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STANNINGHALL QUARRY PROPOSED NORTHERN EXTENSION

ES NOISE CHAPTER APPENDICES 30 JUNE 2020

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Appendix 10.1 – Glossary of Acoustic Terms

General Noise and Acoustics

The following section describes some of the parameters that are used to quantify noise.

Decibels dB

Noise levels are measured in decibels. The decibel is the logarithmic ratio of the sound pressure to a reference pressure ($2x10^{-5}$ Pascals). The decibel scale gives a reasonable approximation to the human perception of relative loudness. In terms of human hearing, audible sounds range from the threshold of hearing (0 dB) to the threshold of pain (140 dB).

A-weighted Decibels dB(A)

The 'A'-weighting filter emulates human hearing response for low levels of sound. The filter network is incorporated electronically into sound level meters. Sound pressure levels measured using an 'A'-weighting filter have units of dB(A) which is a single figure value to represent the overall noise level for the entire frequency range.

A change of 3 dB(A) is the smallest change in noise level that is perceptible under normal listening conditions. A change of 10 dB(A) corresponds to a doubling or halving of loudness of the sound. The background noise level in a quiet bedroom may be around 20 –30 dB(A); normal speech conversation around 60 dB(A) at 1 m; noise from a very busy road around 70-80 dB(A) at 10m; the level near a pneumatic drill around 100 dB(A).

Façade Noise Level

Façade noise measurements are those undertaken near to reflective surfaces such as walls, usually at a distance of 1m from the surface. Façade noise levels at 1m from a reflective surface are normally around 3 dB greater than those obtained under freefield conditions.

Freefield Noise Level

Freefield noise measurements are those undertaken away from any reflective surfaces other than the ground

Frequency Hz

The frequency of a noise is the number of pressure variations per second, and relates to the "pitch" of the sound. Hertz (Hz) is the unit of frequency and is the same as cycles per second. Normal, healthy human hearing can detect sounds from around 20 Hz to 20 kHz.

Octave and Third-Octave Bands

Two frequencies are said to be an octave apart if the frequency of one is twice the frequency of the other. The octave bandwidth increases as the centre frequency increases. Each bandwidth is 70% of the band centre frequency.

Two frequencies are said to be a third-octave apart if the frequency of one is 1.26 times the other. The third octave bandwidth is 23% of the band centre frequency.

There are recognised octave band and third octave band centre frequencies. The octave or third-octave band sound pressure level is determined from the energy of the sound which falls within the boundaries of that particular octave of third octave band.

Appendix 10.1 – Glossary of Acoustic Terms (cont…)

Day Evening Night Level L_{den}

The day evening night level is the average A-weighted sound level over a 24 hour period, determined from the L_{day} ($L_{Aeq,12hr}$ 7am-7pm), $L_{evening}$ ($L_{Aeq,4hr}$ 7pm-11pm) and L_{night} ($L_{Aeq,8hr}$ 11pm-7am), with a 5 dB penalty added to the $L_{evening}$ and a 10 dB penalty added to the L_{night}.

Equivalent Continuous Sound Pressure Level $L_{Aeq,T}$

The 'A'-weighted equivalent continuous sound pressure level $L_{Aeq,T}$, is a notional steady level which has the same acoustic energy as the actual fluctuating noise over the same time period T. The $L_{Aeq,T}$ unit is dominated by higher noise levels, for example, the $L_{Aeq,T}$ average of two equal time periods at, for example, 70 dB(A) and 50 dB(A) is not 60 dB(A) but 67 dB(A).

The $L_{Aeq,}$ is the chosen unit of BS 7445-1:2003 "Description and Measurement of Environmental noise".

Maximum Sound Pressure Level L_{Amax}

The L_{Amax} value describes the overall maximum 'A'-weighted sound pressure level over the measurement interval. Maximum levels are measured with either a fast or slow time weighted, denoted as $L_{Amax,f}$ or $L_{Amax,s}$ respectively.

Noise Rating NR

The noise rating level is a single figure index obtained from an octave band analysis of a noise. The NR level is obtained by comparing the octave band sound pressure levels to a set of reference curves and the highest NR curve that is intersected by the sound pressure levels gives the NR level.

Sound Exposure Level L_{AE} or SEL

The sound exposure level is a notional level which contains the same acoustic energy in 1 second as a varying 'A'-weighted noise level over a given period of time. It is normally used to quantify short duration noise events such as aircraft flyover or train passes.

Statistical Parameters L_N

In order to cover the time variability aspects, noise can be analysed into various statistical parameters, i.e. the sound level which is exceeded for N% of the time. The most commonly used are the $L_{A01,T}$, $L_{A10,T}$ and the $L_{A90,T}$.

$L_{A01,T}$ is the 'A'-weighted level exceeded for 1% of the time interval T and is often used to gives an indication of the upper maximum level of a fluctuating noise signal.

$L_{A10,T}$ is the 'A'-weighted level exceeded for 10% of the time interval T and is often used to describe road traffic noise. It gives an indication of the upper level of a fluctuating noise signal. For high volumes of continuous traffic, the $L_{A10,T}$ unit is typically 2–3 dB(A) above the $L_{Aeq,T}$ value over the same period.

$L_{A90,T}$ is the 'A'-weighted level exceeded for 90% of the time interval T, and is often used to describe the underlying background noise level.

Appendix 10.2 – Baseline Noise Survey Locations January 2020

Baseline Noise Survey Locations

Location	Description
1	Caius Heath Lane, immediately east of entrance to Caius Hill Farm House
2	Beverley Farm, on track approximately 80m west of Norwich Road (B1150)
3	On a track between dwellings at Horstead, approximately 50m west of Norwich Road (B1150) and approximately 40m east of a gate to the field
4	Highfield 1A Frettenham Road, east of the dwelling and near a field entrance gate
5	Field entrance to the north of Hill Farm
6	In the garden of The Hollies, also the install location

Appendix 10.2 – Baseline Noise Survey Locations January 2020 (cont…)

Processing Plant Measurement Locations

Location	Description
A	To the east of the processing plant, with a direct line of sight of the processing plant
B	To the south east of the processing plant, with a direct line of sight of the processing plant

Appendix 10.3 – Baseline Noise Survey Details January 2020

Date and Locations of Survey

Monday 20 January 2020 between 13:30 and 16:05 hours

Tuesday 21 January 2020 between 09:00 and 12:30 hours

Survey carried out by

Hannah Karban

Instrumentation used (Serial Number)

Norsonic 140 Sound Level Meter (1403138)
Norsonic 1251 Calibrator (31991)

Calibration

The sensitivity of the meter was verified on site immediately before and after the survey. The measured calibration levels were as follows:

Survey Date	Start Cal	End Cal
Monday 20 January 2020	113.7 dB(A)	113.6 dB(A)
Tuesday 21 January 2020	113.7 dB(A)	113.8 dB(A)

The meter and calibrator are tested monthly against a Bruel and Kjaer Pistonphone, type 4220 (serial number 375806) and a Norsonic Calibrator, type 1253 (serial number 22906) with UKAS approved laboratory certificate of calibration. In addition, the meter and calibrator undergo traceable calibration at an external laboratory every two years.

Survey Details

Attended sample measurements of 15 minute duration were taken at 6 locations on 20 and 21 January 2020. The microphone was at a height of between 1.2 and 1.5 metres above local ground level, with a windshield used throughout.

Attended plant measurements were taken at 2 locations on 21 January 2020 at Tarmac Stanninghall Quarry. The microphone was at a height of between 1.2 and 1.5 metres above local ground level, with a windshield used throughout.

Observations

The dominant source of noise for the baseline noise measurements were distant and local road traffic as well as birdsong.

Appendix 10.4 – Baseline Noise Survey Results January 2020

Monday 20 January 2020 – Dry, ~7°C, sunny, no cloud, <1m/s WSW breeze

Location	Start Time	Results dB (T = 15 minutes)			
		$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$	Comments / Observations
1	13:32	50	51	44	Distant road traffic, birdsong, vehicle passes, slight rustle of leaves, noisy motorbike on B1150.
2	13:52	51	54	46	Road traffic, breeze in bushes, birdsong, tractor movements on farm, occasional distant sounds from quarry.
3	14:13	44	47	38	Birdsong, distant bangs and activity from dwellings over the road, road traffic, movement in back garden, car movement at dwelling, distant dog bark.
4	14:33	56	56	37	Distant road traffic, distant birdsong, dog bark, vehicle passes, distant horn, distant helicopter, distant whistle, dog walker, distant quarry sounds in lulls.
5	14:52	61	60	39	Vehicle passes, dog barks at dwelling, distant aircraft, shouting at dwelling, distant quarry sounds in lulls, birdsong, breeze in trees.
6	15:45	47	46	36	Distant activity from quarry, broadband reversing beeper, helicopter, birdsong, distant aircraft, local and distant road traffic.

Appendix 10.4 – Baseline Noise Survey Results January 2020

Tuesday 21 January 2020 – Dry, ~0°C, dry, <1m/s WSW breeze, 100% cloud

Location	Start Time	Results dB (T = 15 minutes)			
		$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$	Comments / Observations
3	09:03	46	49	39	Road traffic, birdsong, distant road traffic in lulls of main road, distant aircraft, distant dog barks.
4	09:24	53	46	34	Distant and local road traffic, birdsong, distant aircraft.
3	09:47	46	48	37	Road traffic, birdsong, distant road traffic in lulls of main road, distant sounds to NW.
4	10:09	52	45	33	Distant and local road traffic, birdsong, dull thud.
3	10:31	47	49	37	Road traffic, birdsong, distant road traffic in lulls of main road, distant dog bark.
4	10:52	51	43	34	Distant and local road traffic, birdsong, distant dog bark.

Appendix 10.4 – Baseline Noise Survey Results January 2020 (cont…)

Tuesday 21 January 2020 – Processing Plant Measurements

Location	Start Time	Results dB			Comments / Observations
		$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$	
A	12:11	61	63	58	Processing plant, also with loading shovel pass.
A	12:12	60	60	59	Processing plant, no extraneous could be audible.
A	12:13	59	60	59	Processing plant, also with loading shovel movements and broadband reversing beeper.
B	12:22	65	67	64	Processing plant.
B	12:23	65	66	64	Processing plant.

Appendix 10.5 – Installed Sound Level Meter Details January 2020

Date and Locations of Survey

A data logging sound level meter was installed at Location 6 as follows:

Location	Installed Monday 20 January 2020	Collected Tuesday 21 January 2020
Garden of The Hollies, Frettenham Road	15:45 hours	12:50 hours

Survey carried out by

Installed and Collected by: Hannah Karban

Instrumentation and Calibration

The instrumentation used (including serial numbers in brackets) is tabulated below. The sensitivity of the meters was verified on site immediately before and after the survey using the field calibrator. The measured calibration levels were as follows:

Instrumentation (Serial Number)	Start Cal	End Cal
Norsonic 116 Sound Level Meter (21628)	93.7 dB(A)	94.1 dB(A)
Bruel & Kjaer 4230 Calibrator (1558653)		

The meter and calibrator are tested monthly against a Bruel and Kjaer Pistonphone, type 4220 (serial number 375806) and a Norsonic Calibrator, type 1253 (serial number 22906) with UKAS approved laboratory certificate of calibration. In addition, the meter and calibrator undergo traceable calibration at an external laboratory every two years.

Survey Details

A data logging sound level meter was installed and set to continually measure noise levels in 15-minute duration samples. The microphone was mounted on a tripod in the garden of The Hollies, approximately 1.4 m above local ground level; a weatherproof windshield was used throughout.

Appendix 10.6 – Installed Meter Noise Survey Results January 2020

Sound Level Meter Installed at The Hollies Frettenham Road

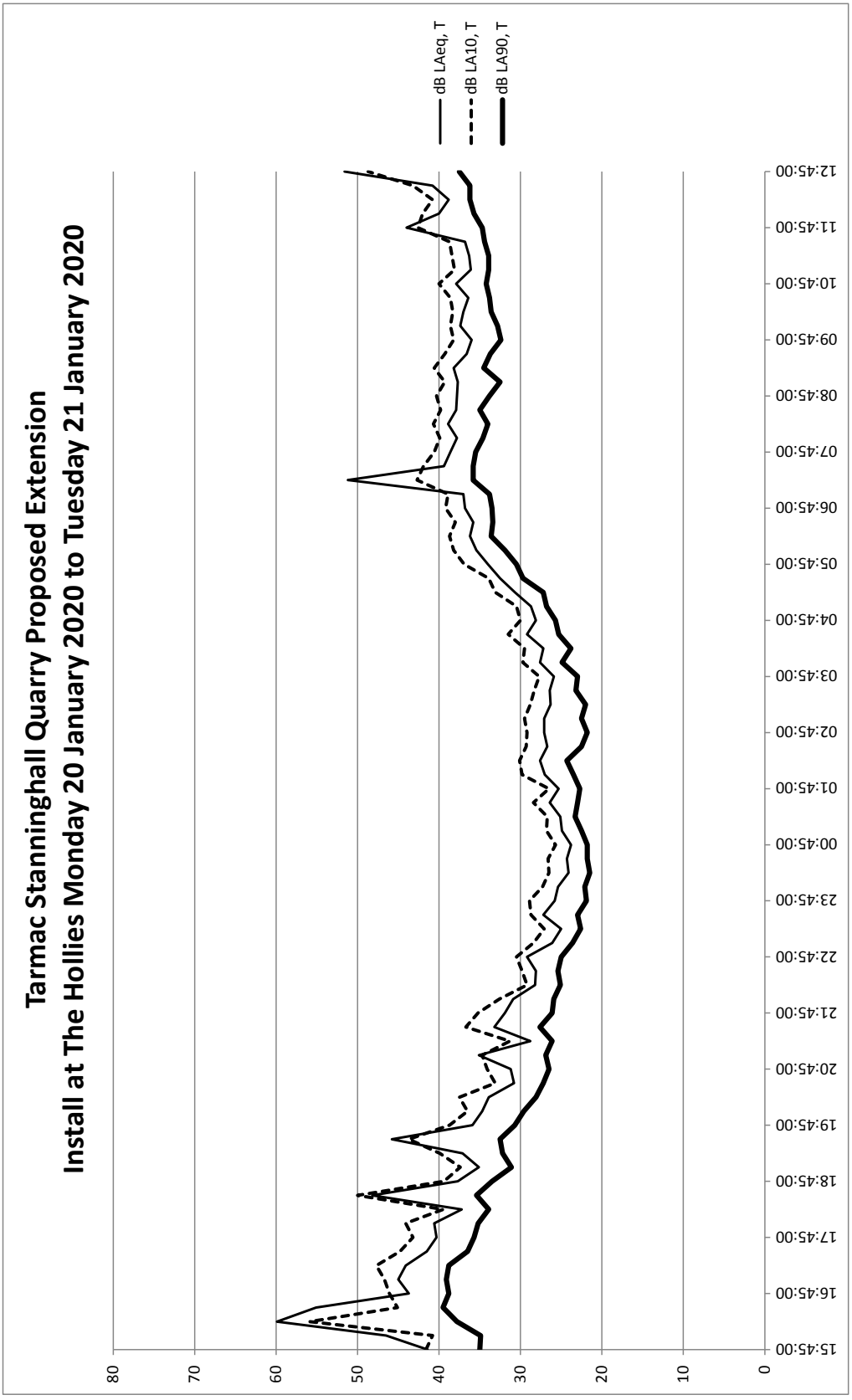
Monday 20 January 2020 to Tuesday 21 January 2020

Start Time	dB $L_{Aeq, T}$	dB $L_{A10, T}$	dB $L_{A90, T}$
15:45:00	41	42	35
16:00:00	47	41	35
16:15:00	60	56	38
16:30:00	55	45	40
16:45:00	44	46	39
17:00:00	45	47	39
17:15:00	44	48	39
17:30:00	42	45	37
17:45:00	40	43	36
18:00:00	41	44	35
18:15:00	37	40	34
18:30:00	48	50	35
18:45:00	38	39	34
19:00:00	35	37	31
19:15:00	37	40	32
19:30:00	46	44	33
19:45:00	36	39	31
20:00:00	35	37	30
20:15:00	34	38	28
20:30:00	31	33	27
20:45:00	31	34	27
21:00:00	35	35	27
21:15:00	29	31	26
21:30:00	33	37	28
21:45:00	32	35	26
22:00:00	31	33	26
22:15:00	28	29	25
22:30:00	28	30	25
22:45:00	29	31	25
23:00:00	26	28	24
23:15:00	25	27	23
23:30:00	27	29	23
23:45:00	26	29	22
00:00:00	25	27	22
00:15:00	24	27	22
00:30:00	24	27	22
00:45:00	24	26	22
01:00:00	25	27	23
01:15:00	25	27	23
01:30:00	26	28	23
01:45:00	25	27	23

Appendix 10.6 – Installed Meter Noise Survey Results January 2020

Start Time	dB $L_{Aeq, T}$	dB $L_{A10, T}$	dB $L_{A90, T}$
02:00:00	27	30	24
02:15:00	28	30	24
02:30:00	27	29	23
02:45:00	27	29	22
03:00:00	27	30	23
03:15:00	26	29	22
03:30:00	26	28	23
03:45:00	26	28	23
04:00:00	28	30	25
04:15:00	27	30	24
04:30:00	29	32	25
04:45:00	28	30	26
05:00:00	29	31	27
05:15:00	31	33	27
05:30:00	33	34	30
05:45:00	34	37	31
06:00:00	35	38	32
06:15:00	36	39	34
06:30:00	36	38	33
06:45:00	37	39	34
07:00:00	37	39	34
07:15:00	51	43	36
07:30:00	39	42	36
07:45:00	39	41	36
08:00:00	38	40	35
08:15:00	39	41	34
08:30:00	38	40	35
08:45:00	38	40	34
09:00:00	38	39	33
09:15:00	38	41	35
09:30:00	37	39	34
09:45:00	36	38	32
10:00:00	37	39	33
10:15:00	37	38	34
10:30:00	36	39	34
10:45:00	38	40	34
11:00:00	36	38	34
11:15:00	36	38	34
11:30:00	37	39	34
11:45:00	44	43	35
12:00:00	40	42	36
12:15:00	39	41	36
12:30:00	41	43	36
12:45:00	52	49	38

Appendix 10.6 – Installed Meter Noise Survey Results January 2020 (cont…)



Appendix 10.7 – Summary Including Routine Noise Monitoring

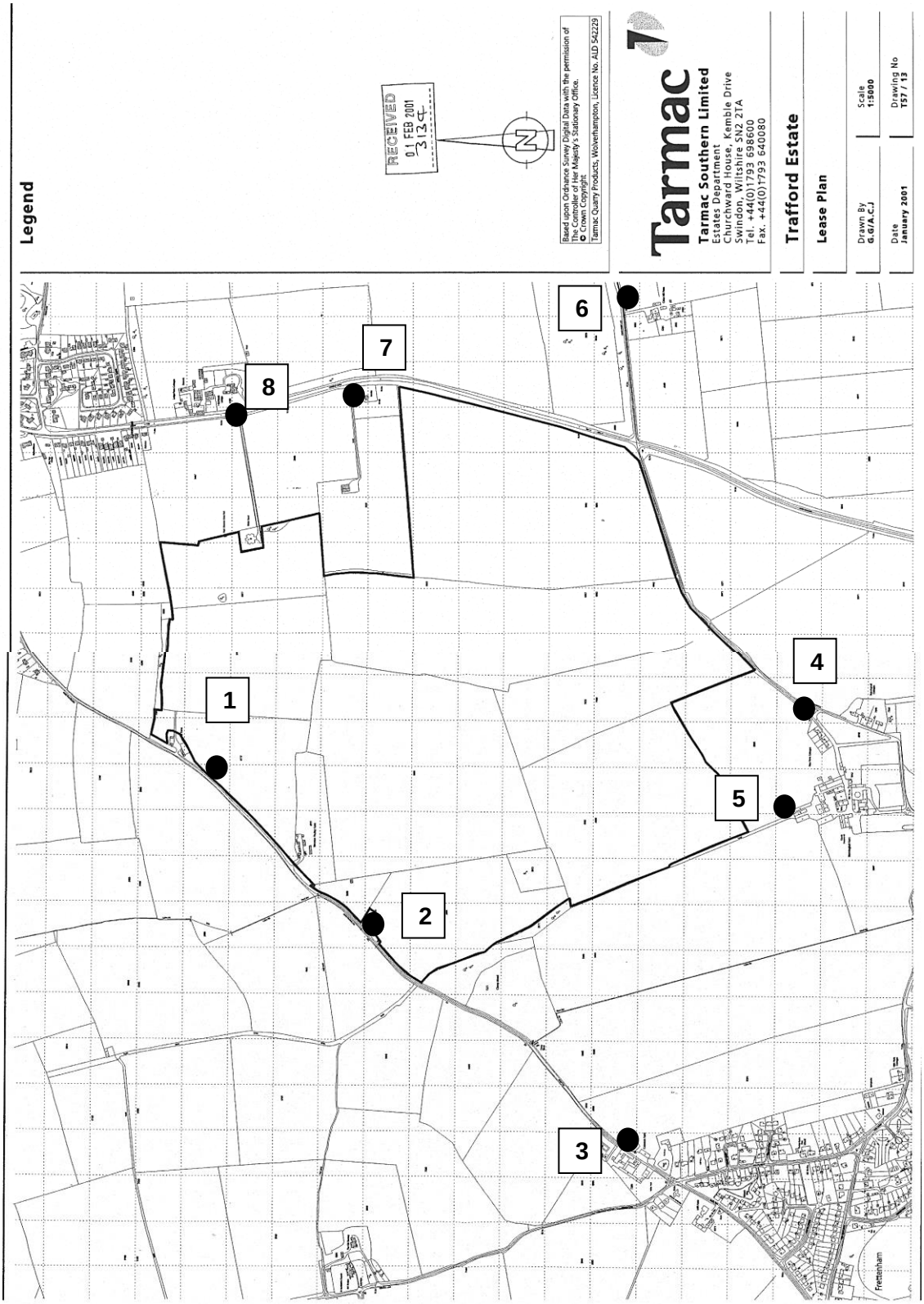
Date		Position	Start Time	Duration	LAeq,T	LA10,T	LA90,T
07/08/2015		1	12:21	15 minutes	58	54	32
17/02/2016		1	12:51	15 minutes	58	55	37
13/09/2016		1	12:41	15 minutes	55	52	36
15/02/2017		1	13:36	15 minutes	60	57	39
07/08/2017		1	13:19	15 minutes	57	54	32
22/02/2018		1	13:23	15 minutes	44	43	38
14/08/2018		1	13:53	15 minutes	51	45	32
12/02/2019		1	12:06	15 minutes	40	43	35
21/08/2019		1	12:43	15 minutes	63	65	35
20/01/2020		1	14:52	15 minutes	61	60	39
19/05/2020		1	14:21	15 minutes	44	44	31
Hill Farm			**Averages**		**58**	**52**	**35**
			Min		40	43	31
			Max		63	65	39
Date		**Position**	**Start Time**	**Duration**	**LAeq,T**	**LA10,T**	**LA90,T**
07/08/2015		2	12:39	15 minutes	46	41	31
17/02/2016		2	13:11	15 minutes	47	50	35
13/09/2016		2	12:22	15 minutes	53	49	38
15/02/2017		2	13:57	15 minutes	53	52	39
07/08/2017		2	13:42	15 minutes	50	48	31
22/02/2018		2	13:44	15 minutes	42	44	38
14/08/2018		2	14:13	15 minutes	50	48	31
12/02/2019		2	12:24	15 minutes	43	45	38
21/08/2019		2	13:01	15 minutes	52	48	33
20/01/2020		2	15:45	15 minutes	47	46	36
19/05/2020		2	14:50	15 minutes	45	47	38
The Hollies			**Averages**		**49**	**47**	**35**
			Min		42	41	31
			Max		53	52	39
Date		**Position**	**Start Time**	**Duration**	**LAeq,T**	**LA10,T**	**LA90,T**
07/08/2015		6	11:15	15 minutes	40	42	36
17/02/2016		6	11:45	15 minutes	49	50	44
13/09/2016		6	13:37	15 minutes	42	44	36
15/02/2017		6	12:38	15 minutes	48	51	44
07/08/2017		6	12:11	15 minutes	48	51	43
22/02/2018		6	12:10	15 minutes	47	49	40
14/08/2018		6	12:44	15 minutes	41	47	46
12/02/2019		6	13:38	15 minutes	50	52	45
21/08/2019		6	11:43	15 minutes	52	53	45
20/01/2020		6	13:32	15 minutes	50	51	44
19/05/2020		6	12:16	15 minutes	49	50	43
19/05/2020		6	15:55	15 minutes	45	47	35
Caius Hill Farm House			**Averages**		**48**	**49**	**42**
			Min		40	42	35
			Max		52	53	46

Appendix 10.7 – Summary Including Routine Noise Monitoring (cont…)

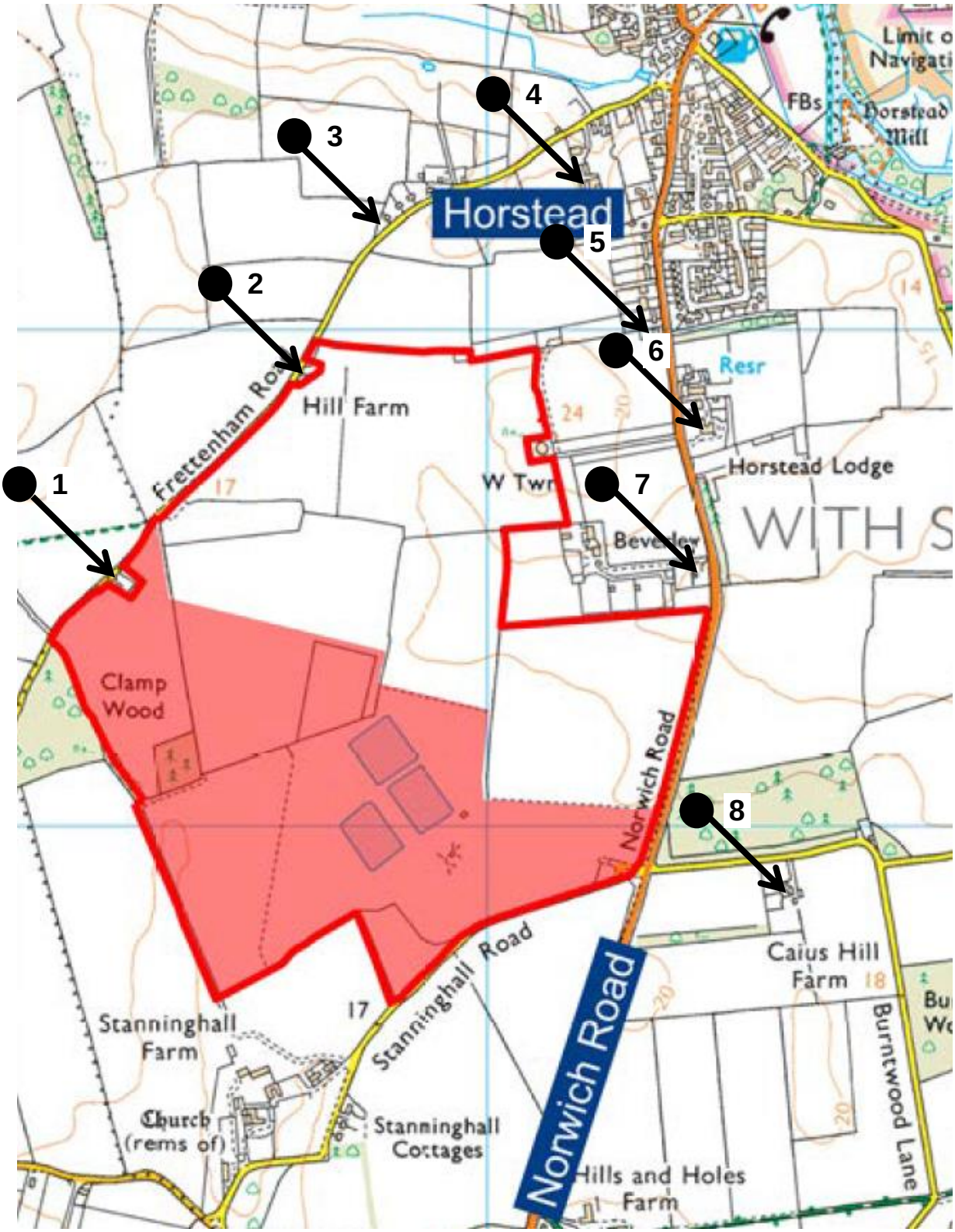
Date		Position	Start Time	Duration	LAeq,T	LA10,T	LA90,T
07/08/2015		7	11:40	15 minutes	50	52	42
17/02/2016		7	12:05	15 minutes	54	56	49
13/09/2016		7	13:01	15 minutes	52	52	43
15/02/2017		7	12:57	15 minutes	53	56	44
07/08/2017		7	12:34	15 minutes	50	53	44
22/02/2018		7	12:34	15 minutes	53	56	45
14/08/2018		7	13:06	15 minutes	51	54	44
12/02/2019		7	11:29	15 minutes	55	58	50
21/08/2019		7	12:03	15 minutes	61	64	48
20/01/2020		7	13:52	15 minutes	51	54	46
19/05/2020		7	12:42	15 minutes	60	59	46
Beverley Farm House			**Averages**		**55**	**56**	**46**
			Min		50	52	42
			Max		61	64	50
Date		**Position**	**Start Time**	**Duration**	**LAeq,T**	**LA10,T**	**LA90,T**
07/08/2015		8	12:00	15 minutes	58	61	48
17/02/2016		8	12:28	15 minutes	61	64	54
13/09/2016		8	13:19	15 minutes	62	66	51
15/02/2017		8	13:17	15 minutes	60	64	48
07/08/2017		8	12:56	15 minutes	58	61	45
22/02/2018		8	12:58	15 minutes	60	64	50
14/08/2018		8	13:28	15 minutes	56	59	47
12/02/2019		8	11:47	15 minutes	59	62	51
21/08/2019		8	12:22	15 minutes	58	60	51
19/05/2020		8	13:08	15 minutes	53	57	43
Horstead Lodge			**Averages**		**59**	**62**	**49**
			Min		53	57	43
			Max		62	66	54
			Start Time	**Duration**	**LAeq, T**	**LA10, T**	**LA90, T**
20/01/2020			14:13	15 minutes	44	47	38
21/01/2020			09:03	15 minutes	46	49	39
21/01/2020			09:47	15 minutes	46	48	37
21/01/2020			10:31	15 minutes	47	49	37
19/05/2020			13:36	15 minutes	51	56	38
Path between dwellings Horstead			**Averages**		**48**	**50**	**38**
			Min		44	47	37
			Max		51	56	39
			Start Time	**Duration**	**LAeq, T**	**LA10, T**	**LA90, T**
20/01/2020			14:33	15 minutes	56	56	37
21/01/2020			09:24	15 minutes	53	46	34
21/01/2020			10:09	15 minutes	52	45	33
21/01/2020			10:52	15 minutes	51	43	34
19/05/2020			13:54	15 minutes	47	46	34
Dwellings north on Frettenham Road			**Averages**		**52**	**47**	**34**
			Min		47	43	33
			Max		56	56	37

Appendix 10.7 – Summary Including Routine Noise Monitoring (cont…)

Plan copied from "*Trafford Quarry, Norfolk: Scheme of Noise Monitoring*"



Appendix 10.8 – Site Noise Calculation Locations Plan and List (cont…)



Appendix 10.8 – Site Noise Calculation Locations Plan and List (cont…)

No.	Site Noise Calculation Location	January 2020 Survey Location Number	Routine Monitoring Location Number
	See Plan in Appendix 10.8	See Appendix 10.2	See Appendix 10.7
1	The Hollies Frettenham Road	6	2
2	Hill Farm Frettenham Road	5	1
3	No. 8 Frettenham Road	4	n/a
4	Frettenham Road Horstead	n/a	n/a
5	112 Norwich Road Horstead	3	n/a
6	Horstead Lodge Norwich Road	n/a	8
7	Beverley Norwich Road	2	7
8	Caius Hill Farm Caius Heath Lane	1	6

Appendix 10.9 – Site Noise Calculation Methods and Summary Sheet

Specific noise levels are predicted or measured in terms of the Equivalent Continuous Noise Level, $L_{Aeq,T}$ over a given reference time interval, T. In the Planning Practice Guidance for Minerals the time interval for daytime, evening and night the reference time interval is 1 hour.

The calculation method for any plant which is relatively fixed in location is that set out in BS 5228-1: 2009 + A1: 2014, Annex F, and is the "Method for activity L_{Aeq}" described in section F.2.2 or the "Method for plant sound power level" described in section F.2.3.

The calculation method for site mobile plant such as lorries and dump trucks is that set out in BS 5228-1: 2009 + A1: 2014, Annex F, and is the "Method for mobile plant using a regular well defined route (e. g. haul roads)" described in section F. 2. 5.

Ground Absorption has been calculated using the technique set out in BS 5228-1: 2009 + A1: 2014, Annex F, assuming 90% soft ground between the working area and the receiver locations.

The method of assessing screening is that attributed to Maekawa as used in BS 5228-1: 2009 + A1: 2014, Annex F and various other Government published documents. This method uses the calculated path difference and octave band noise data for each noise source over the frequency range stated in BS 5228-1: 2009 + A1: 2014, Annex F.

The effects of ground absorption are not used in the calculations if screening has been assessed and offers a higher attenuation.

The nearest distances to the respective dwellings, from the various items of plant, have been used in an acoustic model for the site to calculate the reasonable worst case $L_{Aeq,T}$ site noise levels.

A summary site noise calculation sheet for one of the receiver locations is included below.

Appendix 10.9 – Site Noise Calculation Methods and Summary Sheet (cont…)

	TARMAC TRADING LIMITED	**5000**	**25-Jun-20**	**PWC**		Receiver Height :		1.5	m	Perimeter Bund Height :		3	m for Location No.1 & No. 2		
						Plant Site Ground Height :		15	m AOD	Soils and Overburden Depth :		1	m		
	PROPOSED EXTENSION TO STANNINGHALL QUARRY NORFOLK														
				Activity	Power LWA	1 hour	Capacity	Source		2 way flow	Speed	10		BS5228	
Ref	Plant Item	Comments on Plant		LAeq @ 10 m	or LWA / m	On-time %	Tonnes	Height		Q per hour	V kph	Plant Set back(m)		method	
1	Excavator at nearest edge of extraction, digging	Komatsu / Volvo 360°		76	104	50		2				10	m back	1	Activity
2	Excavator at nearest edge of extraction, loading	Komatsu / Volvo 360°		76	104	50		2				10	m back	1	Activity
3	Dump trucks to processing plant site	Volvo A25 / Volvo A30		76	104	100		2				20	m back	3	Defined Area
4	Concrete batching plant	WBM plant noise database		80	108	100		3				0	m back	1	Activity
5	Existing processing plant	Measured on site 21.01.20		80	108	100		4				0	m back	1	Activity
6	Existing processing plant	Measured on site 21.01.20		80	108	100		6				0	m back	1	Activity
7	Plant Item 7			-1027	-999	100		2				0	m back	1	Activity
8	Plant Item 8			-1027	-999	100		2				0	m back	1	Activity
9	Plant Item 9			-1027	-999	100		2				0	m back	1	Activity
10	Plant Item 10			-1027	-999	100		2				0	m back	1	Activity
11	Plant Item 11			-1027	-999	100		2				0	m back	1	Activity
12	Plant Item 12			-1027	-999	100		2				0	m back	1	Activity
13	Excavator	Temporary operations		75	103	100		2				0	m back	1	Activity
14	Dump truck	Temporary operations		76	104	100		2				0	m back	1	Activity
15	Dozer	Temporary operations		80	108	100		2				0	m back	1	Activity

Location No.	**1**	**The Hollies Frettenham Road**					
Receiver Height	18.5	m AOD				Suggested Site Noise Limit	
Site Noise Level for Items 1 to 6	**48**	dB LAeq, 1 hour, free field	Extraction & processing		**45**	dB LAeq, 1 hour, free field	
Site Noise Level for Items 13 to 15	**67**	dB LAeq, 1 hour, free field	Temporary operations		**70**	dB LAeq, 1 hour, free field	

Ref	**Plant Item**	Plan Distance	Working Distance	Ground Height	Working Height/depth	Source Height	Angle Degrees	Range Metres	Barrier -Receiver	Barrier Height	Path Diff.	Barrier Atten.	Soft Ground %	Ground Atten.	Resultant LAeq
1	Excavator at nearest edge of extraction, digging	80	90	17.0	-1.0	18.0	0	0	70	20.0	0.114	11.1	90.0	2.5	42.8
2	Excavator at nearest edge of extraction, loading	80	90	17.0	-1.0	18.0	0	0	70	20.0	0.114	11.1	90.0	2.5	42.8
3	Dump trucks to processing plant site	80	100	17.0	-1.0	18.0	0	300	70	20.0	0.081	10.2	90.0	2.7	40.3
4	Concrete batching plant	820	820	15.0	0.0	18.0	0	0	70	20.0	0.019	6.9	90.0	6.3	34.8
5	Existing processing plant	820	820	15.0	0.0	19.0	0	0	70	20.0	0.017	6.3	90.0	5.8	35.4
6	Existing processing plant	820	820	15.0	0.0	21.0	0	0	70	20.0	0.013	6.0	90.0	4.7	35.7
7	Plant Item 7	10000	10000	0.0	0.0	2.0	0	0	0	0.0	-1.000	0.0	0.0	0.0	-1087.0
8	Plant Item 8	10000	10000	0.0	0.0	2.0	0	0	0	0.0	-1.000	0.0	0.0	0.0	-1087.0
9	Plant Item 9	10000	10000	0.0	0.0	2.0	0	0	0	0.0	-1.000	0.0	0.0	0.0	-1087.0
10	Plant Item 10	10000	10000	0.0	0.0	2.0	0	0	0	0.0	-1.000	0.0	0.0	0.0	-1087.0
11	Plant Item 11	10000	10000	0.0	0.0	2.0	0	0	0	0.0	-1.000	0.0	0.0	0.0	-1087.0
12	Plant Item 12	10000	10000	0.0	0.0	2.0	0	0	0	0.0	-1.000	0.0	0.0	0.0	-1087.0
13	Excavator	50	50	0.0	0.0	2.0	0	0	0	0.0	-1.000	0.0	90.0	1.3	59.7
14	Dump truck	50	50	0.0	0.0	2.0	0	0	0	0.0	-1.000	0.0	90.0	1.3	60.7
15	Dozer	50	50	0.0	0.0	2.0	0	0	0	0.0	-1.000	0.0	90.0	1.3	64.7