

---

## Noise Impact Assessment

Extended Operating Hours – NYPC, Darlington

**Client:** North Yorkshire Polymer Compounds

**Reference:** 21.089.1.R1

**Issue Date:** 22 June 2021



Reference: 21.089.1.R1  
Date: 22 June 2021  
Project: Extended Operating Hours – NYPC, Darlington

---

Report Version	1	2	3	4
Prepared by	John Goodwin MIOA			
Position	Acoustic Consultant			
Reviewed by	Martyn Parker AMIOA			
Position	Senior Consultant			
Issue Date	22 June 2021			
Comments	-			

---

Professional Consult Limited

[hello@professionalconsult.co.uk](mailto:hello@professionalconsult.co.uk)

07704 672683

[www.professionalconsult.co.uk](http://www.professionalconsult.co.uk)

This report has been prepared by Professional Consult Limited in accordance with the agreed terms and conditions of the appointment. Professional Consult Limited cannot accept any responsibility for use of, or reliance on, the contents of this report by any third party.

Professional Consult Limited is registered in England (11635570). Registered Office: 534 Edenfield Road, Rochdale, Lancashire OL12 7QJ

## EXECUTIVE SUMMARY

This Assessment has been undertaken to identify the key sources of noise associated with operation of the Site which may adversely impact upon existing residential amenity. Accordingly, this Assessment has been completed with due regard to the National Planning Policy Framework and its associated National Planning Policy Guidance in addition to appropriate British Standards and guidance documents relevant to the assessment of noise impacts.

This Assessment has relied upon a background sound survey completed in a location considered to be representative of the sound climate at the closest residential dwellings to the Site. This Assessment has also relied upon a series of on-Site source noise measurements taken for all mechanical and electrical plant which will operate over the extended operating times.

For the daytime period, the Assessment has shown that the rated level of noise falls below the criteria noise level for all residential dwellings and BS4142:2014+A1:2019 provides the following advice for this outcome:

*'Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.'*

For the night-time period, the Assessment has shown that the rated level of noise within bedrooms falls below the internal target noise criteria for sleep disturbance.

The predicted noise levels at the surrounding receptors from proposed operations at the Site are considered to be sufficiently low enough to afford compliance with the 'No Observed Adverse Effect Level' as detailed in the PPG and as such noise should not be deemed to be a determining factor in the granting of planning permission for this Site.

---

## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION</b>	<b>5</b>
<b>2</b>	<b>POLICY &amp; GUIDANCE</b>	<b>6</b>
<b>3</b>	<b>NOISE SURVEYS</b>	<b>11</b>
<b>4</b>	<b>NOISE IMPACT ASSESSMENT</b>	<b>13</b>
<b>5</b>	<b>CONCLUSION</b>	<b>18</b>
<b>APPENDIX 1:</b>	<b>LIMITATIONS</b>	<b>19</b>
<b>APPENDIX 2:</b>	<b>GLOSSARY OF ACOUSTIC TERMINOLOGY</b>	<b>20</b>
<b>APPENDIX 3:</b>	<b>BACKGROUND SOUND MEASUREMENT LOCATION</b>	<b>22</b>
<b>APPENDIX 4:</b>	<b>CADNA-A GRID NOISE MAP – DAYTIME</b>	<b>23</b>
<b>APPENDIX 5:</b>	<b>CADNA-A GRID NOISE MAP – NIGHT-TIME</b>	<b>24</b>
<b>APPENDIX 6:</b>	<b>CADNA-A GRID NOISE MAP – 3D MODELS</b>	<b>25</b>
<b>APPENDIX 7:</b>	<b>MEASURED BACKGROUND SOUND LEVELS</b>	<b>26</b>

## **1 INTRODUCTION**

### **1.1 Appointment**

1.1.1 Professional Consult Limited was instructed by Prism Planning on behalf of North Yorkshire Polymer Compounds (NYPC) to prepare a Noise Impact Assessment ('the Assessment') for the proposed extension to operating hours at NYPC located at 15 Banks Road in Darlington DL1 1AT to be referred to hereafter 'the Site'.

### **1.2 The Proposal**

1.2.1 The Site currently operates between 06:00 – 18:00 Monday to Friday and it is understood that proposal seek to extend these operating hours over a full 24-hr period from Monday to Friday.

### **1.3 Site & Locality**

1.3.1 The Site is located in a commercial area and the sound climate in the locality of the Site comprises of various commercial process noise and noise from vehicles using the local road network.

1.3.2 The Site comprises of two main buildings; a Process Building where plastic material is handled and a Finished Goods Building where processed material is stored. Externally there is a Generator located between the two buildings and there are occasional Fork Lift Truck movements between the two buildings and across the Site.

1.3.3 The closest residential dwellings to the Site lie to the south off The Broadway, to the east off Gibb Avenue and Spindle Grove and to the north east off Roker Close.

### **1.4 Purpose of Assessment**

1.4.1 This Assessment has been undertaken to identify the key sources of noise associated with operation of the Site which may adversely impact upon existing residential amenity. Accordingly, this Assessment has been completed with due regard to the National Planning Policy Framework and its associated National Planning Policy Guidance in addition to appropriate British Standards and guidance documents relevant to the assessment of noise impacts.

1.4.2 This Assessment has relied upon a background sound survey completed in a location considered to be representative of the sound climate at the closest residential dwellings to the Site. This Assessment has also relied upon a series of on-Site source noise measurements taken for all mechanical and electrical plant which will operate over the extended operating times.

1.4.3 All acronyms used within this report are defined in the Glossary presented in Appendix 2.

### **1.5 Limitations**

1.5.1 The limitations of this report are presented in Appendix 1.

### **1.6 Confidentiality**

1.6.1 Professional Consult has prepared this report solely for the use of the Client. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Professional Consult; a charge may be levied against such approval.

## 2 POLICY & GUIDANCE

### 2.1 National Planning Policy Framework & National Planning Practice Guidance

- 2.1.1 The Government updated the National Planning Policy Framework (NPPF) on 19<sup>th</sup> February 2019 and its associated National Planning Practice Guidance (NPPG) on 22<sup>nd</sup> July 2019. Together, the NPPF and NPPG set out what the Government expects of local authorities. The overall aim is to ensure the planning system allows land to be used for new homes and jobs, while protecting valuable natural and historic environments.
- 2.1.2 The NPPG adds further context to the NPPF and it is intended that the two documents should be read together.
- 2.1.3 Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.
- 2.1.4 Local planning authorities' plan-making and decision making should take account of the acoustic environment and in doing so consider:
- ② Whether or not a significant adverse effect is occurring or likely to occur;
  - ② Whether or not an adverse effect is occurring or likely to occur; and
  - ② Whether or not a good standard of amenity can be achieved.
- 2.1.5 In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.
- 2.1.6 The Observed Effect Levels are as follows:
- ② Significant observed adverse effect level: This is the level of noise exposure above which significant adverse effects on health and quality of life occur;
  - ② Lowest observed adverse effect level: this is the level of noise exposure above which adverse effects on health and quality of life can be detected; and
  - ② No observed effect level: this is the level of noise exposure below which no effect at all on health or quality of life can be detected.
- 2.1.7 Table 1 summarises the noise exposure hierarchy, based on the likely average response.

**Table 1. Noise Exposure Hierarchy**

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not Noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
<i>Lowest Observed Adverse Effect Level</i>			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
<i>Significant Observed Adverse Effect Level</i>			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

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

2.1.9 These factors include:

- ② The source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day - this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night;
- ② For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise;
- ② the spectral content of the noise and the general character of the noise. The local topology and topography should also be taken into account along with the existing and, where appropriate, the planned character of the area.

2.1.10 More specific factors to consider when relevant:

- ② where applicable, the cumulative impacts of more than one source should be taken into account along with the extent to which the source of noise is intermittent and of limited duration;
- ② Consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on

windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations; and

- ② If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.

## 2.2 BS4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

2.2.1 This standard describes methods for rating and assessing sound of an industrial or commercial nature which includes:

- ② Sound from industrial and manufacturing processes;
- ② Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- ② Sound from the loading and unloading of goods and materials at industrial and / or commercial premises; and,
- ② Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from processes or premises, such as that from forklift trucks, or that from train or ship movements on or around an industrial or commercial Site.

2.2.2 The procedure detailed in the standard compares the measured or predicted noise level 'the specific noise level' from any of the above detailed noise sources with the background sound level at a residential dwelling. The measured background sound level at a receptor should be reliable and should not necessarily ascertain a lowest measured background sound level, but rather to quantify what is 'typical.'

2.2.3 The specific noise level also acknowledges the following reference time intervals depending upon whether the noise source operates during daytime or night-time periods:

- ② Daytime (07:00 - 23:00): 1 hour; and
- ② Night-time (23:00 - 07:00): 15 minutes.

2.2.4 There are a number of 'penalties' which can be attributed to the specific sound level, either subjectively or objectively, depending upon the 'acoustic features' of the sound level under investigation as follows. These penalties vary in their weighting depending upon the severity of the acoustic feature, as follows (with regards to the subject method):

### Tonality

- ② +2dB: where the tonality is just perceptible;
- ② +4dB: where the tonality is clearly perceptible; and
- ② +6dB: where the tonality is highly perceptible.

### Impulsivity

- ② +3dB: where the impulsivity is just perceptible;
- ② +6dB: where the impulsivity is clearly perceptible; and
- ② +9dB: where the impulsivity is highly perceptible.



## Intermittency

- ② +3dB: where the intermittency is readily distinctive against the acoustic environment.
- 2.2.5 Where the assessment is carried out using the objective method, the tonality penalty is either 0dB or 6dB and the impulsivity penalty can range from 0dB up to 9dB in increments of 1dB, depending on the level of impulsivity identified.
- 2.2.6 In addition to the above acoustic features, there is a penalty for 'other sound characteristics' of +3dB where a sound exhibits characteristics that are neither tonal nor impulsive, though is readily distinctive against the acoustic environment.
- 2.2.7 BS4142 goes on to state that the rating level is equal to the specific sound level if there are no such features present or expected to be present.
- 2.2.8 Assessment of the rating level relative to the background noise level can yield the following commentary:
- ② Typically, the greater this difference (between the rating level and the background sound level), the greater the magnitude of impact;
  - ② A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
  - ② A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and
  - ② The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.
- 2.2.9 Whilst the amended 2019 Standard does make various references to it not being intended to assess noise impacts at indoor locations, section 1.1 does state 'The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident'. Example 6 in the Standard states 'In addition to the rating/background sound level comparison shown in Table A.6, the primary concern is the potential for disturbance of residents who could be sleeping with open bedroom windows. Other guidance, such as BS 8233, might also be applicable in this instance'.
- 2.2.10 With the above in mind, and for a clear need to ensure that any potential commercial or industrial noise impacts at the building façade do not give rise to internal noise level which causes sleep disturbance in bedrooms, this Assessment will ensure that the predicted rating level (specific sound level including any character corrections) does not exceed 30dB in bedrooms.

## **2.3 Local Authority Guidance and Criteria – Darlington Borough Council’s Environmental Health Department**

- 2.3.1 Consultation with Darlington Borough Council has been completed and the following correspondence was provided:

*‘We have been instructed by a client to complete a Noise Impact Assessment at North Yorkshire Polymer Compounds (NYPC) at 15 Banks Road in Darlington DL1 1YF. It is understood that proposals include for the increase in operating hours from existing to 24-hours over 5-days per week. As the closest residential dwellings lie approximately 290m to the south of the Site, it is expected that Darlington Borough Council will require a Noise Impact Assessment to accompany the scheme planning application.*

*The following noise surveys will be completed:*

- *Background Sound Survey; to be completed in a location considered to be representative of the sound climate at the closest residential dwellings to the Site over a full 24-hr weekday period; and*
- *Source Noise Survey; to be completed on Site for all plant and machinery which will operate over the extended operating times.*

*We will complete the following assessments:*

- *Commercial Noise: An assessment will be completed in line with the criteria presented in BS4142:2014+A1:2019 for the extended operating times.*

*Where exceedances of any criteria are identified Professional Consult will recommend appropriate and reasonable mitigation measures to ensure that the adopted noise level criteria are not exceeded which may include for the provision of acoustic barriers where required.*

*Professional Consult will issue a Noise Impact Assessment detailed in a technical report which will be suitable for issue with the scheme planning application.'*

2.3.2 A response was received on the same day stating the following:

*'In regards to the email below I'm ok with your proposed methodology for the noise assessment but would also offer the following advice.*

*I don't know if you are aware but the planning application for the site is at least partially retrospective as some alterations to the building have already taken place. The council was made aware of these alterations from a report by the occupier of another business close by. The same business operator reported that they were being impacted by noise from the North Yorkshire Polymer Compounds (NYPC) business. I think that presently the NYPC business is operating from a premises which has a B8 planning use class of Storage and Distribution and as part of their application they will need to apply to convert this to a B2 General Industrial use class. Therefore it would be helpful if your assessment contained comments on the prevailing acoustic environment in the area and the types of commercial or industrial sounds which can be heard. It would also be helpful if the BS4142 contained an assessment of the noise at a receptor on the northern boundary of the NYPC site on the industrial estate. Your report can make comment on the sensitivity of a receptor in this location and how a receptor here would be less sensitive to noise than a residential dwelling. Including this information would be helpful in assessing the impact of the proposed change of planning use classification.'*

### 3 NOISE SURVEYS

#### 3.1 Background Sound Survey

3.1.1 Professional Consult has completed a background sound survey in a location considered to be representative of the noise climate at the closest residential dwellings to the Site, as follows:

② Noise Measurement Position 1: Located 290m to the south west of the Site between 11:45 on Thursday 17<sup>th</sup> June and 11:45 on Friday 18<sup>th</sup> June 2021. Noise measurements were taken in free-field conditions and noise sources at the microphone location comprised of distant road traffic noise from vehicles using the surrounding local road network. The noise measurement location was considered representative of the noise climate at the dwellings off The Broadway and there was no commercial noise present at the microphone location.

3.1.2 Table 2 details the measured background sound levels between 18:00 and 06:00 which is the proposed extended period of operation.

**Table 2. Measured Background Sound Levels**

Measurement Position	Period	Range of Measured 15min Background Noise Levels and (Typical Background Sound Level), $L_{A90,15mins}$ (dB)
1	Daytime (06:00 – 23:00)	29 – 46 (44*)
	Night-time (23:00 – 06:00)	28 – 52 (29*)
*Mode average		

#### 3.2 Source Noise Survey

3.2.1 Professional Consult has completed a series of noise measurements on Site of all mechanical and electrical plant which will operate during the extended operating period, as follows:

**Table 3. Summary of Measured Source Noise Levels**

Noise Source	Measured / Observed / Library Noise Level for Plant (dB)	Sound Pressure / Power Level (dB)	On-time for BS4142 Assessment (mins)	Measurement Distance (m)	Notes
Internal reverberant noise level inside Process Building	Measured	86* $L_{Aeq,15mins}$	60 (day) 15 (night)	N/A	-
Generator – located externally adjacent to Process Building	Measured	84.2 $L_{Aeq,T}$	60 (day) 15 (night)	1	-
Fork Lift Truck	Library	69.3 $L_{Aeq,T}$	10 (day) 10 (night)	6	Observed on Site, not operational

**Notes**  
 Measured Noise Level – the measured specific noise level at the time of the noise survey  
 Observed Noise Level – the noise level stated on the plant item  
 Library Noise Level – Where an item of plant exists on Site but was not operational and so reliance has been placed on library noise level data  
 \*Highest measured internal reverberant  $L_{Aeq,15mins}$  between 06:00 – 18:00. The typical (mode average) internal noise level was 84dB and the minimum noise level was 63dB

### 3.3 Noise Survey Equipment

3.3.1 The following equipment was used for the Noise Survey.

**Table 4. Noise Measurement Equipment**

Measurement Position	Equipment Description	Manufacturer & Type No	Serial No.	Calibration Due Date
1	Sound Level Meter	01dB Fusion	12038	25 March 2023
	Pre-amplifier	01dB PRE22	1805093	
	Microphone	GRAS 40CE	330801	
	Calibrator	01dB CAL-31	87280	02 July 2021
On-site Source Noise	Sound Level Meter	01dB Fusion	12586	24 June 2022
	Pre-amplifier	01dB PRE22	367351	
	Microphone	GRAS 40CD	2004163	
	Calibrator	01dB CAL-31	92222	02 July 2021

3.3.2 The sound level meter was field calibrated prior to and following the noise survey and there was no drift beyond the allowable limit of 1dB.

3.3.3 During the noise surveys the weather conditions were conducive to the measurement of environmental noise, i.e. wind speeds of no more than 5m/s and dry conditions and Table 4 details the measured weather conditions.

**Table 5. Range of Measured Wind Speeds**

Period	Range of Measured Wind Speeds (m/s)	Rainfall Recorded?
Background Sound Survey	0 – 0.7	No

## 4 NOISE IMPACT ASSESSMENT

### 4.1 Assessment Information & Inputs

4.1.1 The following noise sensitive residential dwellings have been identified and accounted for in this Assessment.

**Table 6. Identified Receptors**

Receptor	Identifier	Type	Noise Model Receiver Location
Broadway	R1	Residential	At facade, 1.5m above ground for daytime and 4.5m above ground for night-time
Spindle Grove	R2	Residential	At facade, 1.5m above ground for daytime and 4.5m above ground for night-time
Gib Avenue	R3	Residential	At facade, 1.5m above ground for daytime and 4.5m above ground for night-time
Roker Close	R4	Residential	At facade, 1.5m above ground for daytime and 4.5m above ground for night-time
NYPC Northern Boundary	R5	Commercial	On Boundary – 1.5m above ground

### 4.2 Calculation of Specific Noise Levels at Receptors

4.2.1 The predominant source of noise on the Site is noise breakout from the Process Building which has an open door facing east (into the Site) which measures approximately 6m x 6m. Due to operations occurring within the building, the building itself becomes the noise source and so it is necessary to calculate the sound power level of the facades and roof of the building. In terms of sound transmission from inside to outside, it is necessary to consider the effect of each façade and roof individually, with each becoming noise sources. Accordingly, the facades have been split into the following building components:

- ☉ North Façade;
- ☉ East Façade (includes open door 6m x 6m);
- ☉ South Façade;
- ☉ West Façade; and
- ☉ Roof.

4.2.2 Calculation of the sound pressure level immediately outside the building components by using the following equation:

$$\text{SPL outside} = \text{SPL inside} - R - 6\text{dB}$$

Where: 'R' is the Sound Reduction Index for the building component

4.2.3 Calculation of the sound power level for each building component by using the following equation:

$$L_w = \text{SPL} + 10 \times \log S$$

Where: 'S' is the surface area in square meters of the building component

4.2.4 Professional Consult has noted the approximate façade specification for the building as follows:

- ② Walls: Observed 1mm thick corrugated steel which has an approximate sound reduction index of 29dB  $R_w$ ; and
- ② Roof: Assumed 1mm thick corrugated steel which has an approximate sound reduction index of 29dB  $R_w$ .

4.2.5 Table 7 calculates the sound power levels for the facades of the Process Building.

**Table 7. Calculated Sound Power Levels for Building Components**

Unit	Façade	Calculated Sound Power Level, $L_{WA}$ (dB)
Process Building	North	71.6
	East	72.1
	East (open door component)	86.0*
	South	71.6
	West	72.1
	Roof	79.8

\*Highest measured internal 15-min noise level taken as being  $L_{Aeq,T}$  at door  
 \*\*Note – a 15-minute time-averaging period has been used to inform the daytime assessment also which ensures a worst-case assessment.

4.2.6 Table 8 calculates the daytime and night-time sound power levels for the Fork-lift Truck operating externally. The sound power level has been calculated based on the reference periods in BS4142:2014+A1:2019 which is 1hr for the daytime period and 15-minutes for the night-time period.

**Table 8. Calculated Sound Power Levels for Fork Lift Truck**

Period	Measured Noise Level, $L_{Aeq,T}$ (dB)	Noise Measurement Distance (m)	Calculated Sound Power Level, $L_{WA}$ (dB)	On-time During Daytime / Night-time (mins)	Reference Period in BS4142:2014+A1:2019 (mins)	Calculated Time-corrected Sound Power Level, $L_{WA}$ (dB)
Day	69.3	6	85.1	10	60	77.3
Night	69.3	6	85.1	10	15	83.3

4.2.7 In order to calculate an accurate overall specific sound pressure level at the closest residential receptors, a noise model has been built using CadnaA and the following inputs have been included in the model:

- ② Proposed Scheme Layout;
- ② Site elevations have been taken as existing;

- ② Vertical area sources have been used for the facades of the buildings and an area source for the roof;
- ② A line source has been used in the yard area for Fork Lift movements;
- ② A point source has been used for the Generator outlet;
- ② A reflection order of 2 has been used in all calculations; and
- ② Noise levels generated using ISO 9613-1 and ISO 9613-2 "Acoustics - Attenuation of sound during propagation outdoors" as incorporated into CadnaA software.

4.2.8 Figure 1 in Appendix 4 details the grid noise map during the daytime period (18:00 – 23:00). Analysis of the grid noise maps indicates the following calculated specific sound pressure levels at the closest receptors to the Site.

**Table 9. Calculated Specific Sound Pressure Level at Receptors - Daytime**

Receptor	Calculated Sound Pressure Level, $L_{Aeq,1hr}$ (dB)
R1	35.9
R2	31.0
R3	25.6
R4	29.4
R5	67.6

4.2.9 Figure 1 in Appendix 5 details the grid noise map during the night-time period (23:00 – 06:00). Analysis of the grid noise maps indicates the following calculated specific sound pressure levels at the closest receptors to the Site.

**Table 10. Calculated Specific Sound Pressure Level at Receptors – Night-time**

Receptor	Calculated Sound Pressure Level, $L_{Aeq,15mins}$ (dB)
R1	35.0
R2	30.7
R3	26.7
R4	30.2
R5	67.5

4.2.10 The following has been considered in determining if any acoustic features exist in the predicted noise level at the closest residential receptor:

- ② **Tonality:** In determining if any tones exist in the measured noise levels, the methodology set out in BS4142:2014 has been followed using the subjective method;
- ② **Impulsivity:** In determining if any impulsiveness is evident in the measured noise levels, the methodology set out in BS4142:2014 has been followed using the subjective method;
- ② **Intermittency:** Whether or not the measured operations turn on or off during the assessment reference periods; and
- ② **Other sound characteristics:** Where no penalties are allocated for the above features, but there will be an audible noise at the closest receptor.

4.2.11 Table 11 allocates the character corrections.

**Table 11. Allocation of Character Corrections**

Noise Source	Tonality Correction (dB)	Impulsivity Correction (dB)	Intermittency Correction (dB)	Other Sound Characteristic Correction (dB)	Comments
Noise Breakout from Process Building	0	0	0	3	Noise may be just audible at receptors during periods of low residual noise at receptors
Generator	0	0	0	3	Noise may be just audible at receptors during periods of low residual noise at receptors
FLT Movements	0	0	3	0	Noise source is intermittent
<b>Highest Correction for Assessment Period</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	
<b>Overall Correction to be added to Specific Noise at Receptors</b>	<b>+6</b>				

4.2.12 Table 12 completes the BS4142 Assessment.

**Table 12. BS4142 Assessment**

Period	Receptor	Overall Worst-case Calculated Specific Noise Level at Receptor, $L_{Aeq,T}$ (dB)	Total Overall Character Correction (dB)	Calculated Rated Level (dB)	Criteria Noise Level (dB)	Difference +/- (dB)
Daytime	R1	35.9	6	41.9	44	-2.1
	R2	31.0	6	37.0	44	-7.0
	R3	25.6	6	31.6	44	-12.4
	R4	29.4	6	35.4	44	-8.6
	R5*	67.6	6	73.6	44	+29.6
Night-time	R1	35	6	41	29	+12
	R2	30.7	6	36.7	29	+7.7



	R3	26.7	6	32.7	29	+3.7
	R4	30.2	6	36.2	29	+7.2
	R5*	67.5	6	73.5	29	+44.5

\*Receptor added at request of Darlington Borough Council for indicative purposes. A commercial entity does not fall within the scope of BS4142:2014+A1:2019 as it is not a residential receptor.

4.2.13 A review of Table 12 indicates that, for the daytime period at the residential dwellings, the rated level of noise falls below the typical background sound level (the criteria noise level). This is particularly important as resident will potentially use their garden areas during summer months and BS4142:2014+A1:2019 provides the following advice for this outcome:

*'Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.'*

4.2.14 A review of Table 12 indicates that, for the night-time period at the residential dwellings, the rated level of noise exceeds the criteria noise level however it should be noted that residents are not reasonably expected to use their garden areas during the night-time period and so consideration of internal noise levels within bedrooms is of greater importance, as advised in BS4142:2014+A1:2019. Taking the highest predicted rated level of 41dB (The Broadway) and allowing 15dB for a partially open window affords an internal noise level of 26dB which falls 4dB below the night-time internal target noise criteria level suggested in BS8233:2014. As such and in context, the predicted night-time noise levels should not give rise to significant noise impacts when residents are likely to be sleeping at night.

## 5 CONCLUSION

- 5.1.1 Professional Consult Limited was instructed by Prism Planning on behalf of North Yorkshire Polymer Compounds to prepare a Noise Impact Assessment for the proposed extension to operating hours at NYPC located at 15 Banks Road in Darlington DL1 1AT.
- 5.1.2 The Site currently operates between 06:00 – 18:00 Monday to Friday and it is understood that proposal seek to extend these operating hours over a full 24-hr period from Monday to Friday.
- 5.1.3 The Site is located in a commercial area and the sound climate in the locality of the Site comprises of various commercial process noise and noise from vehicles using the local road network.
- 5.1.4 The Site comprises of two main buildings; a Process Building where plastic material is handled and a Finished Goods Building where processed material is stored. Externally there is a Generator located between the two buildings and there are occasional Fork Lift Truck movements between the two buildings and across the Site.
- 5.1.5 The closest residential dwellings to the Site lie to the south off The Broadway, to the east off Gibb Avenue and Spindle Grove and to the north east off Roker Close.
- 5.1.6 This Assessment has been undertaken to identify the key sources of noise associated with operation of the Site which may adversely impact upon existing residential amenity. Accordingly, this Assessment has been completed with due regard to the National Planning Policy Framework and its associated National Planning Policy Guidance in addition to appropriate British Standards and guidance documents relevant to the assessment of noise impacts.
- 5.1.7 This Assessment has relied upon a background sound survey completed in a location considered to be representative of the sound climate at the closest residential dwellings to the Site. This Assessment has also relied upon a series of on-Site source noise measurements taken for all mechanical and electrical plant which will operate over the extended operating times.
- 5.1.8 For the daytime period, the Assessment has shown that the rated level of noise falls below the criteria noise level for all residential dwellings and BS4142:2014+A1:2019 provides the following advice for this outcome:
- 'Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.'*
- 5.1.9 For the night-time period, the Assessment has shown that the rated level of noise within bedrooms falls below the internal target noise criteria for sleep disturbance.
- 5.1.10 The predicted noise levels at the surrounding receptors from proposed operations at the Site are considered to be sufficiently low enough to afford compliance with the 'No Observed Adverse Effect Level' as detailed in the PPG and as such noise should not be deemed to be a determining factor in the granting of planning permission for this Site.

## **APPENDIX 1: LIMITATIONS**

This report and its findings should be considered in relation to the terms of reference and objectives agreed between Professional Consult Limited and the Client.

The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

Professional Consult cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by Professional Consult is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by Professional Consult in this connection without their explicit written agreement there to by Professional Consult.

## APPENDIX 2: GLOSSARY OF ACOUSTIC TERMINOLOGY

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or  $L_{Aeq}$ ,  $L_{A90}$  etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

An indication of the range of sound levels commonly found in the environment is given in the following table.

**Table 1: Typical Sound Pressure Levels**

Sound Pressure Level (dB)	Location/Example
0	Threshold of hearing
20 - 30	Quiet bedroom at night
30 - 40	Living room during the day
40 - 50	Typical office
50 - 60	Inside a car
60 - 70	Typical high street
70 - 90	Inside factory
100 - 110	Burglar alarm at 1m away
110 - 130	Jet aircraft on take off
140	Threshold of pain

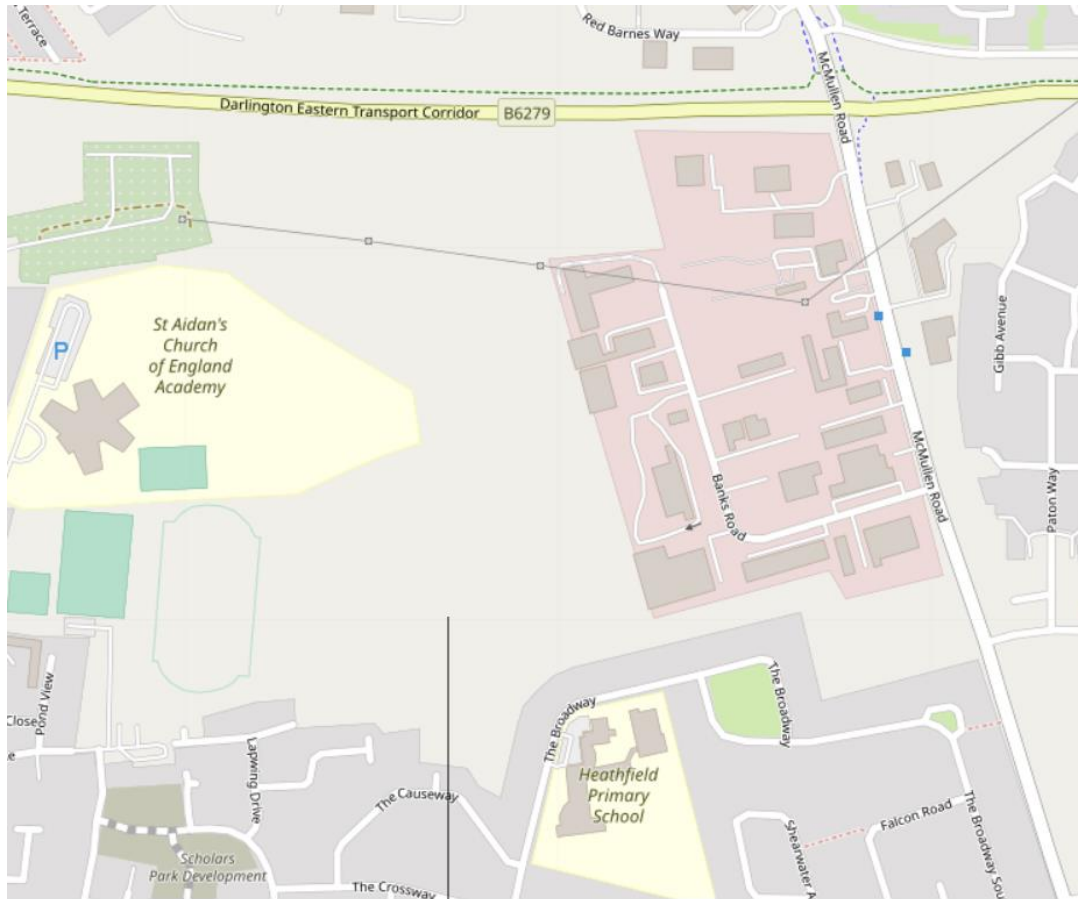
**Table 2: Terminology**

Descriptor	Explanation
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2x10 <sup>-5</sup> Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
L <sub>Aeq, T</sub>	L <sub>Aeq</sub> is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.
L <sub>Amax</sub>	L <sub>Amax</sub> is the maximum A - weighted sound pressure level recorded over the period stated. L <sub>Amax</sub> is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L <sub>10</sub> & L <sub>90</sub>	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L <sub>10</sub> is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L <sub>90</sub> is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L <sub>10</sub> index to describe traffic noise.
Free-field Level	2A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally as measured outside and away from buildings.
Fast	A time weighting used in the root mean square section of a sound level meter with a 125millisecond time constant.
Slow	A time weighting used in the root mean square section of a sound level meter with a 1000millisecond time constant.

### APPENDIX 3: BACKGROUND SOUND MEASUREMENT LOCATION

Figure 1

Proposed Site Plan



Background Sound  
Measurement Location

APPENDIX 4: CADNA-A GRID NOISE MAP – DAYTIME

Figure 1

Daytime

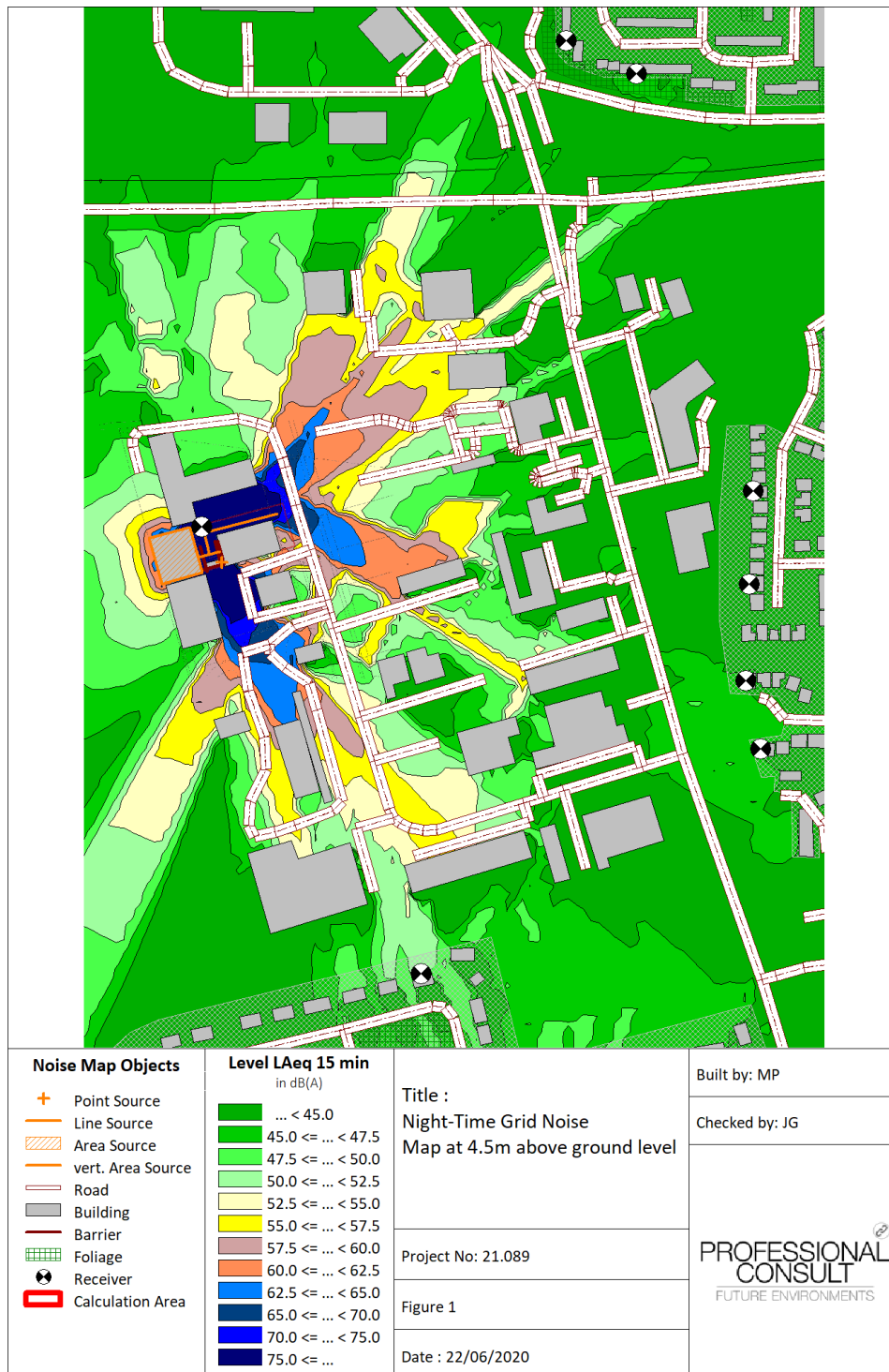


<b>Noise Map Objects</b> + Point Source — Line Source ▨ Area Source — vert. Area Source — Road ■ Building — Barrier ▨ Foliage ⊗ Receiver □ Calculation Area	<b>Level LAeq 1 hour</b> in dB(A) ■ ... < 30.0 ■ 30.0 <= ... < 32.5 ■ 32.5 <= ... < 35.0 ■ 35.0 <= ... < 37.5 ■ 37.5 <= ... < 40.0 ■ 40.0 <= ... < 42.5 ■ 42.5 <= ... < 45.0 ■ 45.0 <= ... < 47.5 ■ 47.5 <= ... < 50.0 ■ 50.0 <= ... < 52.5 ■ 52.5 <= ... < 55.0 ■ 55.0 <= ...	Title: Daytime Grid Noise Map 1.5m above ground level	Built by: MP
		Project No: 21.089 Figure 1 Date : 22/06/2020	Checked by: JG PROFESSIONAL CONSULT FUTURE ENVIRONMENTS

APPENDIX 5: CADNA-A GRID NOISE MAP – NIGHT-TIME

Figure 1

Night-time

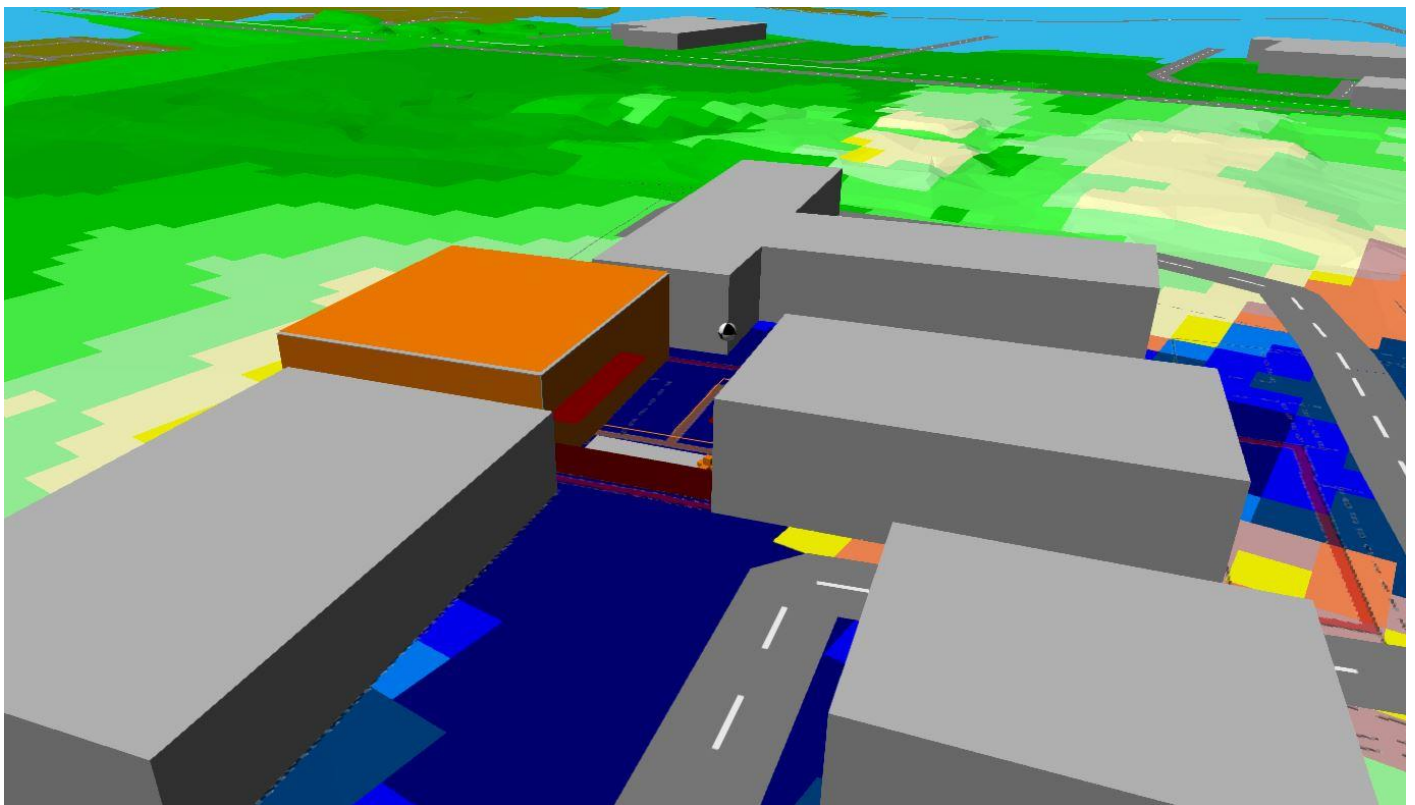
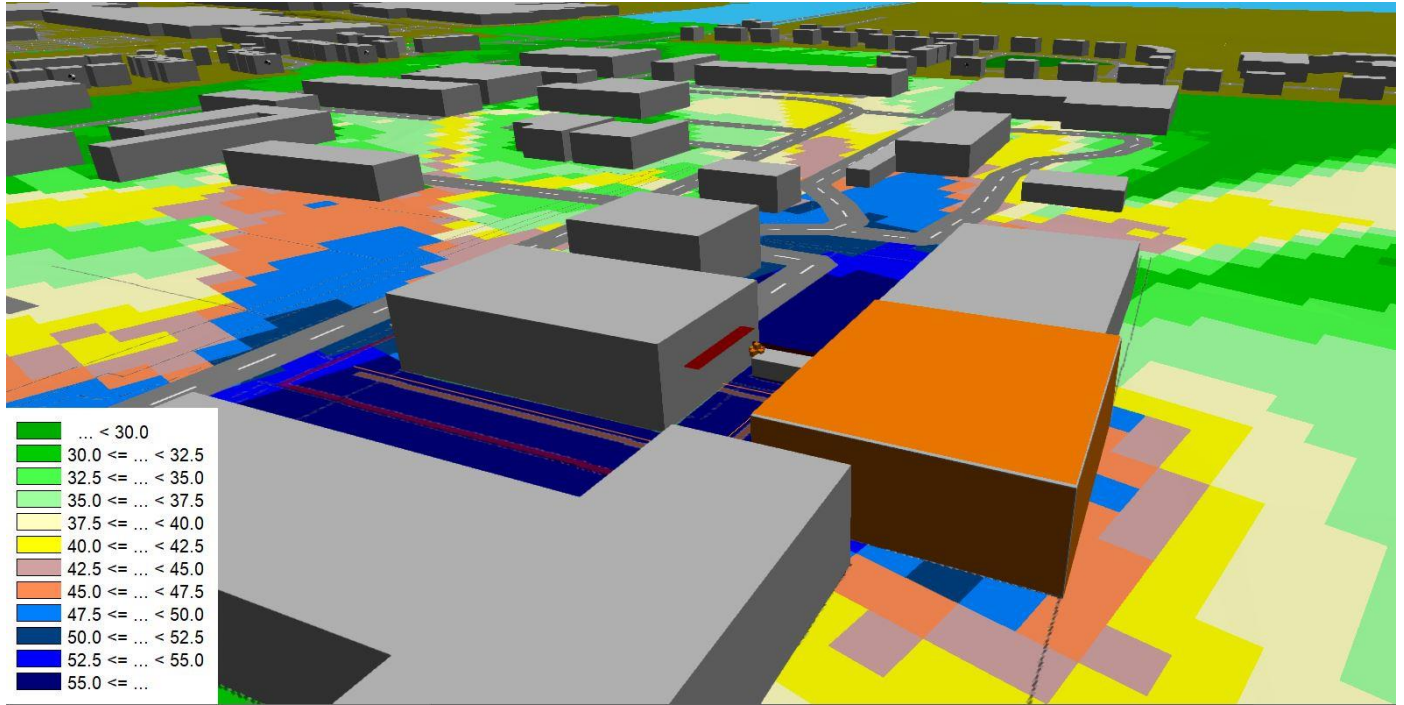




APPENDIX 6: CADNA-A GRID NOISE MAP – 3D MODELS

Figure 1

3D Models



**APPENDIX 7: MEASURED BACKGROUND SOUND LEVELS**

Period start	Measured Sound Pressure Level, dBA	
	Leq	L90
17/06/2021 11:45	53.7	43.4
17/06/2021 12:00	48.9	42.5
17/06/2021 12:15	45	39.6
17/06/2021 12:30	45.6	39.4
17/06/2021 12:45	41.1	38.8
17/06/2021 13:00	43.8	40.6
17/06/2021 13:15	44.6	42.5
17/06/2021 13:30	45.5	42.8
17/06/2021 13:45	43.9	41.5
17/06/2021 14:00	45.1	42.5
17/06/2021 14:15	45.5	43.1
17/06/2021 14:30	46	42.1
17/06/2021 14:45	45.3	41.9
17/06/2021 15:00	46	43
17/06/2021 15:15	46	43
17/06/2021 15:30	45	42.8
17/06/2021 15:45	46.5	43.2
17/06/2021 16:00	46.4	43.5
17/06/2021 16:15	46.8	42.8
17/06/2021 16:30	45.6	43.4
17/06/2021 16:45	45.9	43.8
17/06/2021 17:00	46	43.4
17/06/2021 17:15	47.2	42.9
17/06/2021 17:30	51	45
17/06/2021 17:45	46.4	44
17/06/2021 18:00	46.8	43.9
17/06/2021 18:15	48.6	45.6
17/06/2021 18:30	46.7	43.4
17/06/2021 18:45	48.9	44.3
17/06/2021 19:00	49.1	44
17/06/2021 19:15	46.9	44.7
17/06/2021 19:30	45.4	43
17/06/2021 19:45	45.3	42.6
17/06/2021 20:00	46.8	42.7
17/06/2021 20:15	48.2	44.3
17/06/2021 20:30	44.5	40.9
17/06/2021 20:45	46.8	41.1
17/06/2021 21:00	48.5	40.7
17/06/2021 21:15	51.4	39.5
17/06/2021 21:30	42.8	37.8
17/06/2021 21:45	41.3	36.2
17/06/2021 22:00	41.9	35.2
17/06/2021 22:15	42.8	36.8
17/06/2021 22:30	39.1	32.2

Reference: 21.089.1.R1  
 Date: 22 June 2021  
 Project: Extended Operating Hours – NYPC, Darlington

17/06/2021 22:45	37.3	28.5
17/06/2021 23:00	39.2	33.8
17/06/2021 23:15	38.2	32
17/06/2021 23:30	38.6	30.7
17/06/2021 23:45	39.4	30.8
18/06/2021 00:00	37.1	30.1
18/06/2021 00:15	39	29.5
18/06/2021 00:30	38.8	29.8
18/06/2021 00:45	36.3	29.1
18/06/2021 01:00	37.2	29
18/06/2021 01:15	34.4	27.9
18/06/2021 01:30	34.1	28.4
18/06/2021 01:45	35.6	28.9
18/06/2021 02:00	36.2	28.6
18/06/2021 02:15	35.2	29.2
18/06/2021 02:30	37.3	29.2
18/06/2021 02:45	33.1	28.4
18/06/2021 03:00	35.3	29.1
18/06/2021 03:15	41.4	32.6
18/06/2021 03:30	50.5	42.1
18/06/2021 03:45	54.4	51.7
18/06/2021 04:00	52	49.9
18/06/2021 04:15	50.2	45.9
18/06/2021 04:30	51.4	48.1
18/06/2021 04:45	50.6	46.7
18/06/2021 05:00	51.6	47
18/06/2021 05:15	54.6	46.2
18/06/2021 05:30	50.6	46.1
18/06/2021 05:45	51.5	46.3
18/06/2021 06:00	49.3	44
18/06/2021 06:15	50.4	43.7
18/06/2021 06:30	50.8	44.8
18/06/2021 06:45	49.7	46.1
18/06/2021 07:00	50.5	45.5
18/06/2021 07:15	50.9	45.2
18/06/2021 07:30	49.5	46.9
18/06/2021 07:45	50.2	47.2
18/06/2021 08:00	49.1	46.4
18/06/2021 08:15	50.4	47.2
18/06/2021 08:30	48.9	45.4
18/06/2021 08:45	49.5	45.7
18/06/2021 09:00	48.8	43.9
18/06/2021 09:15	51.1	47.1
18/06/2021 09:30	47.1	43
18/06/2021 09:45	48.8	44.8
18/06/2021 10:00	46.6	43.3
18/06/2021 10:15	44.5	41.6

Reference: 21.089.1.R1  
Date: 22 June 2021  
Project: Extended Operating Hours – NYPC, Darlington

---

18/06/2021 10:30	43.9	39.5
18/06/2021 10:45	47.8	41.4
18/06/2021 11:00	48.4	44.2
18/06/2021 11:15	46.9	42.5
18/06/2021 11:30	47.3	43.2