PHA
Paul Horsley Acoustics Ltd
Acoustics & Noise Control Consultancy

Acoustic Report

Boundary Fence Acoustic Performance Noise Assessment
Harrison Croft, Station Road, Gilberdyke, HU15 2SU
Planning Application 22/03368/VAR

Our Reference – J3223

Revision - 0

Report by – Paul Horsley MIOA

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Limitations

The assessments and interpretation have been made in line with legislation and guidelines in force at the time of writing, representing best practice at that time.

All of the comments and opinions contained in this report, including any conclusions, are based on the information obtained by Paul Horsley Acoustics Ltd during our investigations.

There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been considered by this report. Responsibility cannot be accepted for conditions not revealed by the investigation.

Any diagram or opinion of the possible configuration of the findings is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

Except as otherwise requested by the Client, Paul Horsley Acoustics Ltd is not obliged and disclaims any obligation to update the report for events taking place after:

a) the date on which this assessment was undertaken; and
b) the date on which the final report is delivered.

Paul Horsley Acoustics Ltd makes no representation whatsoever concerning the legal significance of its findings or to other legal matters referred to in the following report.

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1.0 Client

Orion Homes Ltd
5 Benton Office Park
Bennett Avenue
Horbury
Wakefield
WF4 5RA

2.0 Site Address

Harrison Croft, off Station Road, Gilberdyke, East Riding of Yorkshire, HU15 2SU.

3.0 Subject

Variation of Condition 18 (acoustic fence) of planning permission 20/00937/VAR (Erection of 29 dwellings and associated access road) to allow for alternative fencing.

Condition No 18 states the following:

> No dwelling shall be occupied until a 2m high Jakoustic Barrier System fence has been installed along the southern boundary of the site in accordance with the details shown on drawing 6293/002 by Orion Homes received 18.07.2018 and approved under application 17/30062/CONDET, and the fence shall thereafter be so retained.

4.0 Aims

The aim of this report is to provide additional test data to inform the Local Authority of the validity and acceptability of the installed alternative fencing along the southern boundary of the site adjacent to the railway line.

Show through noise monitoring that the alternative fence provides a similar acoustic sound transmission performance to the approved Jakoustic Barrier System and that the barrier effect achieves the guidance noise limits of BS8233:2014 within the gardens of the built premises.

5.0 Location and Description of Existing Noise Sources

The development site under consideration is positioned on land to the west of 56 Station Road, Gilberdyke, Brough in the East Riding of Yorkshire.

The development includes 29 No residential dwellings. Access to the site is from Station Road via a formed road to the north of the site. The site is best described as triangular in shape.

The site is positioned on flat land and is bounded to the north by existing residential premises and a recreational pond. The southern site boundary is formed by Gilberdyke Junction railway and signal box, leading to Gilberdyke Station to the east on the opposite side of Station Road. The railway platform is an un-manned station serving the Northern Rail railway system running between Hull and Sheffield / Doncaster, having a platform and pedestrian bridge over the line. Beyond the railway station is a substantial industrial area. The eastern site boundary is formed by Station Road, however, the road branches with the site boundary road providing access to Gilberdyke Station and parking area for up to 10 vehicles and the main Station Road continuing up and over the railway line to the industrial area beyond.

The primary noise source within the vicinity of the southern site boundary is due to diesel powered train movements, either, passing through or stopping at the Gilberdyke Station. Between train movements traffic, birdsong and aircraft are the dominant noise sources.

Scheduled trains operate on the railway line past the site between 06.00 to 00.00 daily with no scheduled nighttime operations.

6.0 Guidance on the Assessment of Noise Levels

The Local Authority have been contacted relating to the methodology to be used to assess the effectiveness of the alternative boundary fence.

It was agreed that the following would be considered.

6.1 Calculation of Railway Noise (CRN) 1995

The Calculation of Railway Noise (CRN) provides details of the methodology for assessing noise exposure at a dwelling due to train passage noise.

It provides information on the physical conditions and criteria that should be met to complete a valid monitoring execution. These include:

- Rail ballast-bed must be dry but not frozen.
- Rails must be dry.
- Average wind speed (at height of 1.5m): must not exceed 2m/s in the direction from the rail to reception point.
- Max wind speed noise at the microphone should be 10 dB or more below the measured/anticipated value of LAMax dB.

It goes on the detail when it is a valid period to complete measurements. These include:

- When there is a flow of trains along the line. Stationary trains and other vehicles are not to be included.
- When standard railway traffic data indicates predictability of train types and times.
- When the trains run on steel rails.
- When physical conditions allow (See above).

CRN goes on to indicate the prescribed measurement method. Noted below:

- Measurements are used for the purpose of Railway Noise Regulations, where there is no other significant noise source in the area.
- Time periods: 0600 – 2400, daytime (Q-day) and / or 0000 – 0600, nighttime (Q-night), whichever is appropriate, depending upon train movements.
- The purpose of the measurements is to establish a LAeq dB based upon separate measurements of individual train noise based on either or both of the time periods.
- Each individual train noise is measured in SEL, so to obviate other contemporaneous noise sources. A calculation is then made to establish the LAeq dB value.

CRN provides the calculation formula to allow conversion of the monitored SEL dB train noise to determine the LAeq, $_{18\text{-hour}}$ (Daytime) and LAeq, $_{6\text{-hour}}$ (Nighttime) values.

6.2 British Standard 8233:2014

The scope of British Standard 8233: 2014: *Sound insulation and noise reduction for buildings* is the provision of guidance for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations; the primary intention of these is to guide the design of new buildings or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate.

The standard suggests suitable internal noise levels within different types of buildings, including residential dwellings, as shown in Table below.

Indoor Ambient Noise Levels in Spaces When They Are Unoccupied

Activity	Typical Situations	Design Range LAeq, T dB	
		0700h to 2300h	2300h to 0700h
Resting	Living rooms	35	--
Dining	Dining Room / Area	40	--
Sleeping	Bedrooms	35	30

BS8233 states in Note 4 that:

"Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values."

As such it has been considered appropriate to define a limit for regular maximum indoor noise levels of 45 dB(A) with sporadic events not exceeding 50 dB(A).

BS8233 also suggests noise limits for external areas for a property such as gardens or balconies. It states that:

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

values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centre's or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited.'

Since we are dealing with railway noise and a boundary fence, the external garden area will be the determining factor within this report, with the upper limit providing the design target, due to the close proximity of the gardens to the nearby railway lines.

7.0 Survey Equipment

Svantek Sound and Vibration Analyser, SVAN 979, Type 1, Serial No 92932, Calibration Date 10.08.23
Svantek Preamplifier, SV 17 Microphone Serial No 106523, Calibration Date 10.08.23
GRAS Pre-Amplifier, Type GRAS 40AE, Serial No 370153
RION NC-74 Calibrator Serial No 530712, Calibration Date 25.01.23
Windshield
Tripod
Microphone Extension Boom
Cabling

Refer to Appendix B for current calibration certification details.

8.0 Survey Method

The assessment methodology was discussed and agreed with the Local Authorities Environmental Health Officer, Julie Willder. Below is a redacted copy of the email received that forms the basis of the assessment completed.

To Paul Horsley
Cc Candy Day; Calum Rowley; Hannah Taylor
Mon 17/04/2023 15:
You replied to this message on 18/04/2023 08:58.

To: Paul Horsley <paulhorsleyacoustics@outlook.com>
Cc: Candy Day [redacted]
Subject: RE: J3171 - Land West of Craig House 56 Station Road Gilberdyke - 22/03368/VAR

Hi Paul,

Thank you for your email. I have a few suggestions in regards to the noise assessment:

I would like to understand from your report what the performance is of the replacement fence and the report should refer to BS8233:2014 'Guidance on sound insulation and noise reduction for buildings', the gardens should ideally not exceed the upper guidance noise level of 55dB LAeq,16hr 07:00 to 23:00hr.

Before the assessment is carried out it would be preferable if you provided a location plan with your intended measurement points that we can agree between us. I would suggest considering more than one location to take measurements for the acoustic fence, in order to show representation of the whole fence. You may want to contact those who have objected to the variation on the planning portal and with permission, take measurements from their gardens.

I would expect the methodology within the Calculation of Railway Noise (CRN) 1995 to be used to evaluate the railway noise. In my opinion, there should be a number of trains passing during the assessment period as it is a busy line, so hopefully there will not be any need for the alternative method using a specific constant sound source. If you do have to resort to this, we would expect justification in the report.

Details of the equipment used, calibration evidence, meteorological conditions etc will naturally be included.

I look forward to hearing from you.

Kind regards

Julie Willder
Environmental Health Officer
www.eastriding.gov.uk

EAST RIDING OF YORKSHIRE COUNCIL

Access to the southern garden areas of the residents adjacent to the railway lines is only possible via the residents premises. Therefore, the additional noise monitoring agreed that 4 No resident gardens would be utilised along the southern boundary, these being No 12, 15, 17 and 18 Harrison Croft.

Noise monitoring was completed on 31st October 2023 during daytime periods between 10.00 and 18.00.

The equipment was set upon within the relevant garden to record background data, including train passages, for a period of 1-hour. LAeq dB and SEL dB data was recorded using a 1 sec data stamp for the monitoring period. The microphone was located on a tripod at a height of 1.6m above the ground at 2m from the southern boundary fence. The sound level meter was set to record a 1/1 Octave Centre Band analysis.

Once the initial monitoring was complete additional train noise was recorded. The sound level meter was mounted on a tripod with the microphone located on the extension boom 1m above the southern boundary fence. The sound level meter was again set to record LAeq dB and SEL dB data, along with 1 /1 Octave Centre Band frequency data.

The fence SRI was assessed by placing the microphone 1m from the railway side of the fence and recording a train passage, then placing the microphone on the receiver side of the fence and recording the data of the same passing train. This ensured that the same noise source was recorded at both sides of the fence to allow determination of the acoustic properties.

The sound level meter was field calibrated before and after each monitoring session. No drift in calibration was noted between checks.

The monitoring sessions noted above were completed for all 4 No residential premises noted.

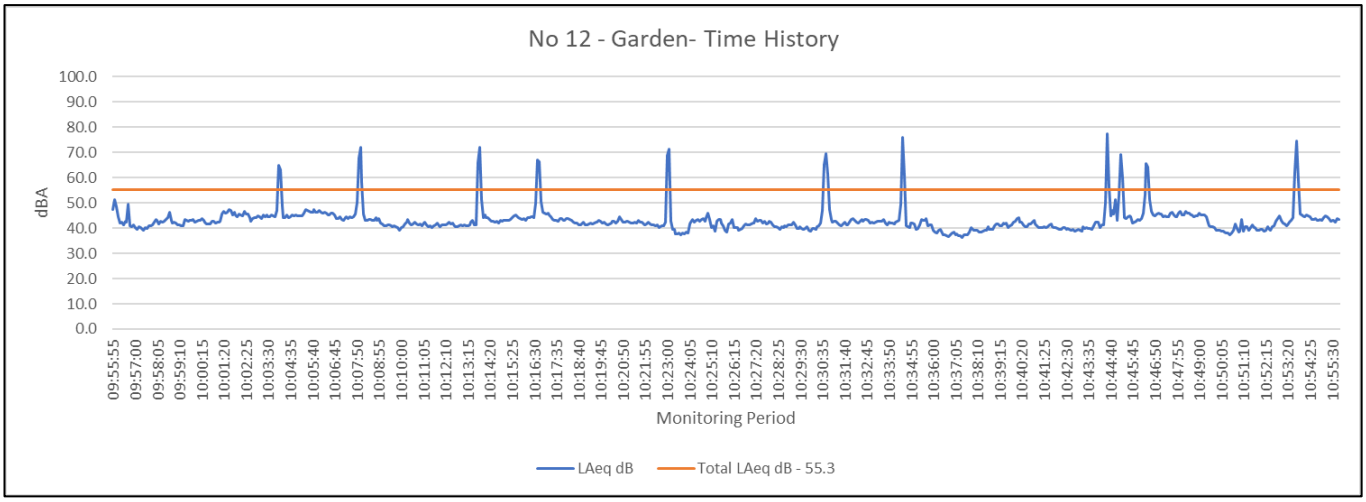
9.0 Prevailing Weather Conditions

31st October 2023 - 10°C, 100% cloud cover, wind SW 0-2mph, 96% rh, 1000 mb.

10.0 Noise Survey Results

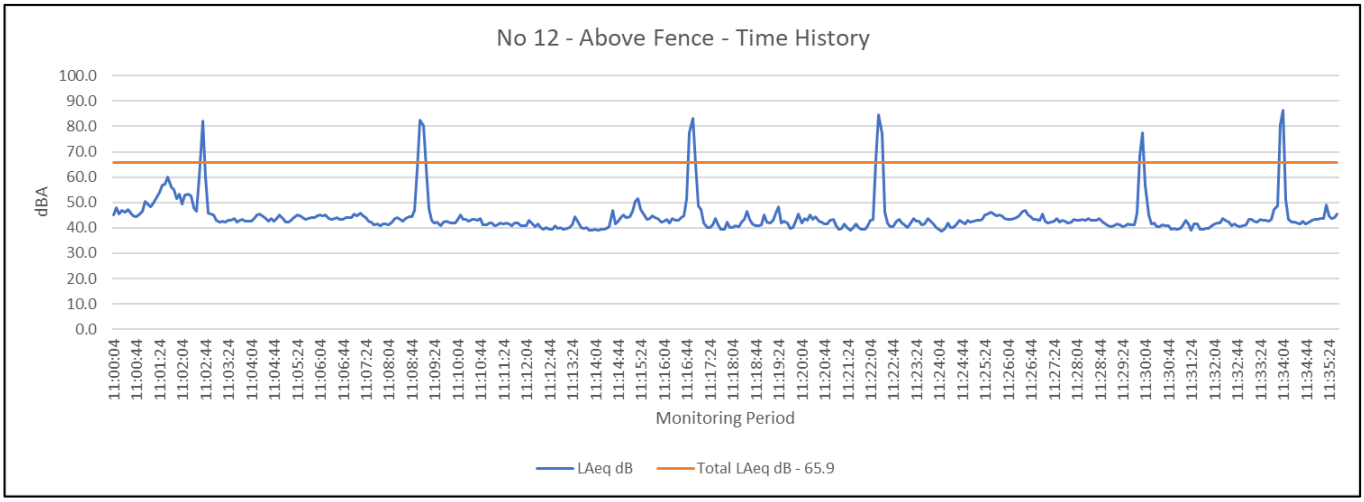
The following tables provide details of the noise level results from the monitoring sessions completed for train noise associated with the southern site boundary fence pertaining to the Harrison Croft premises.

10.1.1 Session 1 – 12 Harrison Croft – Garden - Time History Graph



Graph showing the LAeq dB noise sources and events recorded inside the garden.

10.1.2 Session 1 – 12 Harrison Croft – Above Fence Line - Time History Graph



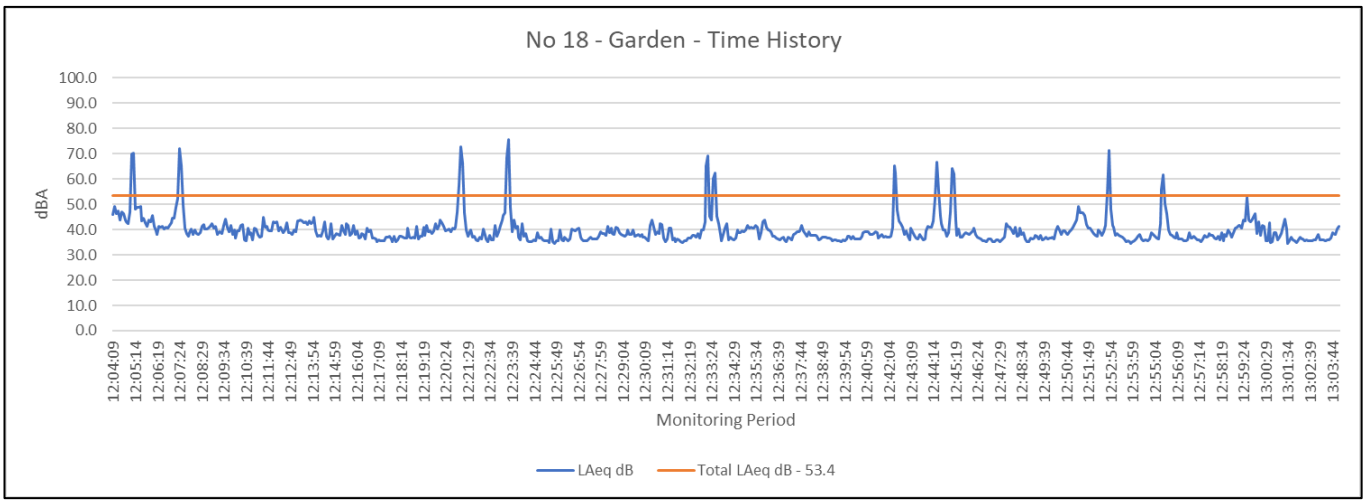
10.1.3 Session 1 – 12 Harrison Croft SEL dB Data

No 12 - CRN Noise Monitoring Data						
Start date & time	**Passage Duration**	**LAE(SEL) dB**	**LAeq dB**	**Description**	**No Carriages**	**Direction**
12:01:59	00:00:23	82.6	74.9	Slow regional train	2	W
12:10:58	00:00:38	85.2	73.2	Slow regional train	2	W
12:16:59	00:00:32	87.2	73.8	Fast regional train	2	W
12:22:21	00:00:26	88.0	77.0	Fast regional train	3	E
12:30:11	00:00:32	85.0	73.0	Slow regional train	3	W
12:34:17	00:00:28	89.1	78.8	Fast regional train	4	E

10.1.4 Session 1 – 12 Harrison Croft - Boundary Fence SRI Results Table

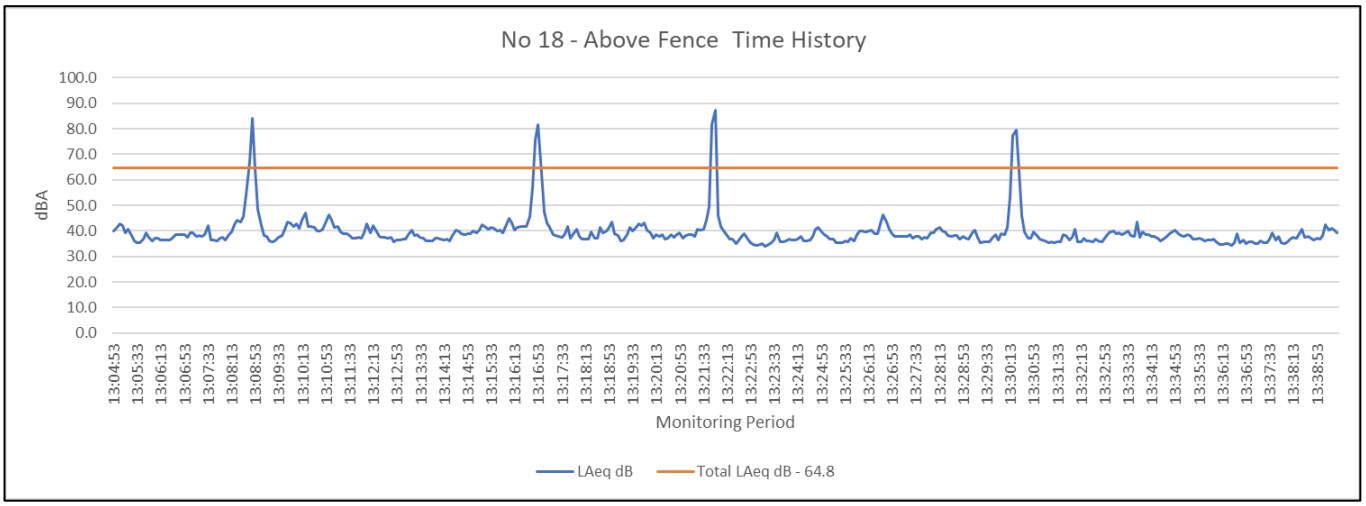
Acoustic Screen Sound Transmission Assessment - No 12									
Position	**LAeq dB**	**Linear Leq dB Value in Frequency Band Hz**							**Comments**
		63 Hz	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**8000 Hz**
Source Side	80.8	78	81	80	73	75	76	69	61	Source dominant sound
Receiver Side	54.5	65	59	59	49	48	45	40	31	Opposite side of fence at 1m
Assessed Screen Attenuation	**26.3**	**13**	**22**	**21**	**24**	**27**	**31**	**29**	**30**	**Direct Transmission Through Barrier**

10.2.1 Session 2 – 18 Harrison Croft – Garden - Time History Graph



Graph showing the LAeq dB noise sources and events recorded inside the garden.

10.2.2 Session 2 – 18 Harrison Croft – Above Fence Line - Time History Graph



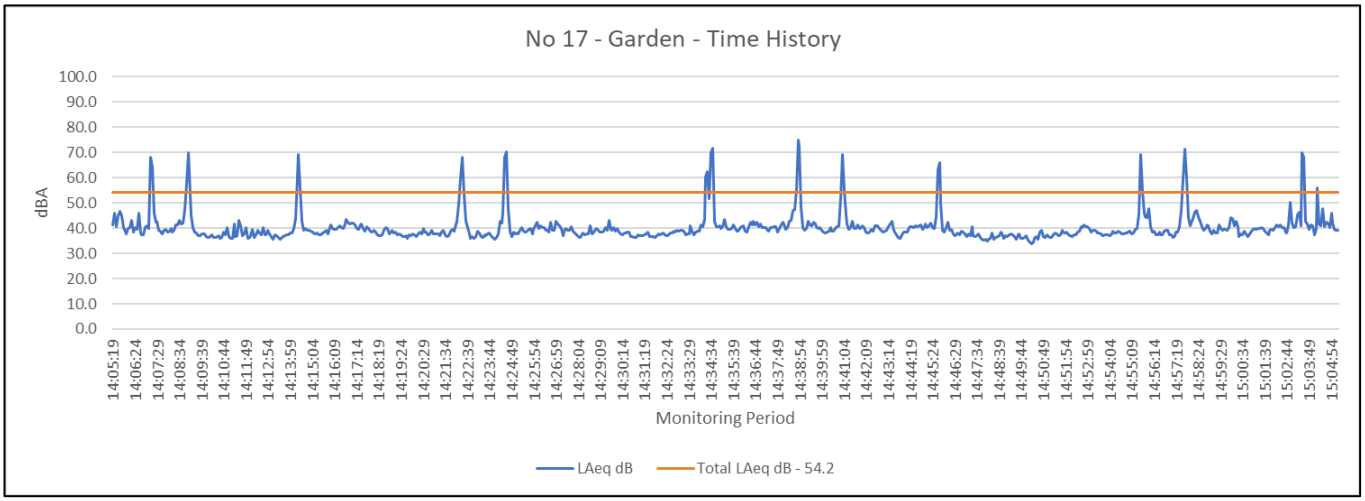
10.2.3 Session 2 – 18 Harrison Croft SEL dB Data

No 18 - CRN Noise Monitoring Data						
Start date & time	**Passage Duration**	**LAE(SEL) dB**	**LAeq dB**	**Description**	**No Carriages**	**Direction**
13:08:38	00:00:30	86.2	75.0	Fast regional train	3	E
13:16:54	00:00:28	88.8	76.8	Fast regional train	2	W
13:21:53	00:00:26	89.2	81.2	Slow regional train	2	E
13:30:23	00:00:36	87.3	75.2	Slow regional train	3	W

10.2.4 Session 2 – 18 Harrison Croft - Boundary Fence SRI Results Table

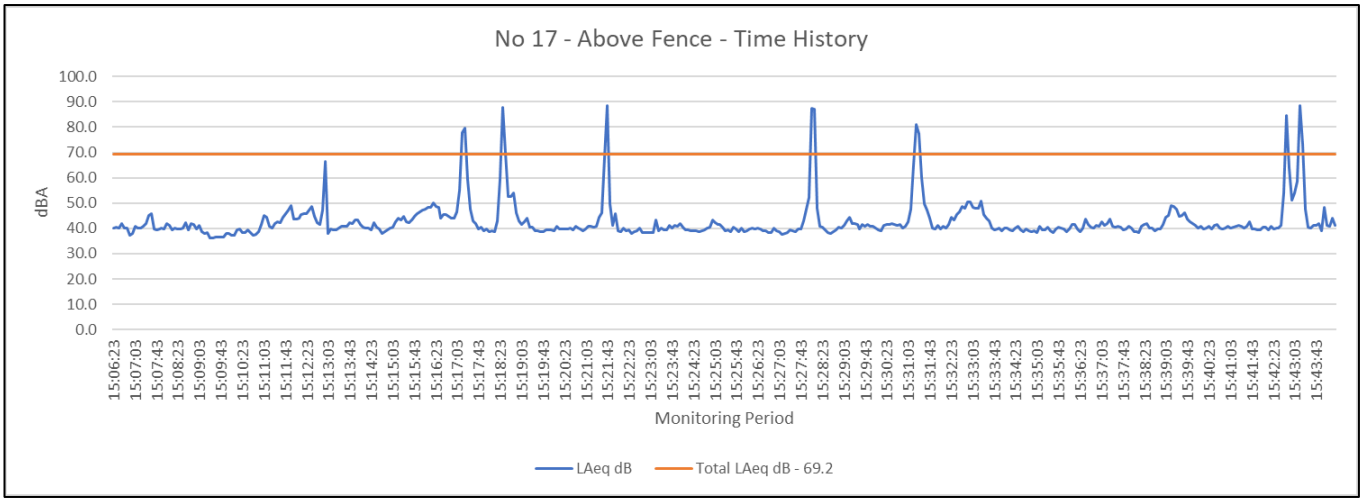
Acoustic Screen Sound Transmission Assessment - No 18									
Position	LAeq dB	Linear Leq dB Value in Frequency Band Hz							Comments
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	
Source Side	88.5	89	90	87	86	84	81	76	69	Source dominant sound
Receiver Side	60.3	74	67	64	61	56	49	46	38	Opposite side of fence at 1m
Assessed Screen Attenuation	**28.2**	**15**	**23**	**23**	**25**	**28**	**32**	**30**	**31**	**Direct Transmission Through Barrier**

10.3.1 Session 3 – 17 Harrison Croft – Garden - Time History Graph



Graph showing the LAeq dB noise sources and events recorded inside the garden.

10.3.2 Session 3 – 17 Harrison Croft – Above Fence Line - Time History Graph



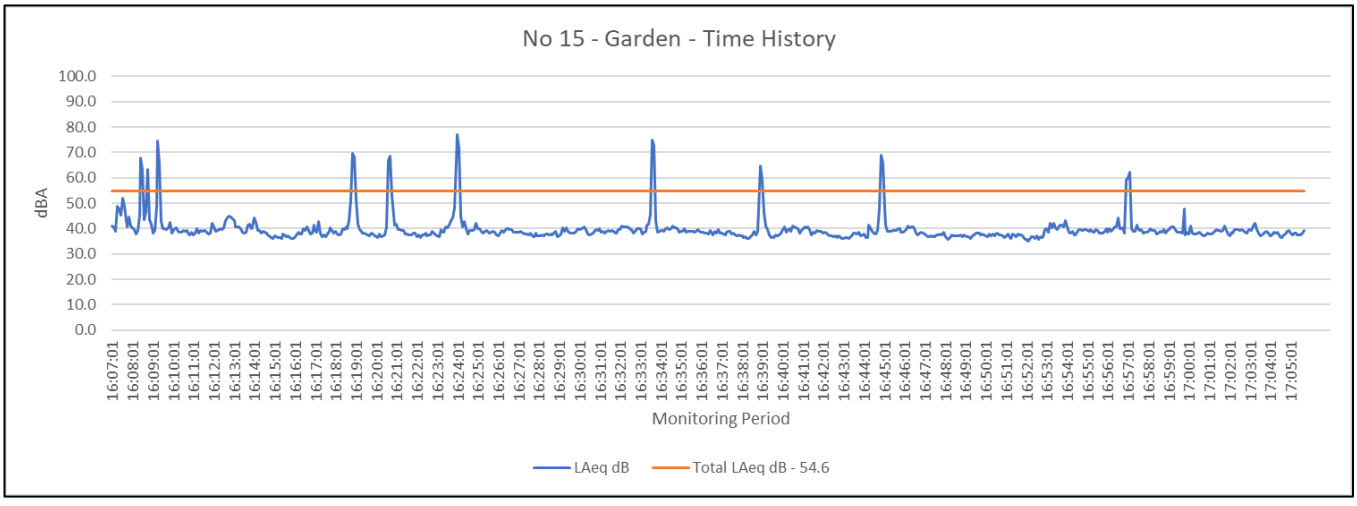
10.3.3 Session 3 – 17 Harrison Croft SEL dB Data

No 17 - CRN Noise Monitoring Data						
Start date & time	**Passage Duration**	**LAE(SEL) dB**	**LAeq dB**	**Description**	**No Carriages**	**Direction**
15:17:18	00:00:32	85.7	72.3	Fast regional train	3	W
15:18:28	00:00:24	87.8	74.5	Fast intercity train	6	E
15:21:43	00:00:33	89.3	77.3	Slow regional train	3	E
15:28:08	00:00:36	87.8	75.8	Slow regional train	2	E
15:31:18	00:00:36	81.2	68.2	Slow regional train	2	W
15:42:48	00:00:22	86.2	73.8	Fast regional train	2	W
15:43:13	00:00:22	89.5	76.3	Fast regional train	3	E

10.3.4 Session 3 – 17 Harrison Croft - Boundary Fence SRI Results Table

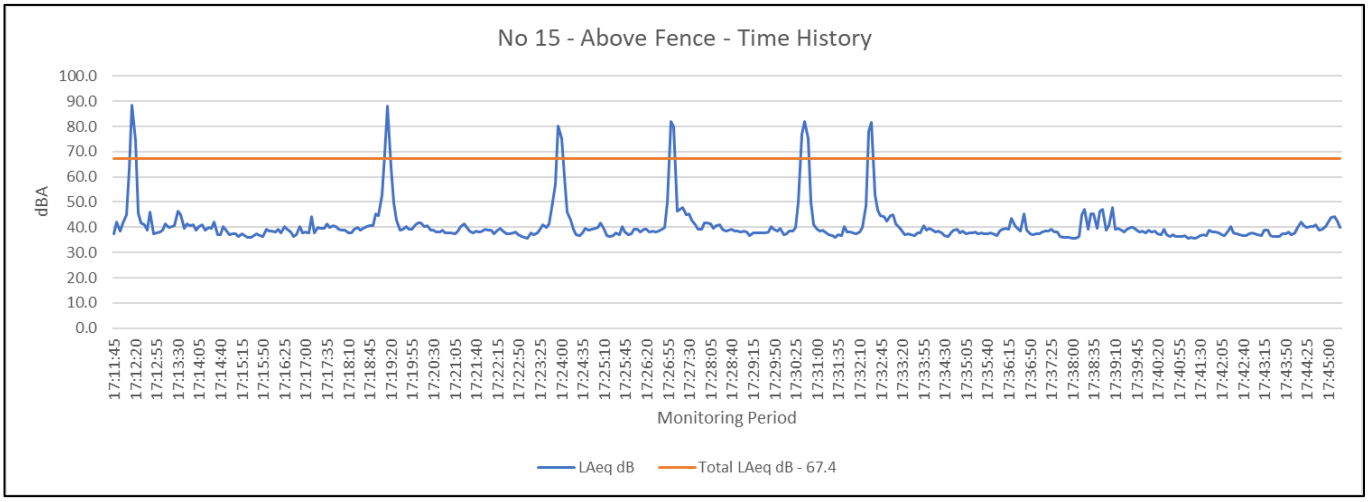
Acoustic Screen Sound Transmission Assessment - No 17									
Position	**LAeq dB**	**Linear Leq dB Value in Frequency Band Hz**							**Comments**
		63 Hz	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**8000 Hz**	
Source Side	77.6	75	79	74	72	71	68	63	56	Source dominant sound
Receiver Side	50.1	63	57	52	47	43	36	34	25	Opposite side of fence at 1m
Assessed Screen Attenuation	**27.5**	**13**	**22**	**22**	**25**	**28**	**32**	**29**	**31**	**Direct Transmission Through Barrier**

10.4.1 Session 4 – 15 Harrison Croft – Garden - Time History Graph



Graph showing the LAeq dB noise sources and events recorded inside the garden.

10.4.2 Session 4 – 15 Harrison Croft – Above Fence Line - Time History Graph



10.4.3 Session 4 – 15 Harrison Croft SEL dB Data

No 15 - CRN Noise Monitoring Data						
Start date & time	**Passage Duration**	**LAE(SEL) dB**	**LAeq dB**	**Description**	**No Carriages**	**Direction**
17:12:15	00:00:26	88.2	78.8	Fast regional train	3	E
17:19:15	00:00:24	87.9	76.5	Slow regional train	3	E
17:23:55	00:00:26	83.9	71.5	Slow regional train	2	W
17:27:00	00:00:22	89.1	77.5	Fast regional train	2	E
17:30:40	00:00:28	86.9	75.3	Fast regional train	2	E
17:32:31	00:00:28	85.1	74.7	Slow regional train	3	W

10.4.4 Session 4 – 15 Harrison Croft - Boundary Fence SRI Results Table

Acoustic Screen Sound Transmission Assessment - No 15										
Position	**LAeq dB**	**Linear Leq dB Value in Frequency Band Hz**								**Comments**
		63 Hz	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**8000 Hz**	
Source Side	77.5	73	78	76	71	72	72	68	58	Source dominant sound
Receiver Side	51.5	60	57	55	45	45	41	39	28	Opposite side of fence at 1m
Assessed Screen Attenuation	**26.0**	**13**	**21**	**21**	**26**	**27**	**31**	**29**	**30**	**Direct Transmission Through Barrier**

11.0 Results Analysis

The above noise surveys were conducted on 31st October 2023, chosen as a representative weekday period to reflect the typical noise climate produced by train passages.

The noise survey results obtained can, therefore, be deemed to be representative of normal train activities for the area and will be used as the base for the CRN analysis and assessment purposes below.

Assessments of the individual results indicate that the monitoring positions selected are affected primarily by train movements passing through or stopping at the nearby Gilberdyke railway station. The current timetable indicates that trains serve or pass through the station between 06:00 to 00.00 daily. Birdsong and traffic movements were also audible during assessment periods between train passage noise.

Session No 1 to 4 were conducted inside the gardens of the residential premises lining the railway to the south of the properties. Monitoring was completed with the microphone recording internal garden levels over a 1-hour period in each of the 4 No properties to determine the residential exposure within the gardens. Additional monitoring was completed with the microphone above the fence line of the garden to determine the actual noise levels at the residential perimeter excluding boundary fence reduction to allow CRN details two be calculated.

The data gathered has been deemed adequate to complete a CRN calculation, from which the southern acoustic boundary fence appraisal can be determined. During the assessment no freight trains passed along the railway line, however, previously recorded information will be used for assessment purposes.

12.0 CRN Calculations

The Calculation of Railway Noise (CRN) 1995 allows for determination of the noise associated with train passage for daytime and nighttime periods, whichever is applicable to the location under consideration.

CRN provides the calculation formula to allow conversion of the monitored SEL dB train noise to determine the $L_{Aeq,\ 18\text{-hour}}$ (Daytime) between 06.00 to 00.00 hours and $L_{Aeq,\ 6\text{-hour}}$ (Nighttime) between 00.00 to 06.00 hours values.

The trains using the Gilberdyke lines only run during the daytime periods, therefore, no nighttime considerations are being made within this report.

The formula provided to determine the LAeq, $_{18\text{-hour}}$ dB values are based upon a conversion of the recorded SEL values and the number of train passages for each train type using the specific railway lines under consideration.

The conversion formula is as follows.

LAeq, $_{18\text{-hour}}$ = SEL – 48.1 + 10 Log 10 QDAY, dBA

Where

SEL = Single Event Level, dBA

QDAY = Number of a specific rain types passing per daytime period between 06.00 to 00.00

For reference the train types will be categorised into 3 No types.

- Fast Passenger Trains
- Slow Passenger Trains
- Freight Trains

The CRN calculation assesses the number of each train type, based upon the witnessed passage numbers over the monitoring periods considered. The numbers were verified with the occupant of No 15 during the assessment period.

From the results data appearing in Section 10, it is now possible to complete a thorough CRN calculation to determine the overall un-mitigated period exposure at the premises gardens.

CRN Assessment Calculation			
Train Numbers	Train Designation		
	SLOW	HIGH SPEED	FREIGHT
1	82.6	87.2	85.2
2	85.2	88	-
3	85.0	89.1	-
4	89.2	86.2	-
5	87.3	88.8	-
6	89.3	85.7	-
7	87.8	87.8	-
8	81.2	86.2	-
9	87.9	89.5	-
10	83.9	88.2	
11	85.1	89.1	
12		86.9	
Arithmetic Average	85.9	87.7	85.2
Assessment Constant	-48.1	-48.1	-48.1
Assessed Train Passages per 18 hour daytime period 06.00 to 00.00 (Q)	144	36	10
10 Log (Q day)	21.6	15.6	10.0
Resultant daily contribution, dBA	59.3	55.2	47.1
Daily Train Contribution Total - Daytime	**60.9 LAeq 18-hour dB**		

13.0 Acoustic Barrier Assessment

The resultant daily train contribution value calculated for the garden areas of Harrison Croft, Station Road, Gilberdyke is based upon an un-mitigated value, without any boundary fencing.

To determine the effectiveness of the southern site boundary fence, it is necessary to calculate the barrier effect of the fence that has been installed.

The train passage noise contribution and effectiveness of the boundary fence are frequency dependent.

Using the recorded data for the passage of a typical train, we can determine the octave band frequency and from this we can make an adjustment accordingly to arrive at a calculated frequency contribution that replicates the overall CRN LAeq, $_{18\text{-hour}}$ dB value assessed.

Below is a table to determine the frequency value for the overall single figure CRN contribution value.

Position	LAeq dB	Linear Leq dB Value in Frequency Band Hz								Comments
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	
Train Passage Source	77.5	72.6	77.7	76.0	71.4	71.6	72.0	68.2	58.2	Directly monitored results frequency data
Adjustment to CRN Value	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6	Adjustment to achieve CRN Value
Receiver Side	**60.9**	**56**	**61**	**59**	**55**	**55**	**55**	**52**	**42**	**Adjusted CRN Frequency Value for use in barrier calculation**

We can now make use of the frequency data, determined for the train passage, and complete a barrier attenuation calculation. To ensure compatibility with the initial planning noise survey report details, the exact values for the assessment of distance from source to barrier, barrier to recipient and barrier height will be replicated in the barrier calculation.

Below is a copy of the calculation completed for the barrier effect of the alternative acoustic fence installed at the southern boundary of the Harrison Croft, Station Road, Gilberdyke premises.

Project: Harrison Croft, Gilberdyke - Alternative Fence

Freq, Hz	63	125	250	500	1k	2k	4k	8k
Un-Mitigated Train Contribution	56	61	59	55	55	55	52	42

POSITIVE SCREEN

Source to Barrier	12	
Barrier to Receiver	3	(estimated distance to receiver)
Barrier Height	2	
Source Height	2	
Receiver Height	1.6	(direct line of sight assumed between source & receiver)
Path Difference	0.02	

Attenuation due to Screens

Path Difference	63	125	250	500	1k	2k	4k	8k
-0.30	1	0	0	0	0	0	0	0
-0.20	2	1	0	0	0	0	0	0
-0.10	3	2	1	0	0	0	0	0
-0.05	3	3	2	1	0	0	0	0
-0.01	4	4	4	3	3	2	1	1
0.00	5	5	5	5	5	5	5	5
0.01	5	6	6	6	7	8	8	8
0.05	7	7	8	9	10	12	13	13
0.10	7	8	9	10	11	14	16	16
0.20	8	9	10	11	14	16	19	19
0.30	8	9	10	13	16	18	20	20
0.40	9	10	12	14	17	20	22	22
0.50	9	10	12	15	18	20	23	23
1.00	11	12	14	18	20	23	25	25
2.00	14	15	18	20	24	27	29	29
3.00	15	17	20	22	25	28	30	30
4.00	16	18	20	24	26	30	31	31
5.00	16	18	21	25	27	30	32	32

	63	125	250	500	1k	2k	4k	8k
Screening Effect from above table (B):	5	6	6	6	7	8	8	8
SRI of Screen Panels (C):	13	22	21	24	27	31	29	30
Level at Receiver due to Screening Effect (A - B)=D:	51	55	53	49	48	47	44	34
Level at Receiver due to Direct Transmission (A - C)=E:	43	39	38	31	28	24	23	12
Resultant Level at Receiver (log add'n of D & E:	52	55	53	49	48	47	44	34
NR Level Required: NR50	75	65	59	53	50	47	45	43
Additional Attenuation Required:	-23	-10	-6	-4	-2	0	-1	-9

	63	125	250	500	1k	2k	4k	8k
dBA Correction:	-26	-16	-9	-3	0	1	1	-1
	25	39	44	46	48	48	45	33

Resultant Noise Level 54 dBA

	63	125	250	500	1k	2k	4k	8k
NR65	87	78	72	68	65	62	61	59
NR60	83	74	68	63	60	57	55	54
NR55	79	70	63	58	55	52	50	49
NR50	75	65	59	53	50	47	45	43
NR45	71	61	54	48	45	42	40	38
NR40	67	57	49	44	40	37	35	33
NR35	63	52	45	39	35	32	30	28
NR30	59	48	40	34	30	27	25	23
NR25	55	44	35	29	25	22	20	17

Completed By: Paul Horsley **Date:** 06.11.23

The results of the calculation indicate that the noise level within the gardens of the premises bounding the railway line is 54 LAeq 18-Hour dB. This calculated value is in keeping with the recorded values within the garden areas of the residential premises monitored during the survey, which range from 53.4 LAeq dB to 54.6 LAeq dB for the 4 No premises assessed.

A value of 54 LAeq dB is achieving the design intent of BS8233:2014 and the Local Authority guidance, confirming that the installed alternative acoustic barrier fence is acceptable and fit for purpose, in lieu of the approved Jakoustic Barrier System fence installation.

The 54 LAeq dB result within the garden would be equal for both the Jakoustic Barrier System fence as well as for the alternative acoustic barrier installation.

14.0 Report Summary

An additional noise assessment in accordance with BS8233:2014 and Calculation of Railway Noise (CRN) 1995 has been completed for the alternative acoustic barrier installation at the Harrison Croft, Station Road, Gilberdyke development.

The noise monitoring has been used to provide the necessary evidence to allow discharge of 'Variation of Condition 18 (acoustic fence) of planning permission 20/00937/VAR (Erection of 29 dwellings and associated access road) to allow for alternative fencing'.

The assessments have been conducted within the garden of No 12, 15, 17 and 18 Harrison Croft during daytime periods to account for the noise associated with train passage along the railway lines located beyond the relevant southern site boundary.

Train passage SEL values, background data and sound transmission testing of the installed alternative acoustic barrier have been completed.

The data recorded has allowed for a valid CRN value of the train noise to be determined, with a calculated result of 60.9 LAeq $_{18\text{-hour}}$ dB for daytime periods.

The sound transmission of the installed fence has been determined through testing, resulting in overall sound reduction values ranging between 26.0 to 28.2 LAeq dB dependent upon location.

Using the monitored data, calculated train passage noise results and the tested sound transmission of the installed fence, it has been possible to calculate the resultant value within the gardens due to the barrier effect provided by the acoustic fence located along the southern boundary of the development. The result assessed within the gardens of the premises is 54 LAeq dB.

Inspection of the initial design target of BS8233:2014 and the Local Authority guidance, it can be determined that the target has been achieved and that the alternative acoustic barrier installation is acceptable and fit for purpose.

Based upon the above information, a variation to Condition No 18 of 20/00937/VAR for use of an alternative acoustic fence at the application site, under Application No 22/03368/VAR can be achieved without any loss of amenity from the originally approved Jakoustic Barrier System installation.

Appendix A Site Plan and Monitoring Positions

Key

Approved Monitoring Locations

Appendix B Monitoring Equipment Calibration Certificates

AcSoft
Noise, Vibration & Air Quality

CALIBRATION CERTIFICATE

Date of issue: 10-08-2023 **Certificate No:** 1505909-1 **Page:** 1/8

INSTRUMENT DETAILS	Manufacturer:	**SVANTEK**	
	Model:	**SVAN 979**	
	Serial No.:	92932	
	Description:	Sound Level Meter	
SENSOR DETAILS	Manufacturer:	**GRAS**	**SVANTEK**
	Model:	**40AE**	**SV17**
	Serial No.:	370153	57804
	Description:	Microphone	Preamplifier
CUSTOMER	Paul Horsley Acoustics Ltd		
ENVIRONMENTAL CONDITIONS	Temperature:	20.3 – 21.4	°C
	Humidity:	72.1 – 73	%rh
	Pressure:	100.3 – 100.2	kPa
DATE OF CALIBRATION	10-08-2023		
APPROVED BY	A. Pullinger		

AcSoft
Noise, Vibration & Air Quality

AcSoft Calibration | 11 Abbey Court
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MK44 3WH | Bedford

+44 (0) 1234 639550

www.acsoft.co.uk

Calibration Certificate

Issued By: Castle Group Ltd

Date Of Issue : 25/01/23
Certificate No : 00530712/82076

Castle

All instruments are tested to check compliance with particular specifications. These may be an appropriate British or International Standard, or if the instrument was not originally designed to meet any such Standard, or when the instrument was originally manufactured a relevant Standard did not exist, the instrument will be tested to the manufacturer's original specification.

Absolute acoustic calibration of acoustic calibrators and sound level meters is checked at one or more standard frequencies against an independent sound source with calibration directly traceable to a National Standards Laboratory. The applicable reference for the calibration of the test equipment is shown below.

The performance of the instrument was determined by comparison with the manufacturers' specification as found in the instrument handbook or other technical publication. Any significant uncertainty of the measuring system will also be included.

The instrument was allowed to stabilise for a period of 30 minutes prior to measurements made.

The ambient temperature and relative humidity throughout calibration were 22 ±2 °C and 35% RH respectively.

Instruments used to carry out this calibration are as follows: -
Multifunction Calibrator 4226 Serial No: 3290080
Applicable Reference: CDK2209515.
Sound Level Meter GA117 Serial No 35781
Applicable Reference: UCRT21/1930

Subject of Calibration: Rion NC-74
Instrument: Sound Level Calibrator
Serial No: 00530712

Supplied Barometer Data (If applicable)
Barometer Type: –
Barometer Serial No: –

Output Data Corrected for test conditions at 1kHz
Reference Level (dB) : 94.0

Refer to calibrator handbook for any applicable microphone cavity insertion correction.

Basis Of Test: Compliance to Manufacturer's Original Specification

Calibrated By:
M. Mann
(Approved Signatory)

Checked By:
G. L. Wrightson
(Approved Signatory)

Date of Calibration: 25 Jan 2023

Recalibration Due: 01 Mar 2024

Completed Status: Pass

Client: Paul Horsley Acoustics Ltd
Address: 1 Upper Lane
Gomersal
Cleckheaton
West Yorkshire
BD19 4JD

Client Reference:

– Indicates item or information not available

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