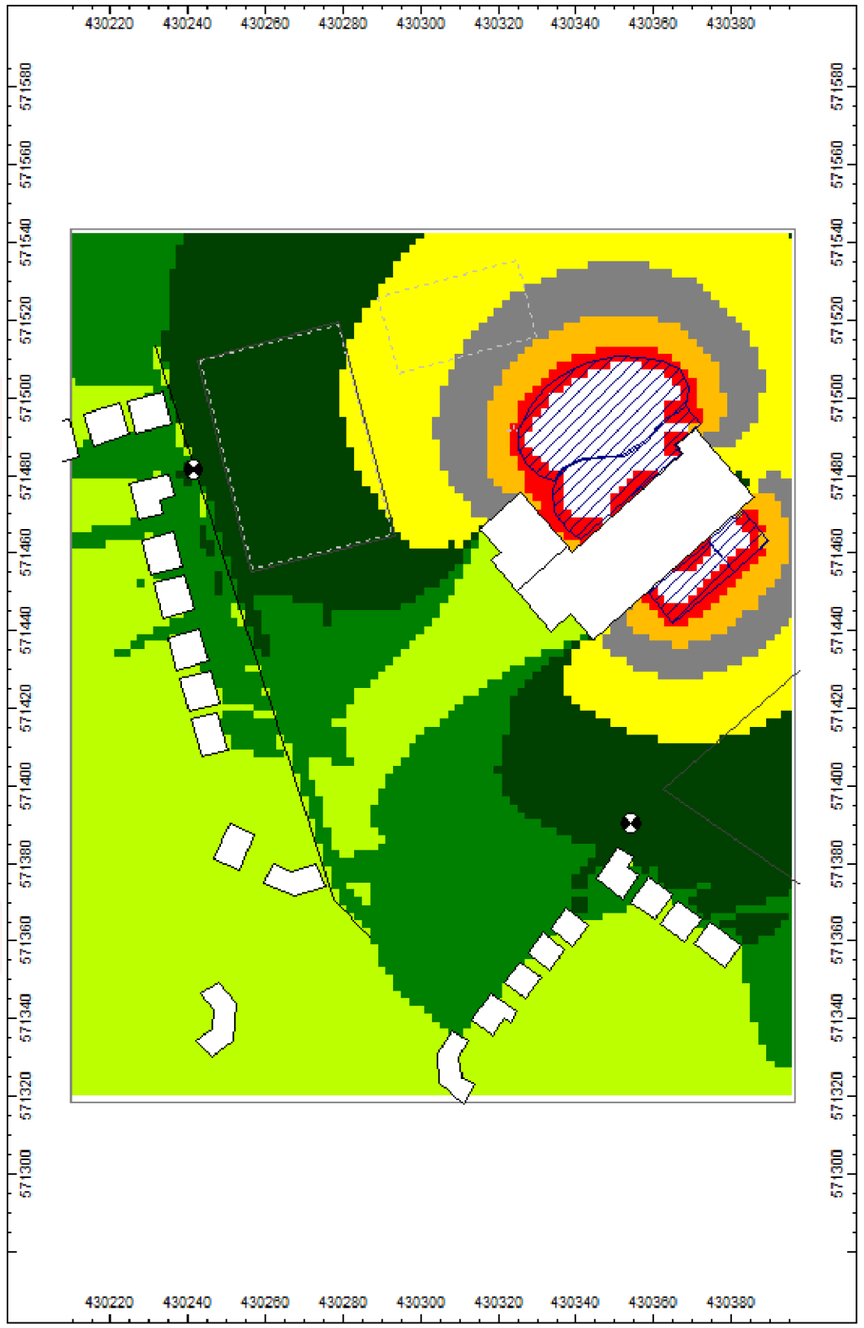


Figure 6: Specific noise level contour at 1.5 m high for playground noise – scenario 1

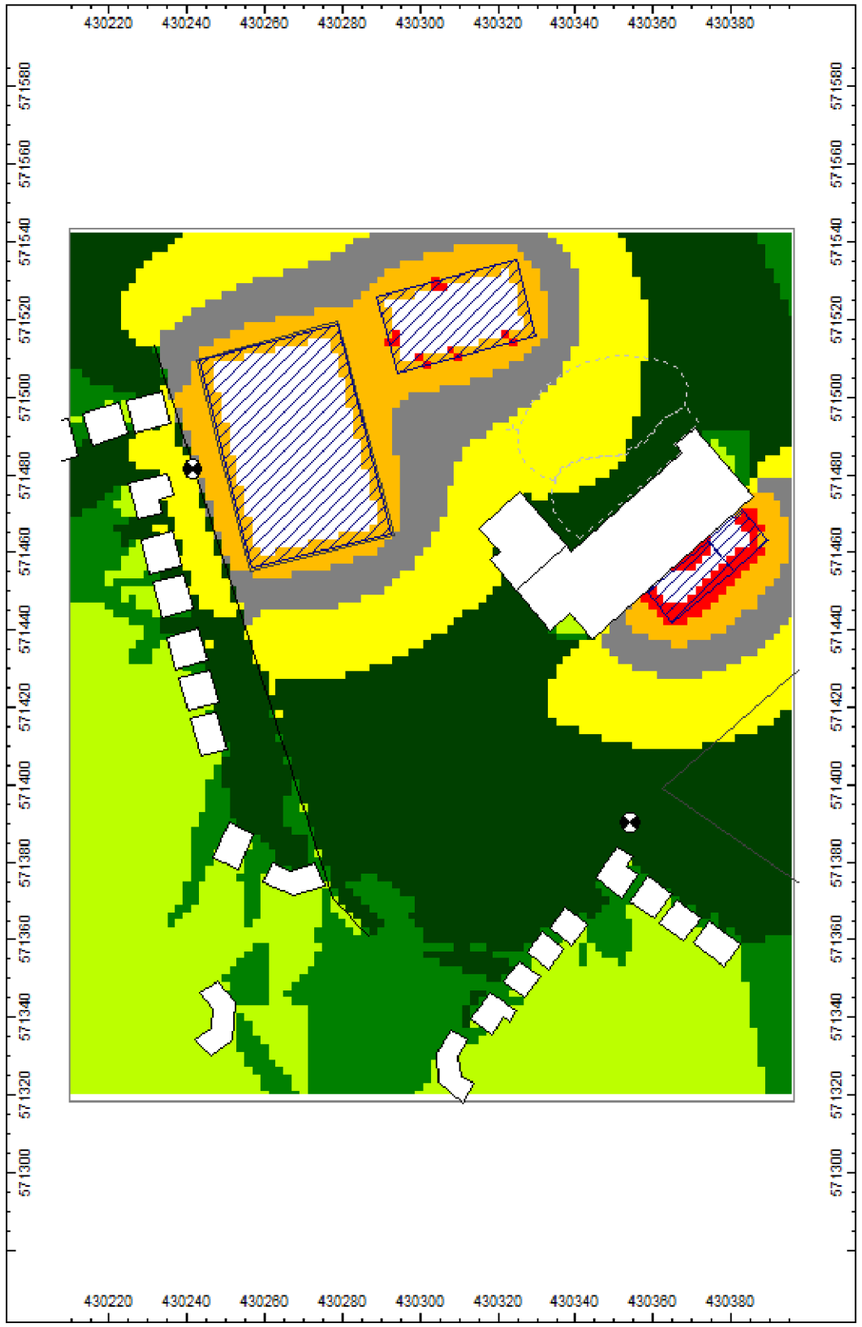


Figure 7: Specific noise level contour at 1.5 m high for playground noise – scenario 2

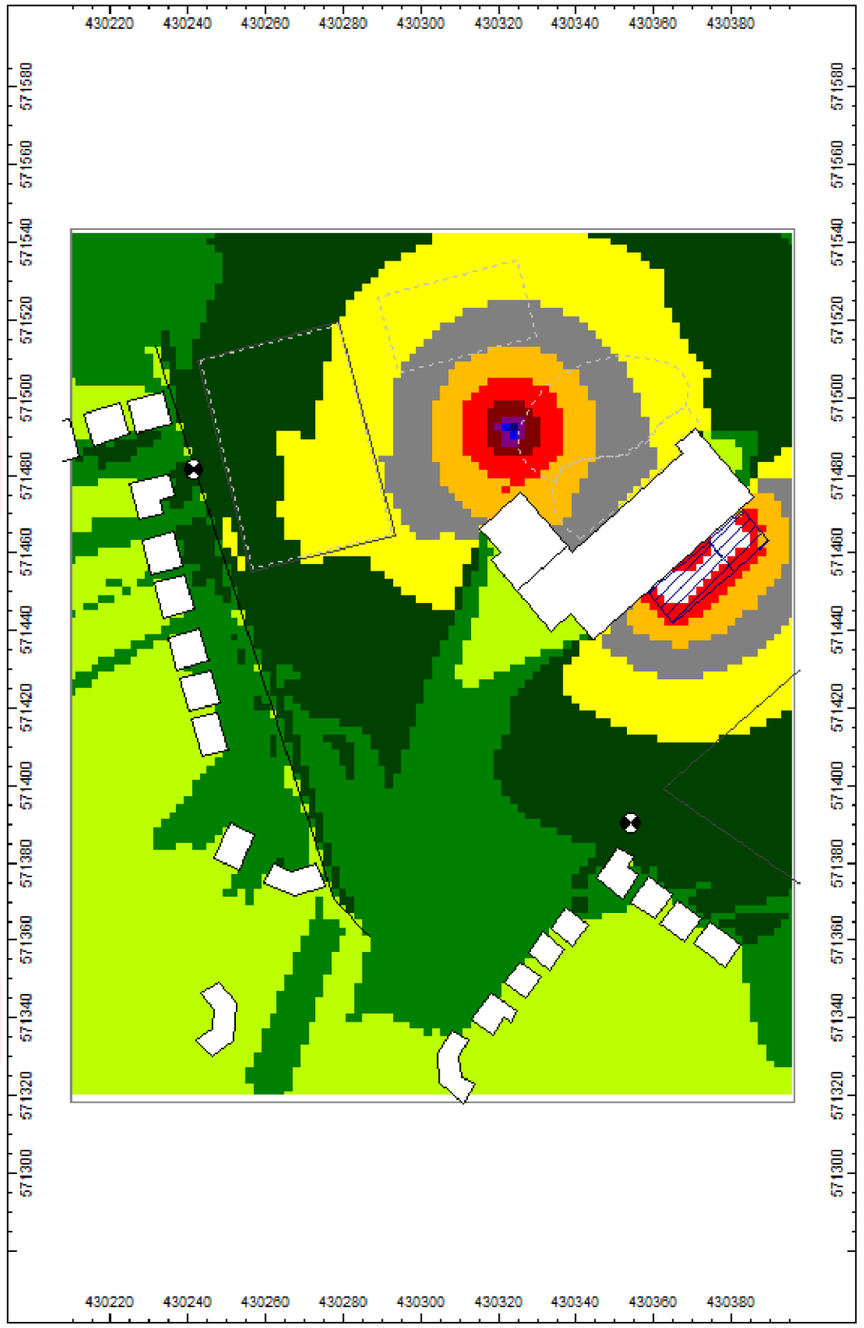


Figure 8: Specific noise level contour at 1.5 m high for playground noise – scenario 3

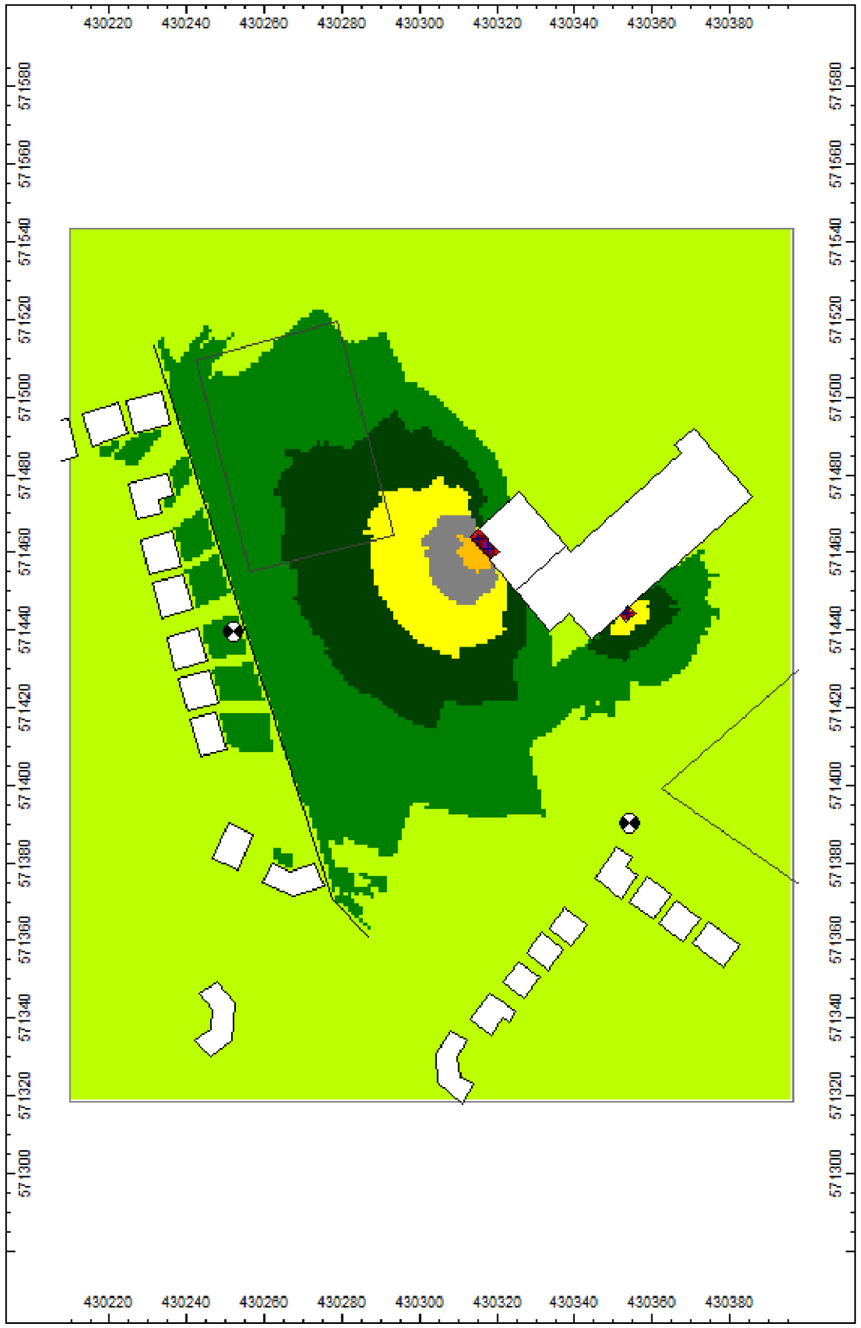


Figure 9: Specific noise level contour at 1.5 m high for plant noise – daytime

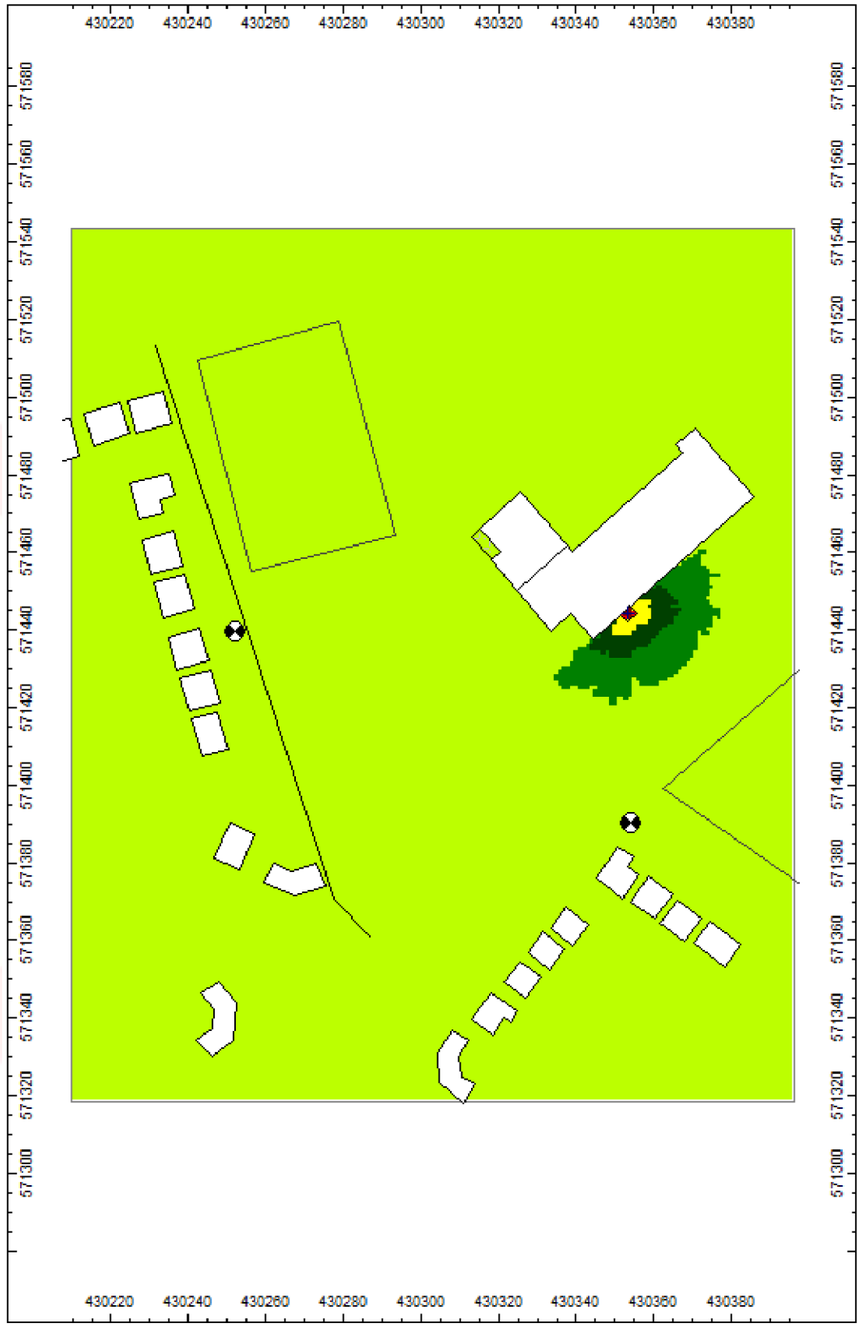


Figure 10: Specific noise level contour at 1.5 m high for plant noise – night time