



TECHNICAL NOTE

DATE:	13 November 2025	CONFIDENTIALITY:	Public
SUBJECT:	Tyne Crossing Stage 4.3 Night-time Construction Noise Assessment		
PROJECT:	UK0028143.9550	AUTHOR:	James Dennis
CHECKED:	Esteban Olmos	APPROVED:	Esteban Olmos

INTRODUCTION

WSP has been instructed by National Grid to assess the construction noise impacts from construction of the tunnel under the River Tyne. This technical note assesses the potential impacts arising from the construction activities proposed during the night-time period only. The note has been prepared in response to the queries raised by the Environmental Health Officer (EHO) at South Tyneside Council.

SURVEY

Study Area

This technical note presents a noise assessment of the night-time construction noise from the construction of the tunnel under the River Tyne on nearby noise sensitive receptors (NSRs). The study area for selection of NSRs is a 1km buffer from the tunnel shaft terminations.

Methodology

A noise survey was conducted between 18th and 20th August 2025. This survey was conducted using one unattended long-term meter (LT1) and attended short-term measurements at five different locations (ST1 – ST5) within the study area. The measurement locations are summarised below in Table 1.

Table 1 – Noise Survey Locations

ID	W3W	BNG	Height	Period	Start time(s)
LT1	///gets.jaws.simple	433986 E, 566301 N	1.5m	16.25 hours	18/08/2025 14:00
ST1	///teams.upon.known	433913 E, 565218 N	1.5m	1x 15 minutes	10:24, 10:49, 14:19, 16:16
ST1.5	///repay.zoom.poems	433927 E, 565359 N	1.5m	4x 15 minutes	11:46
ST2	///clouds.keeps.stuff	433506 E, 564993 N	1.5m	4x 15 minutes	09:43, 11:22, 13:55, 16:41
ST3	///heads.reason.facing	433832 E, 565584 N	1.5m	4x 15 minutes	10:05, 10:29, 14:40, 15:52
ST4	///carbon.loyal.gentle	433400 E, 566732 N	1.5m	4x 15 minutes	09:58, 10:50, 13:19, 17:16
ST5	///trader.worker.thank	433915 E, 566988 N	1.5m	4x 15 minutes	09:10, 12:15, 14:53, 15:11

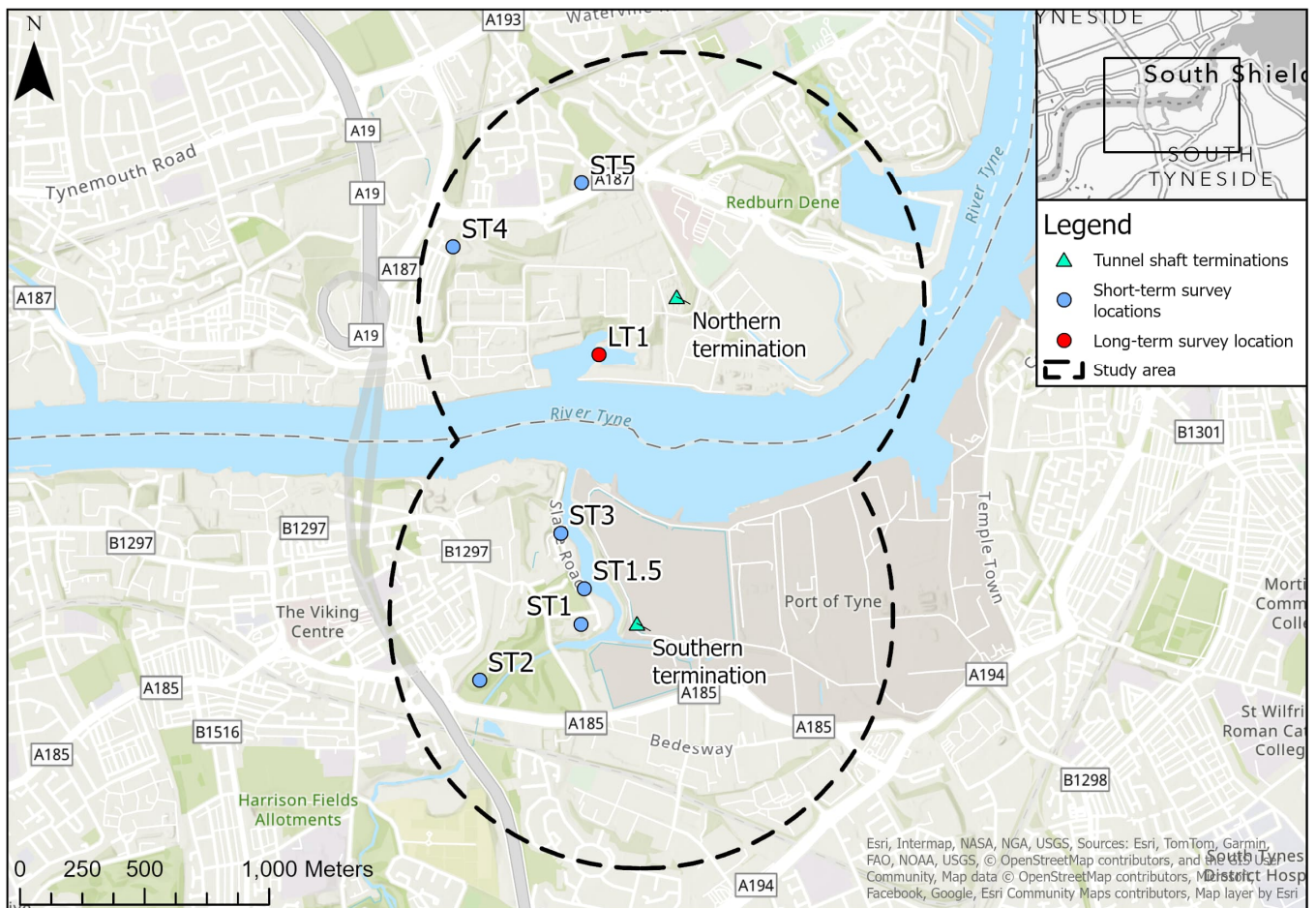
The study area and survey locations are presented in Figure 1.

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Figure 1 – Study Area and Survey Locations



The noise survey was conducted with Class 1 sound level meters calibrated before and after measurements with no significant drift recorded. An accredited laboratory calibrated the equipment not more than two years prior to the measurements being carried out, with the exception of the calibrator which had been calibrated not more than one year prior to the measurements being taken.

At each measurement position, the microphones were protected by windshields throughout the measurement period.

Measurement Results

Only the long-term measurement results are presented in this technical note as these results have been used to inform the worst-case night-time noise levels for the NSRs. These results are summarised in Table 2.

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Table 2 – Summary Noise Measurement Results: Long-term Continuous Unattended

Location	Period, T	Measured sound level*, dB		
		$L_{Aeq,T}$	Range, $L_{Amax,T}$	Representative** $L_{A90,T}$
LT1	Weekday daytime (0700 - 1900 hrs)	45	56 - 74	43
	Evening (all days) (1900 - 2300 hrs)	43	49 - 64	42
	Night-time (all days) (2300 - 0700 hrs)	44	45 - 67	42
* - Excluding periods with unfavourable weather conditions and unrepresentative events.				
** - 30 th percentile of measured $L_{A90,T}$ sound levels.				

NOISE MODEL

A preliminary noise model has been built to predict the construction noise from activities undertaken at the surface around the tunnel termination at the locations shown in Figure 1.

Assumptions and Limitations

Calculation Configuration

- The noise modelling has been undertaken using CadnaA (DataKustik, 2025) in accordance with BS 5228-1:2009+A1:2014 (British Standards Institute, 2014).
- The ground is considered to be 50% soft ground; the value for ground absorption is set to 0.5.
- The order of reflections is set to 2.
- The noise levels have been predicted at first floor level at the NSRs as free-field values.

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Data

- The noise source of the northern and southern night-time construction works is modelled to L_{WA} 112 dB as point sources located at the terminations of the shaft. These source levels come from the table of construction plant in Appendix A: Construction Plant. This is the plant that is used above ground and at night.
- The topography of the study area has been derived from the National LIDAR Programme 1m Composite DTM 2022¹. The topography used in the model extends a further 1km from the study area.

Noise Model Results

The results of the preliminary noise model are presented in Table 3. The results are free-field values calculated at a height of 4m. The table shows the worst-case prediction at dwellings within the study area.

Table 3 – Noise Model Results

Representative Receptor	Predicted Sound Pressure Level, L_{Aeq} dB	X	Y	Nearest tunnel termination	Distance from nearest tunnel termination (m)
St Stephen's Way	43	433568	566895	North	834
Nelson Terrace	45	433808	566970	North	666
Chatton Street	42	433324	566531	North	973
Quay Corner Avenue	48	433812	565511	South	420
Wellington Place	44	433466	565394	South	689
Newlyn Drive	43	433714	564686	South	690

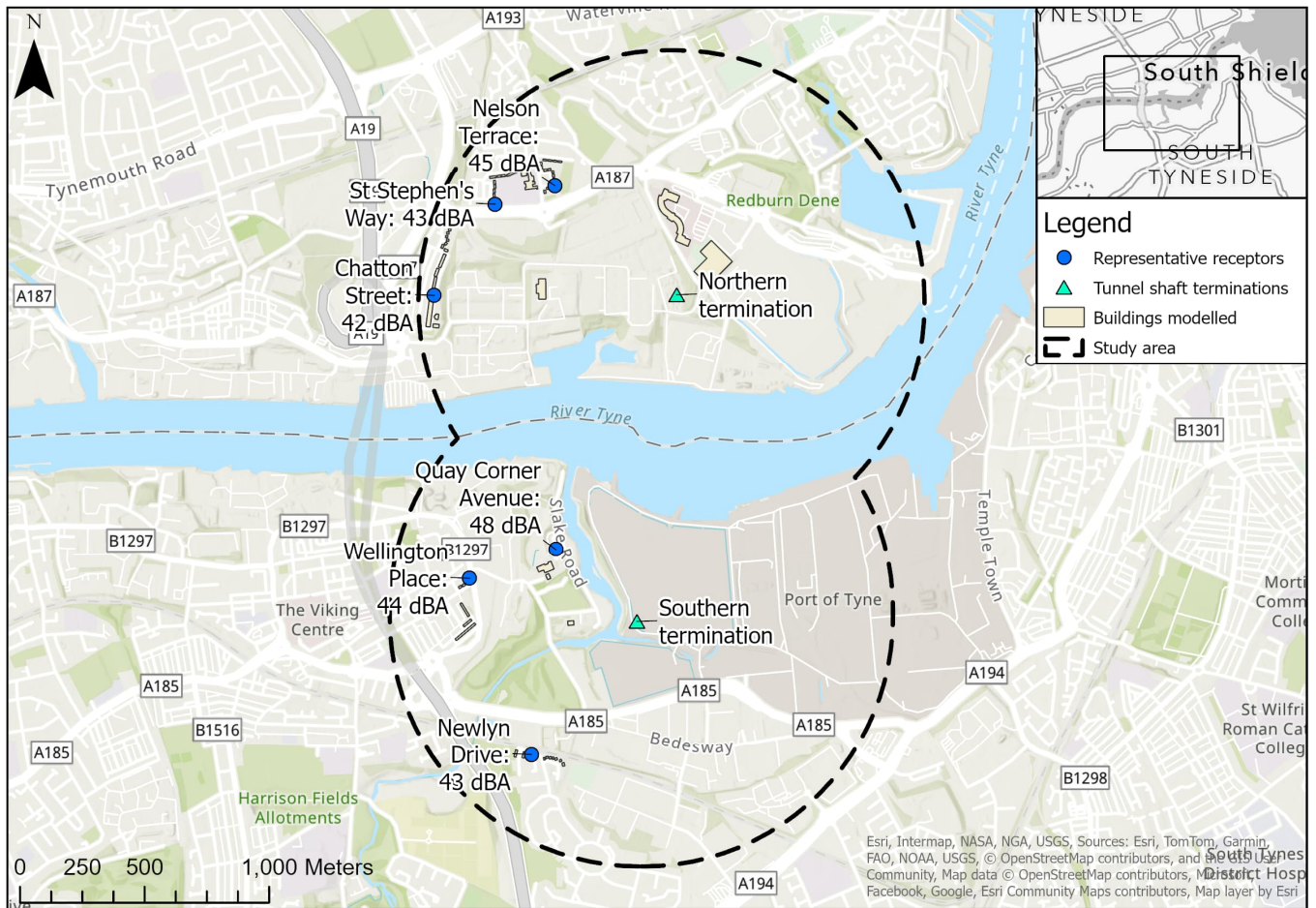
The locations of the representative receptors are presented in Figure 2.

¹ National LIDAR Programme 1m Composite DTM 2022, Environment Agency, available online at [Defra Survey Data Download](#)

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Figure 2 – Representative Receptor Locations



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BS 5228 ASSESSMENT

At this stage, an initial impact assessment has been conducted in accordance with BS 5228 ABC method outlined in Annex E.3.2 (British Standards Institute, 2014, p. 119).

From the measured night-time data collected at LT1, the assessment category and threshold value for night-time are:

- Category B
- $L_{Aeq,8h}$ 50 dB during night-time

Potential Impacts and Mitigation

The construction noise levels predicted at the nearest NSRs are generally below the construction noise threshold. The NSR predicted to experience the highest night-time construction noise impacts, at 2 dB below the threshold value, is Quay Corner Avenue at $L_{Aeq,8h}$ 48 dB, located approximately 420m from the southern termination.

It is recommended that best practicable means are employed to minimise the potential for construction noise impact at night-time at both ends of the scheme to reduce the noise impact at this receptor and other receptors in the north and south. Examples of such measures are indicated below:

- Selection of quiet and low noise equipment and methodologies
- Acoustic screening, localised noise barriers around main items of plant operated at the surface, to minimise noise adverse effects
- Optimal location of equipment on site to minimise noise adverse effects



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APPENDIX A: CONSTRUCTION PLANT

Table 4 – Construction Plant Table

Activity	BS5228 Reference	BS5228 Construction Type	BS5228 Activity	Plant Description	LAeq @ 10m, dB	Corrected LAeq @ 10m, dB	No.	% Use / on-time
Northern works								
Transformers to power the Tunnel Boring Machine	C4.85	General Site Activities	Power for welder	Diesel generator; 4kW; 18 kg	66	66	1	100
Shaft and tunnel ventilation fans; (All the time work is underway below ground)	n/a	Zitron ventilation fans with silencer (single fan operating)			77	77	1	100
Battery charging units; (Used to charge loco batteries so in use the whole time)	C4.76	General Site Activities	Power for site cabins	Diesel generator; 6.5kW	61	58	1	50
Crawler cranes (perhaps used to lower equipment into the shaft 25% of time)	C4.39	General Site Activities	Lifting	Mobile telescopic crane; 315kW; 80 t	77	71	1	25
	C4.40	General Site Activities	Lifting	Mobile telescopic crane (idling); 315kW; 80 t	66	60	1	25
Grout batching plant and grout silos; (used to batch grout loads when tunnel is working)	C4.23	General Site Activities	Mixing concrete	Small cement mixer; 2kW	61	58	1	50
Slurry treatment; (assumed just for shaft sinking at the moment)	C4.88	General Site Activities	Pumping water	Water pump (diesel); 10kW; 100 kg	68	68	1	100
Gantry cranes; (For moving segments around the site and perhaps down the shaft – used every 30 to 60mins)	C4.48	General Site Activities	Lifting	Tower crane; 88kW; 22 t	76	73	1	50
Compressed air compressors and air receivers; and (all the time)	C3.19	Piling and Ancillary Operations	Rotary bored piling – cast in situ	Compressor for mini piling; 45kW; 1 t	75	75	1	100
Spoil removal conveyors. (For every ring build – used every 30 to 60mins)	C10.20	Other quarries	Field conveyor system	Conveyor drive unit; 42kW	77	74	1	50
						82	Total SPL (dBA)	
						110	Total SWL (dBA)	
Southern works								
Shaft and tunnel ventilation fans; (All the time work is underway below ground)	n/a	Zitron ventilation fans with silencer			77	77	1	100
Crawler cranes (perhaps used to lower equipment into the shaft 25% of time)	C4.39	General Site Activities	Lifting	Mobile telescopic crane; 315kW; 80 t	77	71	1	25
	C4.40	General Site Activities	Lifting	Mobile telescopic crane (idling); 315kW; 80 t	66	60	1	25
Grout batching plant and grout silos; (used to batch grout loads when tunnel is working)	C4.20	General Site Activities	Mixing concrete	Concrete mixer truck	80	77	1	50
Compressed air compressors and air receivers; and (all the time)	C3.19	Piling and Ancillary Operations	Rotary bored piling – cast in situ	Compressor for mini piling; 45kW; 1 t	75	75	1	100
						82	Total SPL (dBA)	
						110	Total SWL (dBA)	