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Appendix 12.1: Noise Monitoring Results

Appendix 12.1 Noise Monitoring Results

Monitoring Location 1 - North western boundary adjacent to Ipswich Road														
Time	L _{Aeq} (dB)	L _{A min} (dB)	L _{A max} (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments								
25/04/2014	- Night Tim	e												
0509-0524	50.8	34.0	66.2	38.1	56.1	Birdsong. Distant road traffic on the A12. Occasional road traffic on Ipswich Road.								
0650-0705	52.6	41.8	64.9	46.7	55.6	Frequent road traffic on Ipswich Road. Distant road traffic on the A12. Birdsong.								
25/04/2014	- Daytime													
0729-0744	56.4	52.7	69.2	54.4	57.6	Frequent road traffic on Ipswich Road. Distant road traffic on the A12. Birdsong.								
0811-0826	56.7	51.0	64.5	54.3	58.4	Frequent road traffic on Ipswich Road. Distant road traffic on the A12. Birdsong.								
0859-0914	56.4	51.1	64.7	53.7	58.1	Frequent road traffic on Ipswich Road. Distant road traffic on the A12. Birdsong.								

Monitoring I	Aonitoring Location 2 - Eastern boundary adjacent to Sandy lane														
Time	LAeq	L _{A min}	L _{A max}	L _{A90}	L _{A10}	Comments									
	(dB)	(dB)	(dB)	(dB)	(dB)										
25/04/2014	- Night Tim	e													
						Birdsong. Distant road traffic on the									
0600-0615	47.7	37.6	60.7	39.8	52.6	A12. 1 car on Sandy Lane. Distant									
					bird scarer.										
24/04/2014	- Daytime														
1627 1722	16.0	20.0	62 E	22.7	E1 /	Occasional road traffic on Sandy									
1037-1723	40.9	29.9	03.5	55.7	51.4	Lane. Birdsong.									
1751 1906	11.2	21.0	E0 0	22.0	18.0	Occasional road traffic on Sandy									
1731-1800	44.5	51.0	30.0	55.5	40.9	Lane. Birdsong. High level aircraft.									

Monitoring I	Ionitoring Location 3 - Southern boundary adjacent to the railway line														
Time	L _{Aeq} (dB)	L _{A min} (dB)	L _{A max} (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments									
25/04/2014	- Night Time	e													
0620-0641	55.5	39.7	83.1	42.1	46.7	Noise from the passage of 2 passenger trains. Distant road traffic on the A12. Birdsong. High level aircraft.									
24/04/2014	- Daytime														
1601-1628	53.5	31.0	80.7	32.4	39.3	Noise from the passage of 2 passenger trains. Birdsong.									
1726-1748	56.2	33.4	81.1	35.1	45.9	Noise from the passage of 2 passenger trains. Birdsong. High level aircraft.									

Monitoring	Monitoring Location 3 - Southern boundary adjacent to the railway line (Continued)														
Time	L _{Aeq}	L _{A min}	L _{A max}	L _{A90}	L _{A10}	Comments									
	(dB)	(dB)	(dB)	(dB)	(dB)										
25/04/2014	- Daytime														
0747-0804	61.7	46.1	84.2	47.0	50.8	Noise from the passage of 2 passenger trains and 1 freight train. Birdsong. Distant road traffic on the A12.									
0920-0937	54.1	43.0	79.0	45.0	50.0	Noise from the passage of 1 passenger train. Birdsong. Distant road traffic on the A12.									

Monitoring	Location 4 -	Western bo	undary adja	cent to Top	Street	
Time	L _{Aeq} (dB)	L _{A min} (dB)	L _{A max} (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
25/04/2014	- Night Tim	e				
0530-0545	49.5	37.8	66.8	44.6	52.1	Distant road traffic on the A12. Birdsong. Occasional road traffic on Top Street and Ipswich Road.
25/04/2014	- Daytime					
0712-0727	55.2	49.8	66.5	52.5	56.9	Noise from road traffic on Ipswich Road and the A12. Occasional road traffic on Top Street. Birdsong.
0829-0849	58.3	52.2	69.7	55.8	59.7	Near constant road traffic on Top Street. Noise from road traffic on Ipswich Road and the A12. Birdsong.

Daytime and Night-time Noise Levels Across the Development Site

During the noise survey, rail movements were audible at monitoring location ML3. However, the frequency of train movements varies throughout the day and night, and therefore short period measured levels are not necessarily representative of the entire day or night time periods.

To adjust the measured levels and properly account for train movements throughout the 24 hour period, the following steps are taken: Firstly, remove railway noise from the measured levels (by omitting it from the time history output of the sound level meter) to obtain the 'residual' noise levels. These are set out in Table 1.

Table 1: Summary of Residual Noise Levels Across the Site													
Monitoring Location	Time, h	Residual LAeq dB											
Night Time Measurements													
3	0620-0641	47.3											
	Night-time Average 47.3												
Daytime Measurements													
3	1601-1629	36.8											
	1726-1748	40.3											
	0747-0804	48.7											
	0920-0937	47.7											
	Daytime Average	43.4											

Secondly, the average noise level of all trains using the line must be determined from the measurement data. During the noise survey, train movements at measurement location 3, located 20m from the train line, and the Sound Exposure Levels (SEL) of all trains passing the site were measured, and is summarised in Appendix B.

The third step is to determine the total number of train movements during the daytime and night time. The passenger train movements were counted using the Electronic National Rail Timetable (eNRT), valid from 11th May 2015. To be robust, the highest number of timetabled daytime and night time movements throughout the week has been used in this assessment.

The Network Rail Working Time Table (WTT), valid May 2015, has been reviewed, but it did not indicate any timetabled movements of freight train on the line. However, during the time of the survey a freight train consisting of 4 carriages did was witnessed on the line. Therefore, to be robust an estimation of freight train movements has been included.

The total number of train movements passing the site is shown in Table 2:

Table 2: Train Movements Adjacent to the Site											
Time	Number of Train Movements During the Week (Monday-										
Time	Friday)										
0700 2200	Weekday = 31 passenger train movements										
0700-2300	5 freight train movements										
2200 0700	Weekday = 2 passenger train movements										
2500-0700	1 freight train movement										

For the purpose of this assessment, the average SEL measured at monitoring location 2, during the daytime and night time has been used in the predictions, at a distance of 20m from the train line (the approximate location of the nearest dwelling), to give the worst case scenario. The residual noise levels from measurement location have also been used in the assessment as it is assumed to be representative of levels in the south of the site.

The final step is to combine the results of the previous three steps to obtain noise levels which are inclusive of all train movements. Following the prediction methodology set out in CORN (Calculation of Railway Noise, 1995), the daytime and night time noise levels have been determined (including all train movements in Table 2) as shown in Table 3.

Table 3: Calculation of Daytime the Site	16 hour	L _{Aeq} and Night-time	8 hour L _{Aeq} at Monito	oring Locations Across
		Passenger/Freight Train noise only (calculated)	Residual noise Taken from Table 1.	Ambient noise including all train movements (calculated)
Monitoring Location 3				
Daytime		50.5	43.4	53.1
$L_{Aeq} = SEL + 10log(N) - 10log(T)$				
Passenger train SEL =	83.2			
No of Passenger Trains N =	31			
Time period T = 16 hours =	57600			
L _{Aeq} = SEL +10log(N) - 10log(T)		48.4		
Freight train SEL =	89.0			
No of Frieght Trains N =	5			
Time period T = 16 hours =	57600			
Night-time		42	47.3	49.9
LAeq = SEL +10log(N) – 10log(T)				
Passenger train SEL =	83.6			
No of Passenger Trains N =	2			
Time period T = 16 hours =	28800			
LAeq = SEL +10log(N) – 10log(T)		44.4		
Freight train SEL =	89.0			
No of Frieght Trains N =	1			
Time period T = 16 hours =	28800			

Appendix 12.2: Summary of Train Movements Observed During the Noise Survey

Appendix 12.2

Summary of Train Movements Observed during the Noise Survey

Time	No of Carriages	Туре	Direction Travelling	Approx Speed (mph)	Measured L _{max,f} dB	Measured SEL
Monitor	ing Location	3 - 20m From Rai	lway Line			
24/04/2	014					
1608	1	Passenger	East	40	80.7	82.5
1622	3	Passenger	West	40	79.6	82.5
1729	3	Passenger	East	40	81.1	84.3
1731	2	Passenger	West	40	80.7	83.4
25/04/2	014					
0633	1	Passenger	East	40	83.1	84.4
0636	2	Passenger	West	40	81.0	82.8
0748	2	Passenger	East	40	81.7	85.2
0754	2	Passenger	West	40	79.7	81.8
0802	4	Freight	East	30	84.2	89.0
0929	2	Passenger	West	40	79.0	82.5

Appendix 12.3: Vibration Monitoring Results

Appendix 12.3 Vibration Monitoring Results





Appendix 12.4: CRTN Calculations

Appendix 12.4 - CRTN Calculation - Existing Receptors Base

* Valid for d ≥ 4 metres

** Values from Traffic Data provided by Hydrock

Stage 1	Stage 2						Stage 2	Stage 2	2	Stage 2	Stage 3 Stage 4											Stage 5			
Without Development 2025																									
Link	Receptor	Traffic Flow, Q veh/18- hour day**	L _{10 (18-hour)} dB(A) (CRTN Chart 3)	Traffic Mean Speed, V mph**	Speed Mean Speed, V km/h	HGV, p %**	Correction for Mean Traffic Speed, V, and Percentage Heavy Vehicles, p (CRTN Chart 4)	Road surface	Road Surface Correction (CRTN Para. 16)	Basic Noise Level dB(A)	Shortest horizontal distance, d (m)	Height of reception point relative to effective source position, h (m)	Shortest slant distance from the effective source position, d' (m) (CRTN Chart 7)	Distance Correction dB(A) (CRTN Chart 7)*	Average Height of Propagation, H (m) (Para 20.2 CRTN)	Absorbent Ground Cover % (Para 20.4 CRTN)	Absorbent Ground Cover, I	Absorbent Ground Cover Correction dB(A) (CRTN Chart 8)	Propagation Correction dB(A)	Façade Correction dB(A) (CRTN Para. 26.1)	Angle of view segment, θ (deg)	Angle of View Correction dB(A) (CRTN Chart 10)	Site Layout Correction dB(A)	Combined Noise Level dB(A)	Combined Façade Noise Level dB(A)
A12 NE	ESR1	39,060	75.0	70	112.6	5.4	4.6	Impervious (SMA)	-1	78.6	30.0	1.2	33.5	-3.9	1.1	≥90	1.0	-4.3	-8.2	2.5	170.0	-0.2	2.3	72.7	72.7
																								72.7	<u> </u>
With Development 2025	1	1	r									1		r	Т	1			1			1			
Link	Receptor	Traffic Flow, Q veh/18- hour day**	L _{10 (18-hour)} dB(A) (CRTN Chart 3)	Traffic Mean Speed, V mph**	Speed Mean Speed, V km/h	HGV, p %**	Correction for Mean Traffic Speed, V, and Percentage Heavy Vehicles, p (CRTN Chart 4)	Road surface	Road Surface Correction (CRTN Para. 16)	Basic Noise Level dB(A)	Shortest horizontal distance, d (m)	Height of reception point relative to effective source position, h (m)	Shortest slant distance from the effective source position, d' (m) (CRTN Chart 7)	Distance Correction dB(A) (CRTN Chart 7)*	Average Height of Propagation, H (m) (Para 20.2 CRTN)	Absorbent Ground Cover % (Para 20.4 CRTN)	Absorbent Ground Cover, I	Absorbent Ground Cover Correction dB(A) (CRTN Chart 8)	Propagation Correction dB(A)	Façade Correction dB(A) (CRTN Para. 26.1)	Angle of view segment, θ (deg)	Angle of View Correction dB(A) (CRTN Chart 10)	Site Layout Correction dB(A)	Combined Noise Level dB(A)	Combined Façade Noise Level dB(A)
B1438 East of site access	ESR2	14,292	70.7	30	48.3	3.6	-1.6	Impervious (SMA)	-1	68.0	10.0	1.2	13.6	0.0	1.1	≥90	1.0	-2.2	-2.2	2.5	170.0	-0.2	2.3	68.1	68.1
																								68.1	0011
Without Development 2025																									
Link	Receptor	Traffic Flow, Q veh/18- hour day**	L _{10 (18-hour)} dB(A) (CRTN Chart 3)	Traffic Mean Speed, V mph**	Speed Mean Speed, V km/h	HGV, p %**	Correction for Mean Traffic Speed, V, and Percentage Heavy Vehicles, p (CRTN Chart 4)	Road surface	Road Surface Correction (CRTN Para. 16)	Basic Noise Level dB(A)	Shortest horizontal distance, d (m)	Height of reception point relative to effective source position. h (m)	Shortest slant distance from the effective source position, d' (m) (CRTN Chart 7)	Distance Correction dB(A) (CRTN Chart 7)*	Average Height of Propagation, H (m) (Para 20.2 CRTN)	Absorbent Ground Cover % (Para 20.4 CRTN)	Absorbent Ground Cover, I	Absorbent Ground Cover Correction dB(A) (CRTN Chart 8)	Propagation Correction dB(A)	Façade Correction dB(A) (CRTN Para. 26.1)	Angle of view segment, θ (deg)	Angle of View Correction dB(A) (CRTN Chart 10)	Site Layout Correction dB(A)	Combined Noise Level dB(A)	Combined Façade Noise Level dB(A)
Sandy Lane	ESR3	1,474	60.8	30	48.3	1.8	-2.3	Impervious (SMA)	-1	57.5	10.0	1.2	13.6	0.0	1.1	≥90	1.0	-2.2	-2.2	2.5	130.0	-1.4	1.1	56.4	56.4
																							· .	56.4	50.4
With Development 2025																									
Link	Receptor	Traffic Flow, Q veh/18- hour day**	L _{10 (18-hour)} dB(A) (CRTN Chart 3)	Traffic Mean Speed, V mph**	Speed Mean Speed, V km/h	HGV, p %**	Correction for Mean Traffic Speed, V, and Percentage Heavy Vehicles, p (CRTN Chart 4)	Road surface	Road Surface Correction (CRTN Para. 16)	Basic Noise Level dB(A)	Shortest horizontal distance, d (m)	Height of reception point relative to effective source position, h (m)	Shortest slant distance from the effective source position, d' (m) (CRTN Chart 7)	Distance Correction dB(A) (CRTN Chart 7)*	Average Height of Propagation, H (m) (Para 20.2 CRTN)	Absorbent Ground Cover % (Para 20.4 CRTN)	Absorbent Ground Cover, I	Absorbent Ground Cover Correction dB(A) (CRTN Chart 8)	Propagation Correction dB(A)	Façade Correction dB(A) (CRTN Para. 26.1)	Angle of view segment, θ (deg)	Angle of View Correction dB(A) (CRTN Chart 10)	Site Layout Correction dB(A)	Combined Noise Level dB(A)	Combined Façade Noise Level dB(A)
Top Street North	ESR4	10,402	69.3	60	96.5	2.0	2.6	Impervious (SMA)	-1	70.9	5.0	1.2	8.6	2.0	1.1	≥90	1.0	-1.2	0.8	2.5	180.0	0.0	2.5	74.2	74.2

Appendix 12.4 - CRTN Calculation - Existing Receptors Future Years Assessment

* Valid for d ≥ 4 metres

** Values from Traffic Data provided by Hydrock

Values from frame bata pro	orlaca by riyaro																								
Stage 1	Stage 2						Stage 2 Stage 2 Stage 3						St		Stag	;e 5									
With and David and and 2025																									
Link	Receptor	Traffic Flow, Q veh/18- hour day**	L _{10 (18-hour)} dB(A) (CRTN Chart 3)	Traffic Mean Speed, V mph**	c Speed Mean Speed, V km/h	HGV, p %**	Correction for Mean Traffic Speed, V, and Percentage Heavy Vehicles, p (CRTN Chart 4)	Road surface	Road Surface Correction (CRTN Para. 16)	Basic Noise Level dB(A)	Shortest horizontal distance, d (m)	Height of reception point relative to effective source position, h (m)	Shortest slant distance from the effective source position, d' (m) (CRTN Chart 7)	Distance Correction dB(A) (CRTM Chart 7)*	Average Height of Propagation, I H (m) (Para 20.2 CRTN)	Absorbent Ground Cover % (Para 20.4 CRTN)	Absorbent Ground Cover, I	Absorbent Ground Cover Correction dB(A) (CRTN Chart 8)	Propagation Correction dB(A)	Façade Correction dB(A) (CRTN Para. 26.1)	Angle of view segment, θ (deg)	Angle of View Correction dB(A) (CRTN Chart 10)	Site Layout Correction dB(A)	Combined Noise Level dB(A)	Combined Façade Noise Level dB(A)
A12 NE	ESR1	53,084	76.3	70	112.6	2.8	4.2	Impervious (SMA)	-1	79.5	30.0	1.2	33.5	-3.9	1.1	≥90	1.0	-4.3	-8.2	2.5	170.0	-0.2	2.3	73.6	72.6
																								73.6	/3.6
With Development 2025																									
Link	Receptor	Traffic Flow, Q veh/18- hour day**	L _{10 (18-hour)} dB(A) (CRTN Chart 3)	Traffic Mean Speed, V	C Speed Mean Speed, V	HGV, p %**	Correction for Mean Traffic Speed, V, and Percentage Heavy Vehicles, p (CRTN	Road surface	Road Surface Correction (CRTN Para.	Basic Noise Level dB(A)	Shortest horizontal distance, d	Height of reception point relative to effective source	Shortest slant distance from the effective source position, d' (m)	Distance Correction dB(A) (CRTN Chart 7)*	Average Height of Propagation, H (m) (Para	Absorbent Ground Cover % (Para 20.4	Absorbent Ground Cover, I	Absorbent Ground Cover Correction dB(A) (CRTN	Propagation Correction dB(A)	Façade Correction dB(A) (CRTN	Angle of view segment, θ	Angle of View Correction dB(A) (CRTN	Site Layout Correction dB(A)	Combined Noise Level dB(A)	Combined Façade Noise Level
				mpn	KIII/II		Chart 4)		16)		(11)	position, h (m)	(CRTN Chart 7)	Chart 7)	20.2 CKTN)	CRTN)		Chart 8)		Para. 20.1)	(ueg)	Chart 10)			UB(A)
A12 NE	ESR1	49.840	76.1	70	112.6	2.8	4.2	Impervious (SMA)	-1	79.3	30.0	1.2	33.5	-3.9	1.1	≥90	1.0	-4.3	-8.2	2.5	170.0	-0.2	2.3	73.3	
																								73.3	73.3
Without Development 2025	1										-				1						r		r	r	-
		Troffic Flow		Traffic	c Speed	-	Correction for Mean		Road		Shortest	Height of	Shortest slant	Distance	Average Height	Absorbent	Abcorbont	Absorbent	Propagation	Façade	Angle of	Angle of View	Site Lavout	Combined	Combined
Link	Recentor	O veh/18-	L10 (18-hour) dB(Δ) (CRTN	Mean	Mean	HGV, p	Percentage Heavy	Road surface	Correction	Basic Noise Level dB(A)	horizontal	relative to	effective source	Correction	of Propagation,	Cover %	Ground	Correction	Correction	Correction	view	Correction	Correction	Noise Level	Façade
Link	neceptor	hour day**	Chart 3)	Speed, V	Speed, V	%**	Vehicles, p (CRTN	Noau suitace	(CRTN Para.	basic Noise Level ub(A)	distance, d	effective source	position, d' (m)	dB(A) (CRTN	H (m) (Para	(Para 20.4	Cover. I	dB(A) (CRTN	dB(A)	dB(A) (CRTN	segment, θ	dB(A) (CRTN	dB(A)	dB(A)	Noise Level
			,	mph**	km/h		Chart 4)		16)		(m)	position, h (m)	(CRTN Chart 7)	Chart 7)*	20.2 CRTN)	CRTN)		Chart 8)		Para. 26.1)	(deg)	Chart 10)			dB(A)
B1438 East of site access	ESR2	19,547	72.0	30	48.3	1.3	-2.4	Impervious (SMA)	-1	68.6	10.0	1.2	13.6	0.0	1.1	≥90	1.0	-2.2	-2.2	2.5	170.0	-0.2	2.3	68.6	69.6
																								68.6	08.0
With Development 2025																									
with Development 2025	T	1	1	Traffi	c Sneed	1	Correction for Mean		Boad		1	Height of	Shortest slant	1	1	Absorbent		Absorbent		1		1	1		1
		Traffic Flow,	L10 (18-bour)		- speca	-	Traffic Speed, V. and		Surface		Shortest	reception point	distance from the	Distance	Average Height	Ground	Absorbent	Ground Cover	Propagation	Façade	Angle of	Angle of View	Site Layout	Combined	Combined
Link	Receptor	Q veh/18-	dB(A) (CRTN	Mean	Mean	HGV, p	Percentage Heavy	Road surface	Correction	Basic Noise Level dB(A)	horizontal	relative to	effective source	Correction	of Propagation,	Cover %	Ground	Correction	Correction	Correction	view	Correction	Correction	Noise Level	Façade
	-	hour day**	Chart 3)	speed, v	Speed, V	%**	Vehicles, p (CRTN		(CRTN Para.		distance, d	effective source	position, d' (m)	dB(A) (CRIN	H (m) (Para	(Para 20.4	Cover, I	dB(A) (CRTN	dB(A)	dB(A) (CRIN	segment, 0	dB(A) (CRIN	dB(A)	dB(A)	Noise Level
		-		mpn**	km/n		Chart 4)		16)		(m)	position, h (m)	(CRTN Chart 7)	Chart /)*	20.2 CRIN)	CRTN)		Chart 8)		Para. 26.1)	(deg)	Chart 10)			dB(A)
B1438 East of site access	ESR2	19,651	72.0	30	48.3	1.3	-2.4	Impervious (SMA)	-1	68.6	10.0	1.2	13.6	0.0	1.1	≥90	1.0	-2.2	-2.2	2.5	170.0	-0.2	2.3	68.6	68.6
																								68.6	
Without Development 2025	_																								
The for the second principal costs	1	1		Traffic	c Speed	1	Correction for Mean		Road			Height of	Shortest slant			Absorbent		Absorbent					1		
		Traffic Flow,	L _{10 (18-hour)}				Traffic Speed, V, and		Surface		Shortest	reception point	distance from the	Distance	Average Height	Ground	Absorbent	Ground Cover	Propagation	Façade	Angle of	Angle of View	Site Layout	Combined	Combined
Link	Receptor	Q veh/18-	dB(A) (CRTN	Speed V	Sneed V	/ %**	Percentage Heavy	Road surface	Correction	Basic Noise Level dB(A)	distance d	relative to	effective source	dB(A) (CRTN	H (m) (Para	Cover %	Ground	Correction	Correction	dB(A) (CRTN	segment A	dB(A) (CRTN	Correction	Noise Level	Noise Level
		hour day**	Chart 3)	mnh**	km/h	70	Vehicles, p (CRTN		(CRTN Para.		(m)	effective source	position, d' (m)	Chart 7)*	20.2 CRTN)	(Para 20.4	Cover, I	dB(A) (CRTN	dB(A)	Para 26 1)	(deg)	Chart 10)	dB(A)	dB(A)	dB(A)
				mpn			Chart 4)		16)		(,	position, h (m)	(CRTN Chart 7)	cildite 7 j	2012 61111	CRTN)		Chart 8)			(405)	c			ubini
Sandy Lane	ESR3	1,840	61.7	30	48.3	6.1	-0.9	Impervious (SMA)	-1	59.9	10.0	1.2	13.6	0.0	1.1	290	1.0	-2.2	-2.2	2.5	130.0	-1.4	1.1	58./	58.7
																								50.7	1
With Development 2025	1										-				1						r		r	r	-
		Traffic Flow	1	Traffic	c Speed	-	Correction for Mean		Koad		Shortest	Height of	Shortest slant	Distance	Average Height	Absorbent	Absorbant	Absorbent	Propagation	Façade	Angle of	Angle of View	Site Lavout	Combined	Combined
Link	Recentor	O veh/18-	HIO (18-hour)	Mean	Mean	HGV, p	Percentage Heavy	Road surface	Correction	Basic Noise Level dB(A)	horizontal	relative to	effective source	Correction	of Propagation,	Cover %	Ground	Correction	Correction	Correction	view	Correction	Correction	Noise Level	Façade
	neceptor	hour day**	Chart 3)	Speed, V	Speed, V	%**	Vehicles, p (CRTN	noud surface	(CRTN Para.		distance, d	effective source	position, d' (m)	dB(A) (CRTN	H (m) (Para	(Para 20.4	Cover. I	dB(A) (CRTN	dB(A)	dB(A) (CRTN	segment, θ	dB(A) (CRTN	dB(A)	dB(A)	Noise Level
		,	,	mph**	km/h		Chart 4)		16)		(m)	position, h (m)	(CRTN Chart 7)	Chart 7)*	20.2 CRTN)	CRTN)	,-	Chart 8)		Para. 26.1)	(deg)	Chart 10)		(-)	dB(A)
Sandy Lane	ESR3	1,729	61.5	30	48.3	6.1	-0.9	Impervious (SMA)	-1	59.6	10.0	1.2	13.6	0.0	1.1	≥90	1.0	-2.2	-2.2	2.5	130.0	-1.4	1.1	58.5	59.5
																								58.5	50.5
With and Davidson and 2025	_																								
without Deviopment 2025	1	1		Traffic	c Speed	1	Correction for Mean		Road			Height of	Shortest slant			Absorbent		Absorbent					1	1	
		Traffic Flow,	L _{10 (18-hour)}				Traffic Speed, V, and		Surface		Shortest	reception point	distance from the	Distance	Average Height	Ground	Absorbent	Ground Cover	Propagation	Façade	Angle of	Angle of View	Site Layout	Combined	Combined
Link	Receptor	Q veh/18-	dB(A) (CRTN	Mean	Viean	HGV, p	Percentage Heavy	Road surface	Correction	Basic Noise Level dB(A)	norizontal	relative to	effective source	dp(A) (CPTA	of Propagation,	Cover %	Ground	Correction	Correction	dP(A) (CRTN	view	dP(A) (CPTN)	Correction	Noise Level	Façade Noise Level
		hour day**	Chart 3)	mnh**	km/h	70	Vehicles, p (CRTN		(CRTN Para.		(m)	effective source	position, d' (m)	Chart 7)*	20.2 CRTN)	(Para 20.4	Cover, I	dB(A) (CRTN	dB(A)	Para 26 1)	(deg)	Chart 10)	dB(A)	dB(A)	dB(A)
				inpir -	Kiii/II		Chart 4)		16)		(,	position, h (m)	(CRTN Chart 7)	chart //	20.2 (1114)	CRTN)		Chart 8)		. ara. 20.1)	(ucg)	cilar(10)			
Top Street North	ESR4	14,969	70.9	60	96.5	1.6	2.5	Impervious (SMA)	-1	72.4	5.0	1.2	8.6	2.0	1.1	≥90	1.0	-1.2	0.8	2.5	180.0	0.0	2.5	75.7	75.7
																								/5./	I]
With Devlopment 2025				_																					
				Traffic	c Speed		Correction for Mean		Road		Shortest	Height of	Shortest slant	Distance	Average Height	Absorbent		Absorbent		Facade	Angle of	Angle of View			Combined
		Traffic Flow,	L _{10 (18-hour)}	Mean	Mean	HGV. n	Traffic Speed, V, and		Surface		horizontal	reception point	distance from the	Correction	of Propagation	Ground	Absorbent	Ground Cover	Propagation	Correction	view	Correction	Site Layout	Combined	Facade
Link	Receptor	Q veh/18-	dB(A) (CRTN	Speed. V	Speed, V	%**	Percentage Heavy	Road surface	Correction	Basic Noise Level dB(A)	distance. d	relative to	effective source	dB(A) (CRTN	H (m) (Para	Cover %	Ground	Correction	Correction	dB(A) (CRTN	segment. A	dB(A) (CRTN	Correction	Noise Level	Noise Level
		nour day**	Chart 3)	mph**	km/h		Vehicles, p (CRTN Chart 4)		(CRTN Para.		(m)	effective source	position, d' (m)	Chart 7)*	20.2 CRTN)	(Para 20.4	Cover, I	dB(A) (CRTN	dB(A)	Para. 26.1)	(deg)	Chart 10)	dB(A)	dB(A)	dB(A)
Top Street North	ESR4	14,969	70.9	60	96.5	1.6	2.5	Impervious (SMA)	-1	72.4	5.0	1.2	8.6	2.0	1.1	0.0	1.0	-1.2	0.8	2.5	180.0	0.0	2.5	75.7	
Top street north		14,909	70.5	. 30	50.5	1.0	2.2	pervious (SIVIA)	I	12.7	0.0	1.4	0.0	2.0	1 1.1	0.0	1.0	-1.2	0.0	2.5	100.0	0.0	2.5	75.7	75.7

Appendix 12.4 - CRTN Calculation - Proposed Receptors

* Valid for d ≥ 4 metres

** Values from Traffic Data provided by TTHC

values in our traine bata pro	maca by fine																								
Stage 1			Stage 2				Stage 2	Stage 2	2	Stage 2					Stage 3						SI		Stag	e 5	
Without Development 2025 Link	Receptor	Traffic Flow, Q veh/18- hour day**	L _{10 (18-hour)} dB(A) (CRTN Chart 3)	Traffic Mean Speed, V mph**	Speed Mean Speed, V km/h	HGV, p %**	Correction for Mean Traffic Speed, V, and Percentage Heavy Vehicles, p (CRTN Chart 4)	Road surface	Road Surface Correction (CRTN Para. 16)	Basic Noise Level dB(A)	Shortest horizontal distance, d (m)	Height of reception point relative to effective source position, h (m)	Shortest slant distance from the effective source position, d' (m) (CRTN Chart 7)	Distance Correction dB(A) (CRTN Chart 7)*	Average Height of Propagation, H (m) (Para 20.2 CRTN)	Absorbent Ground Cover % (Para 20.4 CRTN)	Absorbent Ground Cover, I	Absorbent Ground Cover Correction dB(A) (CRTN Chart 8)	Propagation Correction dB(A)	Façade Correction dB(A) (CRTN Para. 26.1)	Angle of view segment, θ (deg)	Angle of View Correction dB(A) (CRTN Chart 10)	Site Layout Correction dB(A)	Combined Noise Level dB(A)	Combined Façade Noise Level dB(A)
B1438 East of site access	PSR1	19,547	72.0	30	48.3	1.3	-2.4	Impervious (SMA)	-1	68.6	15.0	1.2	18.5	-1.4	1.1	≥90	1.0	-2.9	-4.3	2.5	150.0	-0.8	1.7	66.0	
																								66.0	66.0
With Development 2025						· · · ·																			
Link	Receptor	Traffic Flow, Q veh/18- hour day**	L _{10 (18-hour)} dB(A) (CRTN Chart 3)	Traffic Mean Speed, V mph**	Speed Mean Speed, V km/h	HGV, p %**	Correction for Mean Traffic Speed, V, and Percentage Heavy Vehicles, p (CRTN Chart 4)	Road surface	Road Surface Correction (CRTN Para. 16)	Basic Noise Level dB(A)	Shortest horizontal distance, d (m)	Height of reception point relative to effective source position, h (m)	Shortest slant distance from the effective source position, d' (m) (CRTN Chart 7)	Distance Correction dB(A) (CRTN Chart 7)*	Average Height of Propagation, H (m) (Para 20.2 CRTN)	Absorbent Ground Cover % (Para 20.4 CRTN)	Absorbent Ground Cover, I	Absorbent Ground Cover Correction dB(A) (CRTN Chart 8)	Propagation Correction dB(A)	Façade Correction dB(A) (CRTN Para. 26.1)	Angle of view segment, θ (deg)	Angle of View Correction dB(A) (CRTN Chart 10)	Site Layout Correction dB(A)	Combined Noise Level dB(A)	Combined Façade Noise Level dB(A)
B1438 East of site access	PSR1	19,651	72.0	30	48.3	1.3	-2.4	Impervious (SMA)	-1	68.6	15.0	1.2	18.5	-1.4	1.1	≥90	1.0	-2.9	-4.3	2.5	150.0	-0.8	1.7	66.0	66.0
																								66.0	0010
Without Development 2025																									
Link	Receptor	Traffic Flow, Q veh/18- hour day**	L _{10 (18-hour)} dB(A) (CRTN Chart 3)	Traffic Mean Speed, V mph**	Speed Mean Speed, V km/h	HGV, p %**	Correction for Mean Traffic Speed, V, and Percentage Heavy Vehicles, p (CRTN Chart 4)	Road surface	Road Surface Correction (CRTN Para. 16)	Basic Noise Level dB(A)	Shortest horizontal distance, d (m)	Height of reception point relative to effective source position, h (m)	Shortest slant distance from the effective source position, d' (m) (CRTN Chart 7)	Distance Correction dB(A) (CRTN Chart 7)*	Average Height of Propagation, H (m) (Para 20.2 CRTN)	Absorbent Ground Cover % (Para 20.4 CRTN)	Absorbent Ground Cover, I	Absorbent Ground Cover Correction dB(A) (CRTN Chart 8)	Propagation Correction dB(A)	Façade Correction dB(A) (CRTN Para. 26.1)	Angle of view segment, θ (deg)	Angle of View Correction dB(A) (CRTN Chart 10)	Site Layout Correction dB(A)	Combined Noise Level dB(A)	Combined Façade Noise Level dB(A)
B1438 West of site access	0000	19,023	71.9	30	48.3	1.8	-2.3	Impervious (SMA)	-1	68.6	70.0	1.2	73.5	-7.4	1.1	≥90	1.0	-6.0	-13.4	2.5	10.0	-12.6	-10.1	45.2	
Top Street North	PSKZ	14,969	70.9	60	96.5	1.6	2.5	Impervious (SMA)	-1	72.4	20.0	1.2	23.5	-2.4	1.1	≥90	1.0	-3.5	-5.9	2.5	170.0	-0.2	2.3	68.8	68.8
																		• •		•				68.8	1
																							,		
With Development 2025																									
Link	Receptor	Traffic Flow, Q veh/18- hour day**	L _{10 (18-hour)} dB(A) (CRTN Chart 3)	Traffic Mean Speed, V mph**	Speed Mean Speed, V km/h	HGV, p %**	Correction for Mean Traffic Speed, V, and Percentage Heavy Vehicles, p (CRTN Chart 4)	Road surface	Road Surface Correction (CRTN Para. 16)	Basic Noise Level dB(A)	Shortest horizontal distance, d (m)	Height of reception point relative to effective source position, h (m)	Shortest slant distance from the effective source position, d' (m) (CRTN Chart 7)	Distance Correction dB(A) (CRTN Chart 7)*	Average Height of Propagation, H (m) (Para 20.2 CRTN)	Absorbent Ground Cover % (Para 20.4 CRTN)	Absorbent Ground Cover, I	Absorbent Ground Cover Correction dB(A) (CRTN Chart 8)	Propagation Correction dB(A)	Façade Correction dB(A) (CRTN Para. 26.1)	Angle of view segment, θ (deg)	Angle of View Correction dB(A) (CRTN Chart 10)	Site Layout Correction dB(A)	Combined Noise Level dB(A)	Combined Façade Noise Level dB(A)
B1438 West of site access	DSD2	20,070	72.1	30	48.3	1.8	-2.3	Impervious (SMA)	-1	68.9	70.0	1.2	73.5	-7.4	1.1	≥90	1.0	-6.0	-13.4	2.5	10.0	-12.6	-10.1	45.4	68.8
Top Street North	1 5112	14,969	70.9	60	96.5	1.6	2.5	Impervious (SMA)	-1	72.4	20.0	1.2	23.5	-2.4	1.1	≥90	1.0	-3.5	-5.9	2.5	170.0	-0.2	2.3	68.8	00.0
																								68.8	
Without Development 2025	1	-						1							1					1					
Link	Receptor	Traffic Flow, Q veh/18- hour day**	L _{10 (18-hour)} dB(A) (CRTN Chart 3)	Traffic Mean Speed, V mph**	Speed Mean Speed, V km/h	HGV, p %**	Correction for Mean Traffic Speed, V, and Percentage Heavy Vehicles, p (CRTN Chart 4)	Road surface	Road Surface Correction (CRTN Para. 16)	Basic Noise Level dB(A)	Shortest horizontal distance, d (m)	Height of reception point relative to effective source position, h (m)	Shortest slant distance from the effective source position, d' (m) (CRTN Chart 7)	Distance Correction dB(A) (CRTN Chart 7)*	Average Height of Propagation, H (m) (Para 20.2 CRTN)	Absorbent Ground Cover % (Para 20.4 CRTN)	Absorbent Ground Cover, I	Absorbent Ground Cover Correction dB(A) (CRTN Chart 8)	Propagation Correction dB(A)	Façade Correction dB(A) (CRTN Para. 26.1)	Angle of view segment, θ (deg)	Angle of View Correction dB(A) (CRTN Chart 10)	Site Layout Correction dB(A)	Combined Noise Level dB(A)	Combined Façade Noise Level dB(A)
Sandy Lane	PSR3	1,840	61.7	30	48.3	6.1	-0.9	Impervious (SMA)	-1	59.9	10.0	1.2	13.6	0.0	1.1	≥90	1.0	-2.2	-2.2	2.5	180.0	0.0	2.5	60.2	60.2
																								60.2	0012
With Development 2025 Link	Receptor	Traffic Flow, Q veh/18- hour day**	L _{10 (18-hour)} dB(A) (CRTN Chart 3)	Traffic Mean Speed, V mph**	Speed Mean Speed, V km/h	HGV, p %**	Correction for Mean Traffic Speed, V, and Percentage Heavy Vehicles, p (CRTN Chart 4)	Road surface	Road Surface Correction (CRTN Para. 16)	Basic Noise Level dB(A)	Shortest horizontal distance, d (m)	Height of reception point relative to effective source position. h (m)	Shortest slant distance from the effective source position, d' (m) (CRTN Chart 7)	Distance Correction dB(A) (CRTN Chart 7)*	Average Height of Propagation, H (m) (Para 20.2 CRTN)	Absorbent Ground Cover % (Para 20.4 CRTN)	Absorbent Ground Cover, I	Absorbent Ground Cover Correction dB(A) (CRTN Chart 8)	Propagation Correction dB(A)	Façade Correction dB(A) (CRTN Para. 26.1)	Angle of view segment, θ (deg)	Angle of View Correction dB(A) (CRTN Chart 10)	Site Layout Correction dB(A)	Combined Noise Level dB(A)	Combined Façade Noise Level dB(A)
Sandy Lane	PSR3	1,729	61.5	30	48.3	6.1	-0.9	Impervious (SMA)	-1	59.6	10.0	1.2	13.6	0.0	1.1	≥90	1.0	-2.2	-2.2	2.5	180.0	0.0	2.5	59.9	
		2,725						20										1						59.9	59.9
		-																					L	5515	ı I

Drawing 12.1: Monitoring Locations



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NOISE MONITORING LOCATIONS NOISE MONITORING LOCATIONS DRG NO. DRG NO. CALE SCALE Date DRG NO. CALE 1:2500@A3 DATE 03/11/201 DRAWN BY C CHECKED BY APPROVED BY APPROVED BY C CHECKED BY CARDIFF TEL 039.23043 EIGH TEL 0194.2309 INNEWASTIE UPON TYNE TEL 0191.22.0943 SHEFFIELD TEL 0194.2309 INSET BROMWICH TEL 0191.23.0943 SHEFFIELD TEL 0114.24.63 INNEWASTIE UPON TYNE TEL 0127.287.287.2 TAUNTON TEL 0114.24.63 INNEWASTIE UPON TYNE TEL 0127.27.287.2 TAUNTON TEL 0114.24.63 INNEWASTIE UPON TYNE TEL 0127.27.287.2 TAUNTON TEL 0114.24.63 INNEWASTIE UPON TYNE TEL 0127.27.287.287.2 TAUNTON TEL 0113.153.33 INNEWASTIE UPON TYNE TEL 0127.27.287.2 TAUNTON TEL 013.153.33	GLADMAN DEVELOPMENTS	REVISION DEFALS DATE DRAWN CH	LEGEND: Monitoring Location & X
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Drawing 12.2: Existing and Proposed Receptors



^{re} Wardell your ea	DRG No. SCALE DAT LE12277-003 SCALE 1.2500@A3 DAT DRAWN BY LC HECKED BY APF Istoke-on-treent Tel. 0845 111 777 CARDIFF (IFAD OFFICE) Istoke-on-treent Istoke-on-treent Istoke-on-treent Insworkstle upon trive Tel. 0191 232 0943 Istoffellug Insworkstle upon trive Tel. 0191 232 0943 Istoffellug	WOODBRIDGE	GLADMAN DEVELOPME	REVISION DETAILS		\times \setminus	S\\ 1811\ 1		Ŷ ⊕ PSR	► ESR	LEGEND		DO NOT SCALE FROM THIS DR
rth our world	TE 03/11/2015 PROVED BY EG TEL 028 2072 9191 TEL 01942 260101 TEL 01942 260101 TEL 01942 6244 TEL 01943 703100	RS Ü	INTS	DATE DRAWN CHK'D APP'D				π				-	AWING A3