



Noise Impact Assessment

Symmetry Park Merseyside, Phase 2 Reserved
Matters

Reference: 50-356-R1-4

Date: October 2022



NOISE IMPACT ASSESSMENT

**Symmetry Park Merseyside
Phase 2 Reserved Matters**

Prepared for:

Tritax Symmetry Merseyside 1 Limited

**Report Ref: 50-356-R1-4
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EXECUTIVE SUMMARY

BACKGROUND

Site Address	Former Cronton Colliery, Fox's Bank Lane, Widnes L35 3SU
National Grid Reference	E 347362 N 389348
Proposed Development	Application for the approval of reserved matters (scale, access, appearance, layout and landscaping) comprising the development of 363,327sqft (GIA) of storage and distribution floorspace (Use Class B8) with ancillary offices and light industrial (Use Class E(g)) across two warehouse units, together with the provision of landscaping and infrastructure submitted pursuant to planning permission 20/00494/HYB.
Report Objectives	To identify, measure and assess the potential impact of the proposed commercial development upon existing residential receptors in the immediate vicinity of the Site. The report follows current and relevant British Standards in order to provide a robust assessment.

ASSESSMENT

Surveys Completed	Unattended weekday and weekend background sound surveys have previously been completed, as part of 20/00494/HYB, in positions considered representative of the closest receptors to the development.
Assessments	A BS4142:2014+A1:2019 assessment accounting for external mobile plant and any unloading/loading activities associated with the proposed development has been undertaken. The predicted rating levels have been compared to the existing typical background sound level for the daytime and night-time periods. Consideration has been given to any acoustic characteristics associated with the proposed development.
Mitigation Requirements	No specific measures are required.

CONCLUSIONS

E3P has undertaken detailed 3D noise modelling of all the proposed sources in order to predict noise levels within gardens and at 1st floor windows for the daytime and night-time periods, in accordance with BS 4142:2014, at the closest receptors.

The assessment has determined that the typical background sound level will not be exceeded at either receptor during both daytime and night-time periods.



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1. INTRODUCTION

1.1. BACKGROUND

E3P were commissioned by Tritax Symmetry Merseyside 1 Limited to undertake a Noise Impact Assessment for the Reserved Matters application for the development of 363,327sqft (GIA) of storage and distribution floorspace (Use Class B8) with ancillary offices and light industrial (Use Class E(g)) across two warehouse units, together with the provision of landscaping and infrastructure submitted pursuant to planning permission 20/00494/HYB, to be referred to hereafter as '*the site*'.

This assessment looks to determine the key noise sources associated with the development and undertake an assessment of any impacts upon existing noise sensitive receptors.

1.2. PROPOSED DEVELOPMENT

The Site is the former Cronton Colliery off Fox's Bank Lane in Widnes. The client is proposing a Reserved Matters application comprising:

Total floorspace = 363,327sqft comprising:

Unit 02

- ✳ 152,212sqft GIA of storage and distribution floorspace with ancillary offices.
- ✳ 9 Loading Docks.
- ✳ 14 Level Access Points.
- ✳ 2 Van Dock Doors.
- ✳ Van storage.
- ✳ 244 car parking spaces (including 12 accessible spaces and 122 electric charging points); and
- ✳ 12 motorcycle parking spaces.

Unit 03

- ✳ 212,114sqft GIA of storage and distribution floorspace with ancillary offices.
- ✳ 20 Loading Docks.
- ✳ 4 levels access points.
- ✳ 60 HGV parking spaces; and
- ✳ 189 car parking spaces.

The key sources of sound associated with the development will be Heavy Goods Vehicle (HGV) movements and loading/unloading activities and car park usage.

This assessment has been undertaken in accordance with the following supplied drawings produced by UMC Architects:



 Masterplan (18128 F0102 Rev B) dated 16th August 2022.

The Masterplan is shown in Figure 1 of Appendix II.

1.3. LIMITATIONS

Where a noise or vibration survey is required to inform an assessment, E3P will endeavour to ensure that all noise and vibration measurements taken are robust, representative and reliable in order to inform an accurate assessment at the time.

E3P will endeavour to capture all existing and proposed sources of sound and vibration at the time of the surveys and/or assessments. However, should new sources of sound be introduced, existing sources modified/changed, or characteristics of the sound be altered following completion of such, E3P cannot be held accountable for this.

Where mitigation measures are specified in this report, it should be noted that these measures are relative to a specific sound or vibration source, both in terms of the measured sound pressure and vibration level and the character of the sound source. Where either the sound pressure level or the character of the sound varies following completion of the sound survey, E3P cannot be held responsible for any subsequent variations in the proposed mitigation performance, for either absolute levels or frequency content.



2. ASSESSMENT METHODOLOGY

2.1. NATIONAL PLANNING POLICY FRAMEWORK

To prevent unacceptable risks from pollution, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be considered.

The national planning policy framework states 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.
- ✿ 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.

2.2. NATIONAL PLANNING PRACTICE GUIDANCE

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.

Local planning authorities' plan-making and decision-making should take account of the acoustic environment and in doing so consider:

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

In line with the explanatory note of the NPSE, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase, where 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.



The “observed effect levels” are as follows:

-  **Significant observed adverse effect level:** This is the level of noise exposure above which significant adverse effects on health and quality of life occur.
-  **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.
-  **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.

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

TABLE 2.1 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
Lowest Observed Adverse Effect Level			
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, or having to close windows for some of the time because of the noise where there is no alternative ventilation. 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
Significant Observed Adverse Effect Level			
Noticeable and Disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion, having to keep windows closed most of the time because of the noise where there is no alternative ventilation. 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 (auditory and non-auditory).	Unacceptable adverse effect	Prevent



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 situation.

These factors include the following:

- ✿ 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. The adverse effect can also be greater simply because there is less background noise at night.
- ✿ For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise can be important.
- ✿ The spectral content of the noise and the general character of the noise. The local topology and topography should also be considered along with the existing and, where appropriate, the planned character of the area.

More specific factors to consider when relevant:

- ✿ Where applicable, the cumulative impacts of more than one source should be considered along with the extent to which the source of noise is intermittent and of limited duration.
- ✿ 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.
- ✿ If external amenity spaces are an intrinsic part of the overall design, then the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.

2.3. BS 4142: 2014+A1:2019 'METHODS FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND'

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

- ✿ Sound from industrial and manufacturing processes.
- ✿ Sound from fixed installations which comprise mechanical and electrical plant and equipment.
- ✿ Sound from the loading and unloading of goods and materials at industrial and / or commercial premises; and
- ✿ 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.

The procedure detailed in the standard compares the measured or predicted specific noise level from any of the above 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.

The specific noise level also acknowledges the reference time intervals depending upon whether the noise source operates during daytime (1-hour) or night-time (15-minute) periods.



There are several 'penalties' which can be attributed to the specific sound level depending upon the 'acoustic features' of the sound level under investigation as follows:

Tonality

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

Impulsivity

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

Intermittency

-  +3dB: where the intermittency is readily distinctive against the acoustic environment.

In addition to the above, there is a penalty for 'other sound characteristics' of +3 dB where a sound exhibits characteristics that are neither tonal nor impulsive, though are readily distinctive against the acoustic environment. BS 4142 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.

Assessment of the rating level relative to the background sound level can yield the following commentary:

-  Typically, the greater this difference (between the rating level and the background sound level), the greater the magnitude of impact.
-  A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
-  A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and
-  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.

It is common that a Local Planning Authority (LPA) will specify their own criterion and, where this is the case, this criterion will usually take precedence over a simple comparison of the rating level against the background sound level.



3. SURVEY RESULTS

3.1. UNATTENDED BACKGROUND AND AMBIENT SOUND SURVEY - NORTH

As the proposed development could operate 24 hours per day over 7 days, E3P has conducted a full weekday and weekend Background Sound Survey in order to quantify the existing levels of background sound at a position considered representative of the closest non-associated residential receptors to the development, specifically in the northern area. The survey was carried out over the following period:

📅 10:00 Friday 13th March to 11:00 Tuesday 17th March 2020.

The following noise measurement position was chosen for the Background Sound Survey:

📍 Noise Measurement Position 1 (NMP1): Located on the edge of the red line boundary immediately adjacent to Old Halsnead. The microphone of the sound level meter was attached to a tripod and located in free-field conditions at a height of 1.2 m above ground level. Sound sources here were dominated by road traffic along the M62.

Table 3.1 details the range and median measured background sound levels. The daytime levels correspond to the $L_{A90,1hr}$ and the night-time levels to the $L_{A90,15mins}$. The median levels are displayed as it is considered these correspond to the 'typical' levels required for the BS 4142:2014 assessment. The levels to be used in the assessment are highlighted in bold and correspond to the most robust and worst-case assessment possible. The full hourly data is tabulated in Appendix III.

TABLE 3.1 AVERAGE AND MEDIAN MEASURED BACKGROUND SOUND PRESSURE LEVELS

DATE	ASSESSMENT PERIOD	RANGE OF MEASURED BACKGROUND SOUND LEVELS, $L_{A90,T}$ (dB)	MEDIAN MEASURED BACKGROUND SOUND LEVEL, $L_{A90,T}$ (dB)
Friday 13th March 2020	Day (11:00 – 23:00)	48.9-56.7	53
	Night (23:00 – 07:00)	40.8-51.0	45
Saturday 14th March 2020	Day (07:00 – 23:00)	49.0-54.6	52
	Night (23:00 – 07:00)	43.3-51.6	48
Sunday 15th March 2020	Day (07:00 – 23:00)	50.6-59.0	56
	Night (23:00 – 07:00)	41.6-59.3	47
Monday 16th March 2020	Day (07:00 – 23:00)	49.4-58.8	54
	Night (23:00 – 07:00)	44.6-58.3	57



3.2. UNATTENDED BACKGROUND AND AMBIENT SOUND SURVEY - SOUTH

As the proposed development could operate 24 hours per day over 7 days, E3P has conducted a full weekday and weekend Background Sound Survey in order to quantify the existing levels of background sound at a position considered representative of the closest non-associated residential receptors to the development, specifically in the southern area. The survey was carried out over the following period:

📅 10:00 Friday 13th March to 12:00 Tuesday 17th March 2020.

The following noise measurement position was chosen for the Background Sound Survey:

📍 Noise Measurement Position 2 (NMP2): Located on the edge of the red line boundary immediately adjacent to rear of Park Villas to the south of the development. The microphone of the sound level meter was attached to a tripod and located in free-field conditions at a height of 1.2 m above ground level. Sound sources here were dominated by road traffic along the Cronton Road with distant M62 traffic audible.

Table 3.2 details the range and median measured background sound levels. The daytime levels correspond to the $L_{A90,1hr}$ and the night-time levels to the $L_{A90,15mins}$. The median levels are displayed as it is considered these correspond to the 'typical' levels required for the BS 4142:2014 assessment. The levels to be used in the assessment are highlighted in bold and correspond to the most robust and worst-case assessment possible. The full hourly data is tabulated in Appendix III.

TABLE 3.2 AVERAGE AND MEDIAN MEASURED BACKGROUND SOUND PRESSURE LEVELS

DATE	ASSESSMENT PERIOD	RANGE OF MEASURED BACKGROUND SOUND LEVELS, $L_{A90,T}$ (dB)	MEDIAN MEASURED BACKGROUND SOUND LEVEL, $L_{A90,T}$ (dB)
Friday 13th March 2020	Day (11:00 – 23:00)	46.3-53.0	51
	Night (23:00 – 07:00)	41.5-49.5	44
Saturday 14th March 2020	Day (07:00 – 23:00)	47.7-53.8	52
	Night (23:00 – 07:00)	43.4-49.6	47
Sunday 15th March 2020	Day (07:00 – 23:00)	48.3-56.2	54
	Night (23:00 – 07:00)	42.2-58.0	45
Monday 16th March 2020	Day (07:00 – 23:00)	48.3-57.7	54
	Night (23:00 – 07:00)	43.5-56.4	46

Weather forecasts were monitored throughout the survey to ensure no adverse conditions as the location of the Site was not suitable for the installation of an unattended weather station. During the survey, conditions remained dry and wind speeds rarely exceeded 10 mph.



The equipment outlined in Table 3.3 was used for the noise survey.

TABLE 3.3 NOISE MEASUREMENT EQUIPMENT AND CALIBRATION DATES

MEASUREMENT POSITION	EQUIPMENT DESCRIPTION	MANUFACTURER & TYPE NUMBER	SERIAL NUMBER	LAST CALIBRATION DATE AT TIME OF SURVEY
NMP1	Sound Level Meter	Norsonic Nor145	14529152	4th July 2019
	Pre-amplifier	Norsonic Nor1209	22293	
	Microphone	Norsonic Nor1227	332220	
	Calibrator	Norsonic Nor1255	125525208	12th June 2020
NMP2	Sound Level Meter	01dB Fusion	12039	21st June 2019
	Pre-amplifier	01dB Pre22	Internal	
	Microphone	01dB 40CE	330832	
	Calibrator	01dB Cal31	87281	25th February 2020

The sound level meters were field calibrated on site using the above-mentioned calibrator prior to and after noise measurements were taken. No significant drift was witnessed as noted above. Calibration certificates are available upon request.



4. NOISE IMPACT ASSESSMENT

This assessment has used previously measured noise levels for HGVs and unloading/loading activities, applied at previous similar B8 use sites, to predict the noise level impact on the existing closest residential dwellings during the daytime and night-time periods. E3P have previously agreed on the assessment methodology as part of the outline planning application with Knowsley Metropolitan Borough Council's Environmental Health Department.

Regarding assumptions for the assessment, the following has been considered within a 3D noise model:

- ✿ For the purposes of the internal road feeding Unit 2, a figure of 441 total vehicles with 119 HGVs is inputted into the model in accordance with the traffic flow data provided by Vectos. The road is assumed to have a speed limit of 30 mph. This equates to an average of 10-11 HGVs per hour along this access.
- ✿ The internal road up to this point is inputted as per the outline planning application.
- ✿ A 3 m high bund and 2.5 m high fence is proposed along the shoulder of the access road into Unit 2 and is included in all models.
- ✿ The daytime period has been assessed between the hours of 07:00 to 23:00. For the assessment, BS 4142:2014 has been used to determine the likelihood of adverse impact within the garden areas over a reference period of 1 hour.
- ✿ The night-time period has been assessed between the hours of 23:00 and 07:00 for a reference period of 15 minutes.
- ✿ During the daytime periods, it is assumed, in order to inform a worst-case assessment, that at least half of all dock levellers can be in use at once with HGVs driving up and reversing into the levellers and then unloading/loading activities then taking place in any given 1 hour period.
- ✿ During the night-time, given the shorter period, only 50% of the dock levellers are proposed to be in use. The closest levellers to the receptors have been chosen to be in use within the model to inform a worst-case assessment.
- ✿ The measured on-time periods have been corrected to account for the hourly and 15-minute assessment periods given in BS 4142:2014.
- ✿ Additional external activities, such as forklift trucks, etc, have not been accounted for as the exact usage at the units is unknown at this stage and dock levellers have been proposed for all units at this stage. However, it is considered that the main source of noise impacting the receptors will be HGV movements and loading/unloading activities.
- ✿ Existing Site elevations in the form of 2m contours from a Digital Terrain Model (DTM) which contains public sector information licensed under Open Government License v3.0. On -site elevations are corrected to account for the finished floor levels (FFL) as close as possible.
- ✿ HGV operations are inputted as point sources and as spectrum type.



- ✿ 4 m high barriers are proposed around the service yard and a short stretch along the northern boundary. These are included in the model and shown in the Figures.
- ✿ A reflection order of 2 has been used in all calculations along with a 0.5 correction for soft ground attenuation; and
- ✿ Noise levels generated using ISO 9613-1 and ISO 9613-2 “Acoustics – Attenuation of sound during propagation outdoors” as incorporated into CadnaA software.

No information on proposed fixed plant items has been made available. However, there is no proposed warehouse cooling and any roof plant would therefore be limited.

For the BS 4142:2014+A1:2019 assessments, penalties are applied to the specific sound level in order to provide the rating level. These penalties relate to the acoustic features of the sound source. Accordingly, the following subjective features have been accounted for in the assessment, in accordance with the subjective method detailed in BS 4142:2014, for the units as a whole operation.

TABLE 4.1 ACOUSTIC PENALTIES

SOURCE	CHARACTERISTIC	ATTRIBUTABLE PENALTY	COMMENT
Class B8 Warehouse Unit with Service Bays	Tonality	2 dB	It is assumed all HGVs would be fitted with white noise reverse alarms with tones just perceptible at the receptors.
	Impulsivity	-	No impulsivity is expected as unloading/loading operations are internal
	Intermittency	3 dB	It is assumed that intermittent movements and unloading/loading activities will be readily discernible at certain receptors.
	Other Sound Characteristics	-	Other penalties applied.

4.1. DAYTIME ASSESSMENT

Table 4.2 details the resultant specific noise level at each receptor, outputted from the model. The grid noise map can be seen in Figure 2. The Rating Level is then calculated based on the acoustic penalties in Table 4.1. The lowest modal background sound levels during the daytime periods have been used. This informs a worst-case assessment.

Consideration of context is required here given that resultant noise levels at certain receptors are due to road traffic sound along the access road only and not specifically commercial sound. BS 4142:2014+A1:2019 does not consider road traffic sound to be attributable to the commercial assessment. It does consider all other sources and they are included here to inform a worst-case assessment. However, where receptors are subject to road traffic sound only, a more holistic approach is required.

Acoustic penalties are applied on a receptor-by-receptor basis depending on the perceptibility of certain features accounting for distance from sources.

Furthermore, the Country Park is not subject to a BS 4142 assessment as it falls outside of the scope. However, it is included here to inform an assessment of perceived tranquillity.



TABLE 4.2 CALCULATION OF RATING LEVEL AND COMPARISON WITH BACKGROUND SOUND LEVEL - DAYTIME

RECEPTOR	CALCULATED SPECIFIC NOISE LEVEL, $L_{Aeq,1hr}$ (dB)	TOTAL PENALTY (dB)	TOTAL RATING LEVEL, $L_{A,r}$ (dB)	LOWEST MODAL MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)	DIFFERENCE +/- (dB)
Old Halsnead/ Halsnead Villas	44	3	47	52	-5
The Bungalow/ Halsnead Farm	30	3	33	52	-19
Dwellings to the east	29	5	34	52	-18
Caravans/ lodges to the east	33	5	38	50	-14
Dwellings associated with the caravan park	32	-	32	50	-18
Single dwelling at junction of Fox's Bank and Cronton Road	37	-	37	50	-13
Fox's Bank Cottages	40	-	40	50	-10
Park Villas	55	-	N/A	N/A	N/A
Tarbock Lodge	36	-		50	
Proposed Country Park	55	-	N/A	N/A	N/A

Table 4.2 indicates that the predicted rating level falls below the existing typical background sound level during daytime periods within the closest garden areas. As such, no consideration towards mitigation measures is required.

With regards to Park Villas, these receptors are only subject to noise associated with the access road and the Country Park car park. As such, a BS 4142 assessment is not strictly applicable here. As such, the worst-case noise level, 55 dB is considered in relation to the existing ambient noise levels experienced as well as the criterion given in BS 8233:2014.

Existing ambient noise levels range between 50 and 60 dB, with an average of 55 dB. When considering the logarithmic addition of the access road and car park, a change of +1.2 dB is predicted. This would result in a negligible change. Furthermore, average daily ambient noise levels range between 53 and 57 dB, thus exceeding external and internal noise levels currently. As such, the introduction of the access road and car park, although likely to increase noise levels, do not adversely impact the receptors.



When considering the Country Park, again BS 4142 does not apply. The highest predicted specific noise level is expected to be 55 dB due to, primarily, road traffic sound. This achieves the upper criterion for garden areas at dwellings and, as such, is considered acceptable.

4.2. NIGHT-TIME ASSESSMENT

The noise model has been used to predict the specific noise level at the receptors during the night-time period. Table 4.3 details the resultant specific noise level at each receptor, outputted from the model. The grid noise map can be seen in Figure 3.

Consideration of context is required here given that resultant noise levels at certain receptors are due to road traffic sound along the access road only and not specifically commercial sound. BS 4142:2014 does not consider road traffic sound to be attributable to the commercial assessment. It does consider all other sources and they are included here to inform a worst-case assessment. However, where receptors are subject to road traffic sound only, a more holistic approach is required.

Acoustic penalties are applied on a receptor-by-receptor basis depending on the perceptibility of certain features accounting for distance from sources. Furthermore, the Country Park is not included for the night-time period.

TABLE 4.3 CALCULATION OF RATING LEVEL AND COMPARISON WITH BACKGROUND SOUND LEVEL - NIGHT

RECEPTOR	CALCULATED SPECIFIC NOISE LEVEL, $L_{Aeq,15mins}$ (dB)	TOTAL PENALTY (dB)	TOTAL RATING LEVEL, $L_{A,r}$ (dB)	LOWEST MODAL BACKGROUND SOUND LEVEL, $L_{A90,15mins}$ (dB)	DIFFERENCE +/- (dB)
Old Halsnead/ Halsnead Villas	39	3	42	42	0
The Bungalow/ Halsnead Farm	27	3	30	42	-12
Dwellings to the east	23	5	28	42	-14
Caravans/ lodges to the east	31	5	36	44	-8
Dwellings associated with the caravan park	28	-	28	44	-16
Single dwelling at junction of Fox's Bank and Cronton Road	32	-	32	44	-12
Fox's Bank Cottages	33	-	33	44	-11
Park Villas	41	-	41	44	-3
Tarbock Lodge	31	-	31	44	-13



Table 4.3 indicates that the predicted rating level achieves or falls below the typical measured background sound level during the night-time period at all receptors.

In addition to the BS 4142:2014 assessment it is also important to consider internal noise levels within bedrooms with windows open. Here the highest predicted internal noise level would be 26 dB, accounting for a 13 dB reduction due to an open window. This falls below the criterion given in BS8 233:2014 for suitable sleeping conditions.

As such, no mitigation measures are required.

4.3. NIGHT-TIME CAR PARK ASSESSMENT – MAXIMUM INSTANTANEOUS NOISE

As well as average noise levels due to the development, consideration is given to maximum instantaneous events impacting upon receptors at night. Specifically, the resultant noise level from the proposed car parks/van storage area due to car/van door slams. This assessment is only applicable to receptors near car parks, such as Old Halsnead/Halsnead Villas and Park Villas. With regards to Park Villas, it is assumed that car door slams could occur in the Country Park car park between 06:00 and 07:00 but for a very limited number of vehicles.

HGV activity at the docks may result in higher maximum noise levels but due to the increased distance results in a lower noise level at the receptors than those considered below.

The assessment has used a typical sound level of 75 dB at 2 m for a car door slam. Table 4.4 details the maximum noise level assessment with a comparison against the WHO Guidelines criterion.

TABLE 4.4 MAXIMUM NIGHT-TIME NOISE LEVEL ASSESSMENT – CAR PARK

RECEPTOR	MEASURED MAXIMUM NOISE LEVEL AT 2 m, $L_{Amax,fast}$ (dB)	DISTANCE FROM RECEPTOR TO CLOSEST CAR PARK SPACE (m)	PREDICTED MAXIMUM NOISE LEVEL AT RECEPTOR (dB)	WHO GUIDELINES EXTERNAL CRITERION (dB)	DIFFERENCE, +/- (dB)
Old Halsnead/ Halsnead Villas	75	40	49	60	-11
The Bungalow/ Halsnead Farm	75	28	52	60	-8

The assessment has shown compliance with the WHO Guidelines external criterion



5. CONCLUSION AND RECOMMENDATIONS

E3P were commissioned by Tritax Symmetry Merseyside 1 Limited to undertake a Noise Impact Assessment for the Reserved Matters application in relation to Phase 2 of the Symmetry Park Merseyside Site at the former Cronton Colliery in Widnes.

This assessment looked to determine the key noise sources associated with the development and undertake an assessment of any impacts upon existing noise sensitive receptors.

Two full weekday and weekend background sound survey was undertaken in a position considered representative of the closest existing residential receptors to the site.

E3P has undertaken detailed 3D noise modelling of all the proposed sources to predict noise levels at ground and 1st floor windows for the daytime and night-time periods respectively, in accordance with BS 4142:2014, at the closest receptors.

The assessment has shown that the predicted rating level falls below the typical measured background sound level during the daytime and night-time periods. Consideration has also been given to night-time noise impacts due to car park usage and HGVs accelerating passed certain receptors.

In addition to the BS 4142:2014 assessment it is also important to consider internal noise levels within bedrooms with windows open. Here the highest predicted internal noise level would be 26 dB, accounting for a 13 dB reduction due to an open window. This falls below the criterion given in BS 8233:2014 for suitable sleeping conditions.

As such, no mitigation measures are required. The proposed 4 m high barriers and 3 m bund with 2.5 m high fence on top are included in the model and are considered embedded mitigation.

This assessment has shown that there should be no adverse impact upon existing residential receptors due to the proposed operations. As such, noise should not be a determining factor in the determination of the planning application.

END OF REPORT



APPENDIX I

GLOSSARY OF ACOUSTIC TERMINOLOGY

NOISE

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 A1 TYPICAL SOUND PRESSURE LEVELS

SOUND PRESSURE LEVEL	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 a factory
100–110	Burglar alarm at 1 m away
110–130	Jet aircraft on take off
140	Threshold of pain



ACOUSTIC TERMINOLOGY

TABLE A2 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 (2E-05 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_{Aeq, T}	L _{Aeq} 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_{Amax}	L _{Amax} is the maximum A-weighted sound pressure level recorded over the period stated. L _{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L _{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the "fast" sound level meter response.
L₁₀ and L₉₀	If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The L _n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L ₁₀ is the level exceeded for 10% of the time and as such can be regarded as the "average maximum level". Similarly, L ₉₀ is the "average minimum level" and is often used to describe the background noise. It is common practice to use the L ₁₀ index to describe traffic noise.
Free-field Level	A 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 125-millisecond time constant.
Slow	A time weighting used in the root-mean-square section of a sound level meter with a 1000-millisecond time constant.



APPENDIX II

BACKGROUND SOUND LEVEL DATA

TABLE A1 AVERAGE MEASURED AMBIENT AND BACKGROUND SOUND PRESSURE LEVELS – NMP1

MEASUREMENT START TIME	AVERAGE MEASURED AMBIENT SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	AVERAGE MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
13/03/2020 09:56	56.3	52.8
13/03/2020 10:56	54.6	52.4
13/03/2020 11:56	53.2	51.6
13/03/2020 12:56	51.4	48.9
13/03/2020 13:56	53.3	50.2
13/03/2020 14:56	54.3	53.0
13/03/2020 15:56	54.6	52.3
13/03/2020 16:56	56.6	54.4
13/03/2020 17:56	58.2	56.7
13/03/2020 18:56	57.6	55.5
13/03/2020 19:56	55.4	52.9
13/03/2020 20:56	55.7	53.3
13/03/2020 21:56	54.9	52.1
13/03/2020 22:56	53.1	49.9
13/03/2020 23:56	51.2	47.1
14/03/2020 00:56	49.5	45.0
14/03/2020 01:56	47.1	43.2
14/03/2020 02:56	45.5	41.5
14/03/2020 03:56	45.9	43.0
14/03/2020 04:56	49	46.2
14/03/2020 05:56	51.8	49.8
14/03/2020 06:56	53.3	50.8
14/03/2020 07:56	53	50.9
14/03/2020 08:56	52.7	51.2
14/03/2020 09:56	53.2	51.8
14/03/2020 10:56	54.1	52.8
14/03/2020 11:56	54.2	52.8
14/03/2020 12:56	55.3	52.7
14/03/2020 13:56	55	53.7
14/03/2020 14:56	54.7	53.8



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MEASUREMENT START TIME	AVERAGE MEASURED AMBIENT SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	AVERAGE MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
14/03/2020 15:56	55.6	54.6
14/03/2020 16:56	54.8	53.9
14/03/2020 17:56	54.9	53.6
14/03/2020 18:56	53.1	51.9
14/03/2020 19:56	51.8	50.2
14/03/2020 20:56	50.4	49.0
14/03/2020 21:56	51.7	50.2
14/03/2020 22:56	51	49.3
14/03/2020 23:56	50	48.2
15/03/2020 00:56	48.6	45.4
15/03/2020 01:56	48.7	44.9
15/03/2020 02:56	48.2	45.6
15/03/2020 03:56	48.5	46.4
15/03/2020 04:56	51.1	47.0
15/03/2020 05:56	51.9	49.9
15/03/2020 06:56	53	51.4
15/03/2020 07:56	52.4	50.6
15/03/2020 08:56	54.9	52.8
15/03/2020 09:56	56	54.4
15/03/2020 10:56	59.3	57.2
15/03/2020 11:56	60.9	58.9
15/03/2020 12:56	60.8	59.0
15/03/2020 13:56	59.7	57.6
15/03/2020 14:56	59.8	57.7
15/03/2020 15:56	59.9	57.8
15/03/2020 16:56	59.6	57.6
15/03/2020 17:56	58.6	56.6
15/03/2020 18:56	57.7	55.9
15/03/2020 19:56	56.5	54.1
15/03/2020 20:56	55.9	53.1
15/03/2020 21:56	54.5	51.1
15/03/2020 22:56	52.5	48.3
15/03/2020 23:56	51.1	46.1



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MEASUREMENT START TIME	AVERAGE MEASURED AMBIENT SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	AVERAGE MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
16/03/2020 00:56	48.5	42.8
16/03/2020 01:56	47.7	42.5
16/03/2020 02:56	48.2	43.5
16/03/2020 03:56	50.1	46.5
16/03/2020 04:56	56.3	51.8
16/03/2020 05:56	59.4	57.4
16/03/2020 06:56	60.2	58.8
16/03/2020 07:56	57.3	55.9
16/03/2020 08:56	56.2	54.3
16/03/2020 09:56	55.9	53.9
16/03/2020 10:56	53.6	52.1
16/03/2020 11:56	53.8	52.4
16/03/2020 12:56	55.5	53.5
16/03/2020 13:56	56.7	55.2
16/03/2020 14:56	57.2	55.6
16/03/2020 15:56	57.5	56.3
16/03/2020 16:56	58	56.6
16/03/2020 17:56	56.4	55.0
16/03/2020 18:56	53.9	52.5
16/03/2020 19:56	53	51.5
16/03/2020 20:56	52.4	51.0
16/03/2020 21:56	51.3	49.4
16/03/2020 22:56	50.1	47.6
16/03/2020 23:56	49	45.7
17/03/2020 00:56	49.5	46.0
17/03/2020 01:56	48.6	45.3
17/03/2020 02:56	49.3	45.7
17/03/2020 03:56	51.2	48.2
17/03/2020 04:56	55.3	51.4
17/03/2020 05:56	58	55.8
17/03/2020 06:56	59.9	59.1
17/03/2020 07:56	58.1	56.8
17/03/2020 08:56	56.9	55.5



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MEASUREMENT START TIME	AVERAGE MEASURED AMBIENT SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	AVERAGE MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
17/03/2020 09:56	56.7	55.0
17/03/2020 10:56	55.5	53.4

TABLE A2 AVERAGE MEASURED AMBIENT AND BACKGROUND SOUND PRESSURE LEVELS – NMP2

MEASUREMENT START TIME	AVERAGE MEASURED AMBIENT SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	AVERAGE MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
13/03/2020 11:00	53.3	51.1
13/03/2020 12:00	51.3	48.5
13/03/2020 13:00	50.1	46.3
13/03/2020 14:00	54.7	51.2
13/03/2020 15:00	55.6	53.0
13/03/2020 16:00	52.7	50.4
13/03/2020 17:00	54.7	51.4
13/03/2020 18:00	54.5	52.6
13/03/2020 19:00	54.2	51.6
13/03/2020 20:00	52	50.1
13/03/2020 21:00	52.7	50.1
13/03/2020 22:00	52.1	48.6
13/03/2020 23:00	50	46.5
14/03/2020 00:00	47.8	44.4
14/03/2020 01:00	46.7	43.0
14/03/2020 02:00	45.2	42.1
14/03/2020 03:00	44.9	42.1
14/03/2020 04:00	45.2	42.1
14/03/2020 05:00	49.6	45.2
14/03/2020 06:00	51.2	48.2
14/03/2020 07:00	54.1	49.8
14/03/2020 08:00	55.6	51.7
14/03/2020 09:00	56.1	51.9



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MEASUREMENT START TIME	AVERAGE MEASURED AMBIENT SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	AVERAGE MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
14/03/2020 10:00	54.7	51.8
14/03/2020 11:00	56	53.2
14/03/2020 12:00	54.9	52.5
14/03/2020 13:00	56.1	53.8
14/03/2020 14:00	55	52.6
14/03/2020 15:00	55.1	53.0
14/03/2020 16:00	56.1	53.8
14/03/2020 17:00	56.2	53.5
14/03/2020 18:00	56	53.3
14/03/2020 19:00	54.5	51.5
14/03/2020 20:00	53.6	49.7
14/03/2020 21:00	52.2	47.7
14/03/2020 22:00	53.5	49.6
14/03/2020 23:00	52.3	48.1
15/03/2020 00:00	51.4	47.6
15/03/2020 01:00	48.9	44.7
15/03/2020 02:00	48.4	44.2
15/03/2020 03:00	47.9	44.8
15/03/2020 04:00	48	45.4
15/03/2020 05:00	51.3	46.3
15/03/2020 06:00	51.8	49.0
15/03/2020 07:00	52.9	49.8
15/03/2020 08:00	52.7	49.7
15/03/2020 09:00	55.1	52.0
15/03/2020 10:00	56	53.4
15/03/2020 11:00	57.1	55.0
15/03/2020 12:00	58	56.2
15/03/2020 13:00	57.9	55.9
15/03/2020 14:00	57.5	55.2
15/03/2020 15:00	57.4	55.1
15/03/2020 16:00	57	55.0
15/03/2020 17:00	57	54.7
15/03/2020 18:00	55.9	54.1



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MEASUREMENT START TIME	AVERAGE MEASURED AMBIENT SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	AVERAGE MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
15/03/2020 19:00	55.2	53.1
15/03/2020 20:00	54.2	52.0
15/03/2020 21:00	53.3	50.6
15/03/2020 22:00	51.4	48.3
15/03/2020 23:00	49.5	46.3
16/03/2020 00:00	48.3	44.7
16/03/2020 01:00	46.8	43.4
16/03/2020 02:00	45.7	42.6
16/03/2020 03:00	45.9	42.8
16/03/2020 04:00	48.2	44.8
16/03/2020 05:00	58.4	50.8
16/03/2020 06:00	58.1	55.8
16/03/2020 07:00	59.5	57.7
16/03/2020 08:00	57.1	55.0
16/03/2020 09:00	55.9	53.8
16/03/2020 10:00	55.5	52.7
16/03/2020 11:00	54.7	52.4
16/03/2020 12:00	54.3	52.5
16/03/2020 13:00	56.7	53.7
16/03/2020 14:00	57.7	55.1
16/03/2020 15:00	58.7	56.0
16/03/2020 16:00	58.3	56.2
16/03/2020 17:00	58	55.6
16/03/2020 18:00	56.8	53.6
16/03/2020 19:00	53.5	51.0
16/03/2020 20:00	52.8	49.9
16/03/2020 21:00	52.5	49.9
16/03/2020 22:00	51.5	48.3
16/03/2020 23:00	49.5	46.1
17/03/2020 00:00	48.4	44.4
17/03/2020 01:00	48	44.5
17/03/2020 02:00	47.5	44.0
17/03/2020 03:00	47.9	44.5



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Noise Impact Assessment

October 2022

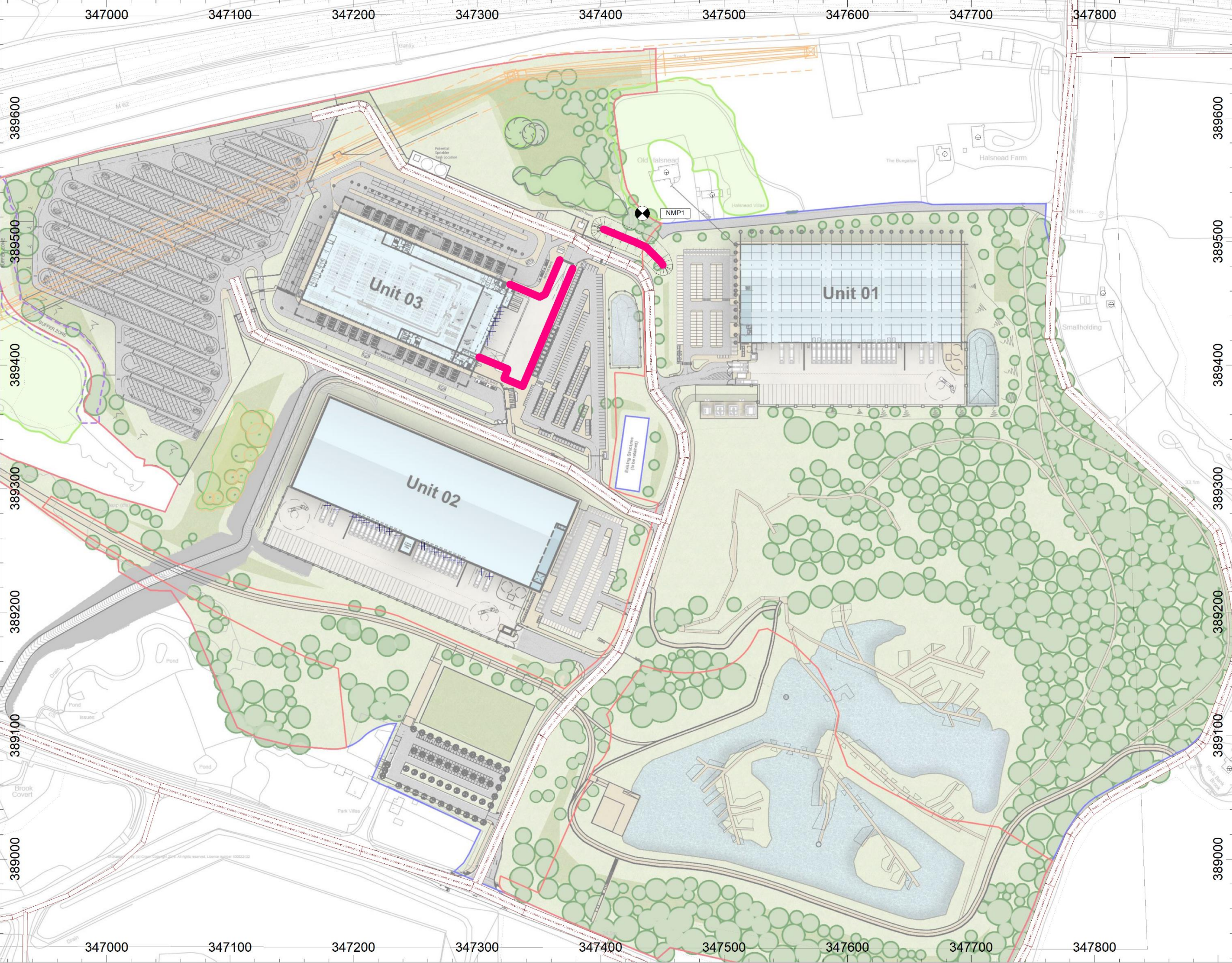
MEASUREMENT START TIME	AVERAGE MEASURED AMBIENT SOUND LEVEL, $L_{Aeq,1hr}$ (dB)	AVERAGE MEASURED BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)
17/03/2020 04:00	50	46.5
17/03/2020 05:00	55.4	50.1
17/03/2020 06:00	56.9	54.5
17/03/2020 07:00	60	58.3
17/03/2020 08:00	58.5	56.6
17/03/2020 09:00	57.2	55.0
17/03/2020 10:00	57.3	54.4
17/03/2020 11:00	56.4	53.2



APPENDIX III

FIGURES

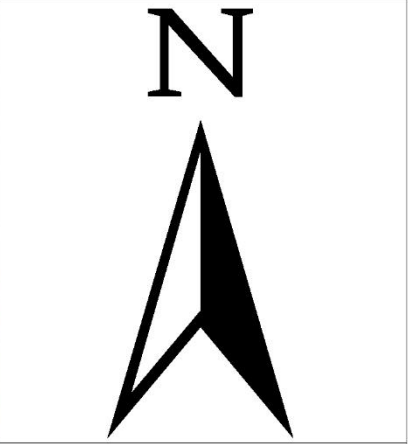
Figure 1 - Noise Survey Measurement Positions



Project:
Symmetry Park Merseyside
Phase 2 Reserved Matters

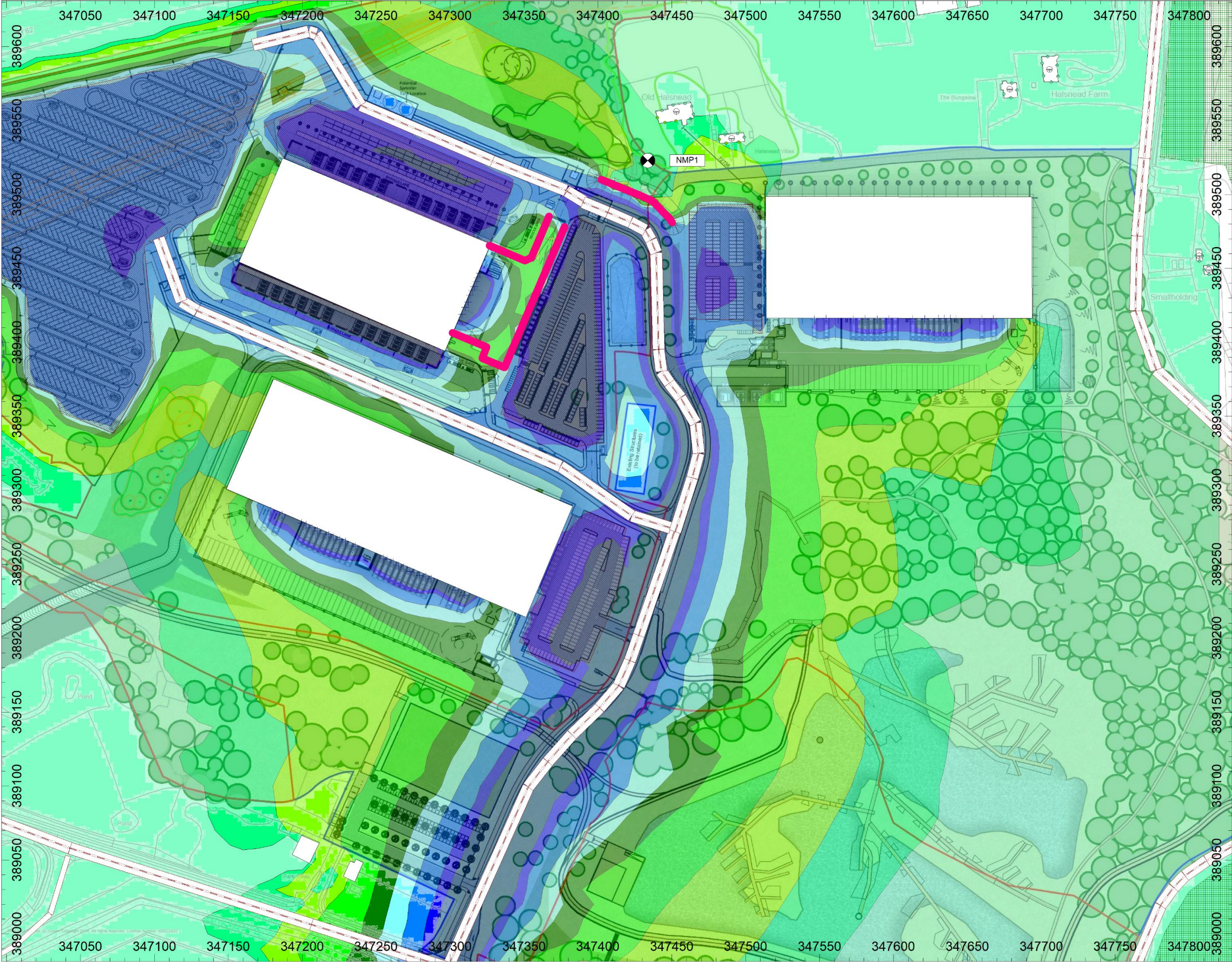
Project-No:
50-356

Client:
Tritax Symmetry Huyton Ltd



Project Engineer: L Faulkner
Date: 21/10/2022

Figure 2 - Daytime Commercial Sound Grid Noise Map - Calculation at 1.5 m above ground level



Project:
Symmetry Park Merseyside
Reserved Matters

Project-No:
50-575

Client:
Tritax Symmetry Huyton Ltd

**Specific Noise Level,
LAeq,T (dB)**

...	<= 40
40 < ...	<= 42
42 < ...	<= 45
45 < ...	<= 48
48 < ...	<= 50
50 < ...	<= 52
52 < ...	<= 55
55 < ...	<= 58
58 < ...	

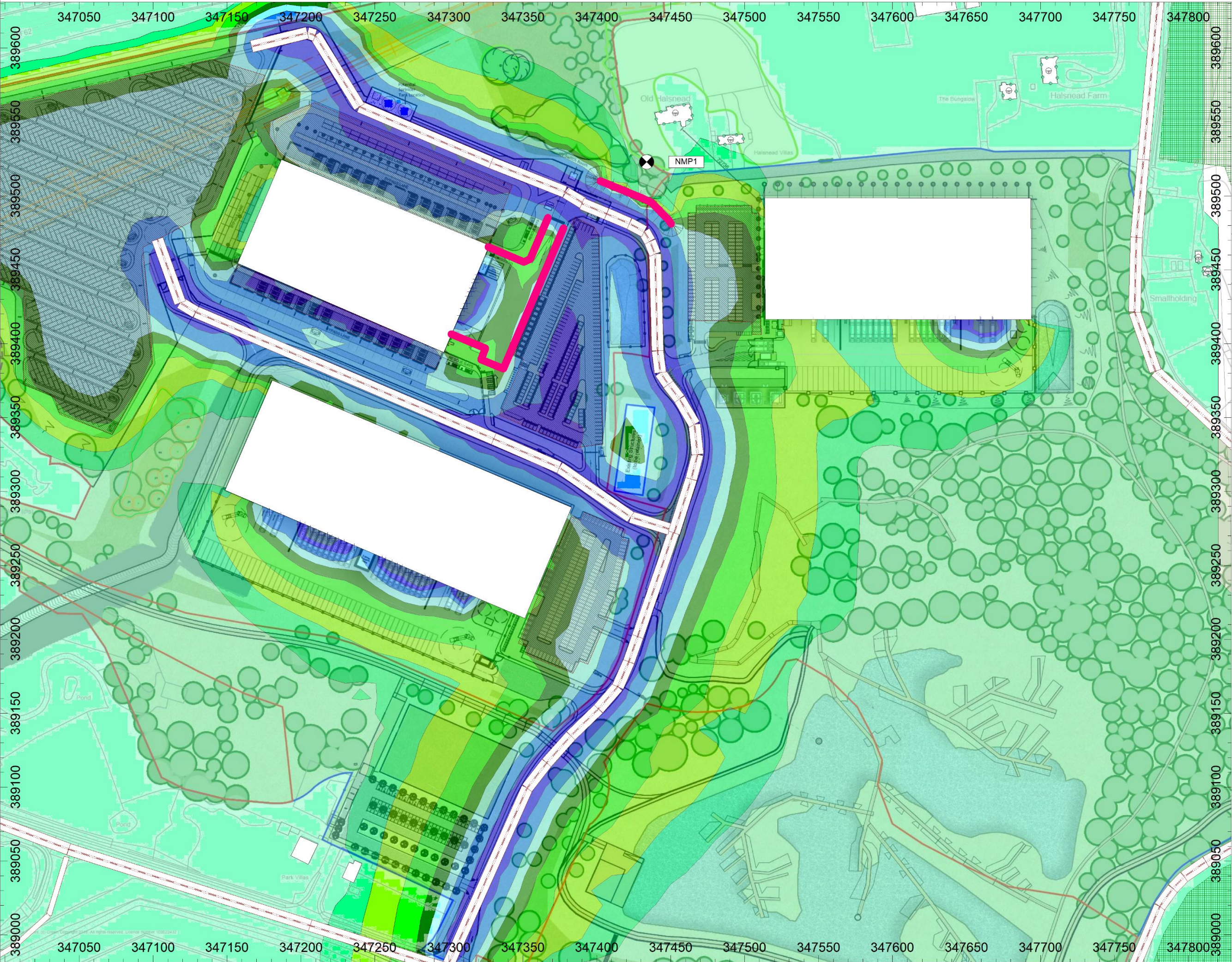
Noise Map Objects

- + Point Source
- Line Source
- Road
- Parking Lot
- Building
- Barrier
- Embankment
- Foliage
- Contour Line
- Receiver
- Building Evaluation
- Calculation Area



Project Engineer: Lee Faulkner
Date: 21/10/2022

Figure 3 - Night-time Commercial Sound Grid Noise Map - Calculation at 4 m above ground level



Project:
Symmetry Park Merseyside
Reserved Matters

Project-No:
50-575

Client:
Tritax Symmetry Huyton Ltd

**Specific Noise Level,
LAeq,T (dB)**

- ... ≤ 40
- $40 < \dots \leq 42$
- $42 < \dots \leq 45$
- $45 < \dots \leq 48$
- $48 < \dots \leq 50$
- $50 < \dots \leq 52$
- $52 < \dots \leq 55$
- $55 < \dots \leq 58$
- $58 < \dots$

Noise Map Objects

- + Point Source
- Line Source
- Road
- Parking Lot
- Building
- Barrier
- Embankment
- Foliage
- Contour Line
- Receiver
- Building Evaluation
- Calculation Area



Project Engineer: Lee Faulkner
Date: 21/10/2022