

TECHNICAL NOTE

Transpennine Route Upgrade – Thornhill Road Works

SUBJECT

Noise & Vibration Assessment

PROJECT NO.

100099912

DATE

14/01/2026

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Document history

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1. Introduction

AtkinsRéalis has been commissioned by Network Rail to undertake construction noise and vibration predictions for works associated at Thornhill Road as part of the Transpennine Route Upgrade (TRU) project. These predictions will be used to support an application for prior consent with Kirklees Council under Section 61 of the Control of Pollution Act 1974. This technical note provides a summary of the predictions of noise levels at nearby noise sensitive receptors (NSRs) and assessment of the proposed works, undertaken in accordance with BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise' (BS 5228-1).

There are no significant sources of vibration proposed for the works, with the exception of vibratory rolling. It is assumed that dead rolling is undertaken in close proximity (within approximately 10m) to NSRs to avoid significant adverse effects. Vibration is therefore scoped out of the assessment.

2. Guidance

2.1 Construction Noise

The Noise Policy Statement for England (NPSE) sets out the long-term vision of government noise policy to promote good health and a good quality of life through the effective management of noise within the context of government policy on sustainable development.

The NPSE outlines three aims for the effective management and control of environmental, neighbour and neighbourhood noise:

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life; and
- Where possible, contribute to the improvement of health and quality of life.

In its aims, the NPSE uses the key phrases 'significant adverse' and 'adverse'. The NPSE states in its explanatory note that there are two established concepts that are currently being applied to noise impacts, which are:

- NOEL – No Observed Effect Level. This is the level below which no effect can be detected; and
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected.

The NPSE then extends this concept to include:

- SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.

The NPSE notes that it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to vary for different noise sources, receptors and times. Relevant SOAELs have been identified for the Scheme, taking account of the sources of exposure and receptors.

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Although there are no statutory construction noise limits, BS 5228-1 provides example criteria for deriving appropriate construction noise significance criteria. The standard explains that the assessor needs to consider other Scheme-specific factors, such as the number of receptors affected and the duration and character of the impact, to determine if there is a significant effect.

The SOAEL pertinent to construction noise is considered to be exceeded where the threshold values in Table 1 are exceeded based on the example criteria provided in Table E.2 of BS 5228-1, or where the ambient sound level is exceeded by 5 dB, whichever is higher.

Table 1 Examples of time periods, averaging times and noise levels associated with the determination of eligibility for noise insulation

Day	Time (hours)	Averaging period, T	Noise insulation trigger level, dB $L_{Aeq,T}$
Mondays to Fridays	0700 – 0800	1 hour	70
	0800 – 1800	10 hours	75
	1800 – 1900	1 hour	70
	1900 – 2200	1 hour	65
	2200 – 0700	1 hour	55
Saturdays	0700 – 0800	1 hour	70
	0800 – 1300	5 hours	75
	1300 – 1400	1 hour	70
	1400 – 2200	1 hour	65
	2200 – 0700	1 hour	55
Sundays and Public Holidays	0700 – 2100	1 hour	65
	2100 – 0700	1 hour	55

^{A)} All noise levels are predicted or measured at a point 1m in front of the most exposed of any windows and doors in any façade of any eligible dwelling

A significant adverse effect shall be identified where SOAEL thresholds are exceeded for either of the following durations, as per BS 5228-1:

- A period of 10 or more days of working in any 15 consecutive days during construction; or
- For a total of 40 days or more in any 6 consecutive months during construction.

Significant adverse effects are deemed to occur at NSRs where both the SOAEL, as detailed in Table 1, and temporal criteria stated above are exceeded.

Network Rail will offer noise insulation or temporary rehousing if the effects of construction noise at NSRs are expected to be significant, in accordance with the criteria detailed above, and all reasonable measures to reduce noise have been incorporated.

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NSRs considered for noise insulation or temporary rehousing will be regarded as 'eligible' NSRs. Those NSRs which are then deemed to be entitled to noise insulation or temporary rehousing, will be regarded as 'qualifying' NSRs. Calculations have been conducted to predict construction noise levels at all NSRs in the study area due to the works. NSRs that may experience significant adverse effects and would therefore be eligible have been highlighted.

3. Noise Calculations

3.1 Activities

The proposed works include the following activities:

- Thornhill Road/Fall Lane Works:
 - Activity 1 – Saw cut, break out and remove surfacing and transport to stockpile;
 - Activity 2 – Excavate and lay sand bedding, ducting and sand surround;
 - Activity 3 – Excavate and place duct boxes to level on sand bed;
 - Activity 4 – Backfill ducting and boxes with Type 1 MOT;
 - Activity 5 – Compact the Type 1 in 150mm layers and 6 passes of a wacker plate;
 - Activity 6 – Hand lay 50mm hot asphalt binder on Type 1 and compact with wacker plate; and
 - Activity 7 – Pulling cables with cable puller.
- Thornhill Road Bridge Works:
 - Activity 8 – Construct piling mat;
 - Activity 9 – Mining mitigation works;
 - Activity 10 – Install concrete piles;
 - Activity 11 – Build bridge abutments;
 - Activity 12 – Lift abutment shutters into place (Mon to Fri 20 Nights); and
 - Activity 13 – Build crane mat and lift bridge deck into place (1 week).
- Occupation Bridge Works:
 - Activity 14 – Arch infill.

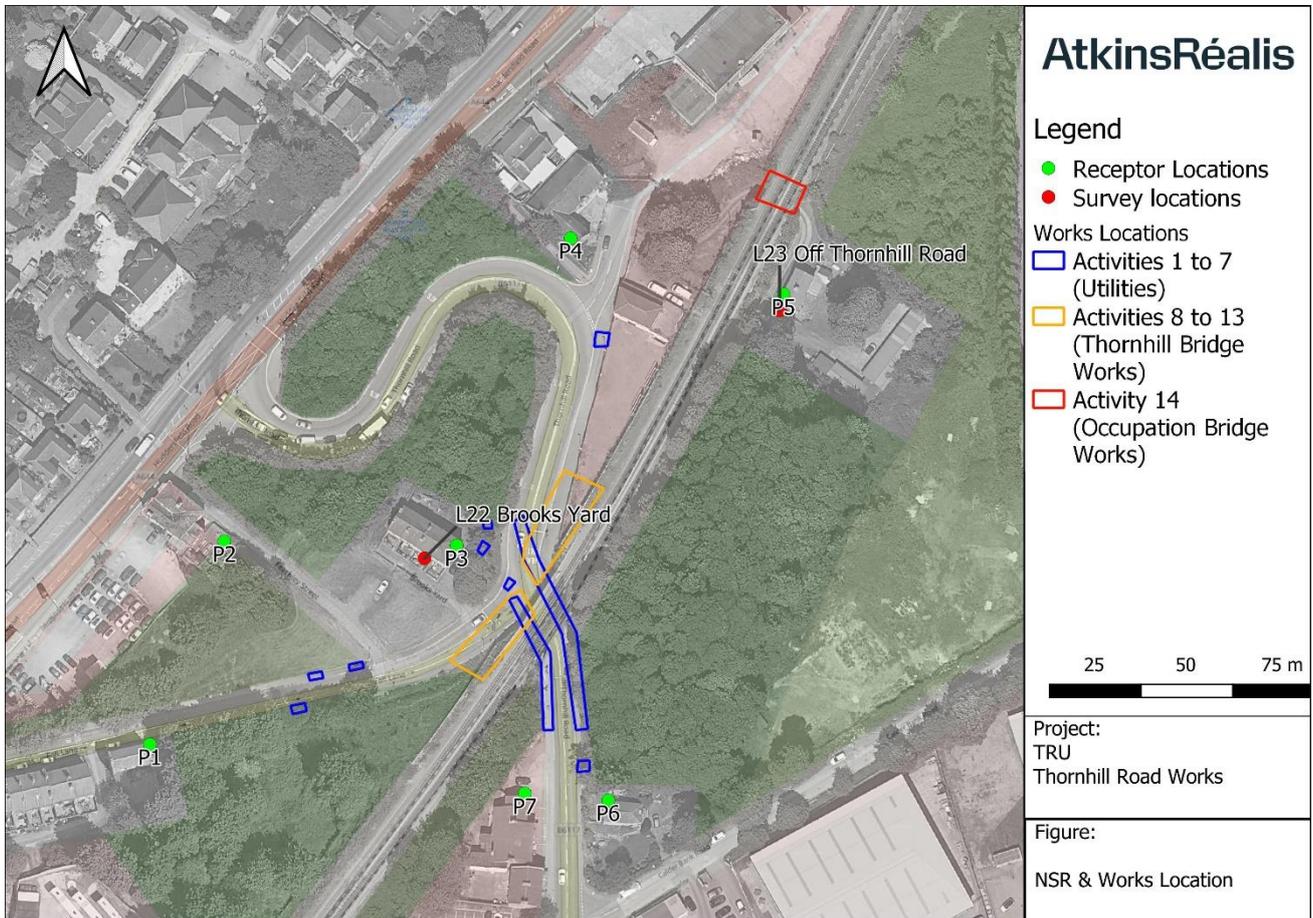
The two sites are located at:

- Thornhill Road/Fall Lane Dewsbury, WF13 2SW (what3Words: ///twin.exam.nets); and
- Occupation Bridge, off Thornhill Road, Dewsbury, WF13 2SN (what3Words: ///spun.bubble.cheer).

Figure 1 below shows the general works locations and nearest NSR locations, and noise survey locations.

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Figure 1 Plan of Works Areas, NSR Locations, and Survey Locations



3.2 Baseline Sound Levels

Baseline sound level measurements have been undertaken at two locations in the area, representative of nearby NSRs, as shown in Figure 1 as part of the Environmental Statement (ES)¹. A summary of the measured sound levels is provided in Table 2.

Table 2 Summary of Measured Sound Levels

Location	Time period	Average, dB L _{Aeq,15min}	Maximum, dB L _{AFmax,15min}	Background, dB L _{A90,15min}
L 22 – Brooks Yard	Daytime	50 - 76 Average: 62	59 - 101 Typical: 79	41 - 67 Typical: 52
	Night-time	41 - 62 Average: 54	51 - 86 Typical: 79	34 - 54 Typical: 46
L 23 – Thornhill Road	Daytime	45 - 63 Average: 54	63 - 89 Typical: 76	38 - 51 Typical: 44
	Night-time	36 - 55 Average: 49	43 - 82 Typical: 75	31 - 47 Typical: 38

3.3 Construction Plant Data

It is understood that the construction plant listed in Table 3 are required for each activity stated. Noise source levels have been obtained from BS 5228-1 unless stated otherwise and used to predict the overall noise level attributable to each activity.

Table 3 Construction Plant Data

Plant	BS5228 Reference	dB L _{Aeq,T} at 10m	Number in use	% on-time	Total activity sound level at 10m, dB L _{Aeq,T}
Activity 1 - Saw cut and break out footpath surfacing and remove to stockpile (1/2 Hour)					
1.5T Excavator	C.3.20	68	2	5	72
Floor Saw	C.4.72	79	2	5	
1T Mini Dumper	C.4.3	76	2	5	
LED Lighting Towers	C.4.86	65	2	50	
Activity 2 - Excavate and lay sand bedding, ducting and sand surround (3 Hours)					

¹ [Ch08 Noise and Vibration - App 8.1-8.3.pdf \(windows.net\)](#)

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Plant	BS5228 Reference	dB L _{Aeq,T} at 10m	Number in use	% on-time	Total activity sound level at 10m, dB L _{Aeq,T}
1.5T Excavator	C.3.20	68	2	50	77
1T Mini Dumper	C.4.3	76	2	50	
LED Lighting Towers	C.4.86	65	2	50	
Activity 3 - Excavate and place duct boxes to level on sand bed (2 Hour)					
1.5T Excavator	C.3.20	68	2	30	75
1T Mini Dumper	C.4.3	76	2	30	
LED Lighting Towers	C.4.86	65	2	50	
Activity 4 - Backfill ducting and boxes with Type 1 MOT (1/2 Hour)					
1.5T Excavator	C.3.20	68	2	15	72
1T Mini Dumper	C.4.3	76	2	15	
LED Lighting Towers	C.4.86	65	2	50	
Activity 5 - Compact the Type 1 in 150mm layers and 6 passes of a wacker plate (2 Hours)					
Wacker Plate	C.2.41	80	2	25	78
LED Lighting Towers	C.4.86	65	2	50	
Activity 6 - Hand lay 50mm hot asphalt binder on Type 1 and compact with wacker plate (1/2 Hour)					
8 Wheeler with Hot Box	C.5.30	75	2	5	72
Wacker Plate	C.2.41	80	2	5	
LED Lighting Towers	C.4.86	65	2	50	
Activity 7 - Pull cables through ducts – Quiet operation (8 Hours)					
Cable Drum and Cable Puller	Library data	55	2	70	66
LED Lighting Towers	C.4.86	65	2	50	
Activity 8 - Construct Piling Mat (West Abut. 3 weeks, East Abut. 3 weeks on days)					
13T Excavator	C.2.25	69	1	75	77
13T Roller	C.2.38	74	1	75	
9T Hydrema	C.4.4	76	1	60	
LED Lighting Towers	C.4.86	65	2	50	
Activity 9 - Mining Mitigation Works (West Abut. 3 weeks, East Abut. 3 weeks on days)					
Borehole Drilling Rig	C.3.18	75	1	75	79
Static Concrete Pump	C.4.26	75	1	75	
9T Hydrema	C.4.4	76	1	50	
LED Lighting Towers	C.4.86	65	2	50	

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Plant	BS5228 Reference	dB L _{Aeq,T} at 10m	Number in use	% on-time	Total activity sound level at 10m, dB L _{Aeq,T}
Activity 10 - Install Concrete Piles (West Abut. 3 weeks, East Abut. Maximum 8 nights over 3 weeks)					
Piling Rig (rotary auger)	C.3.17	76	1	50	77
30T Crane	C.4.43	70	1	50	
13T Excavator	C.2.25	69	1	50	
9T Hydrema	C.4.4	76	1	30	
LED Lighting Towers	C.4.86	65	2	50	
Activity 11 - Build Bridge Abutments (West Abut. 8 weeks, East Abut. Maximum 6 nights over 8 weeks)					
30T Crane	C.4.43	70	1	50	74
Concrete Pump	C.3.26	75	1	20	
13T Excavator	C.2.25	69	1	10	
Disc Cutter	C.4.72	79	1	5	
Circular Saw	C.4.72	79	1	5	
LED Lighting Towers	C.4.86	65	2	50	
Activity 12 - Lift Abutment Shutters into place					
30T Crane	C.4.43	70	1	40	
Activity 13 - Build Crane Mat and Lift Bridge Deck into Place with road closure (1 week)					
750T Crane	C.4.50	71	1	10	77
13T Excavator	C.2.25	69	1	50	
13T Roller	C.2.38	74	1	50	
9T Hydrema	C.4.4	76	1	40	
LED Lighting Towers	C.4.86	65	2	50	
Activity 14 - Occupation Bridge (MDL 1/10) Arch Infill					
9T Excavator	C.2.25	69	1	30	77
10T Roller	C.2.38	74	1	20	
9T Dual View Dumper	C.4.4	76	1	40	
Concrete Pump	C.3.26	75	1	50	
Telehandler	C.2.35	71	1	60	
LED Lighting Towers	C.4.86	65	2	40	

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3.4 Works Programme

The proposed activities are due to take place on and between the following indicative dates and times:

Table 4 Indicative Works Programme

Activity	Day/Night	Dates
Thornhill Road and Fall Lane works:		
Activity 1 – Saw cut, break out and remove surfacing and transport to stockpile;	Day and night	Days: 26 January to 30 March 2026, Monday to Friday
Activity 2 – ; Excavate and lay sand bedding, ducting and sand surround;		Nights:
Activity 3 – Excavate and place duct boxes to level on sand bed;		26 January to 13 February 2026, Monday to Friday (Virgin, City Fibre, NPG Utilities)
Activity 4 – Backfill ducting and boxes with Type 1 MOT;		16 February to 6 March 2026, Monday to Friday (BT Utility)
Activity 5 – Compact the Type 1 in 150mm layers and 6 passes of a wacker plate;		
Activity 6 – Hand lay 50mm hot asphalt binder on Type 1 and compact with wacker plate; and		
Activity 7 – Pulling cables with cable puller.	Day and night	Days: 1 February to 31 May 2026
		Nights: 16 to 27 February 2026, Monday to Friday (Virgin, City Fibre, NPG Utilities) 9 March to 20 March 2026, Monday to Friday (BT Utility)
Thornhill Road Bridge works:		
Activity 8 – Construct Piling Mat	Day	1 March 31 to May 2026, Monday to Friday
Activity 9 – Mining Mitigation Works	Day	1 March to 30 June 2026, Monday to Friday
Activity 10 – Install Concrete Piles	Day	1 March to 30 June 2026, Monday to Friday
	Night	20 April to 1 May 2026, Monday to Saturday

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Activity 11 – Build Bridge Abutments	Day	1 May to 31 November 2026, Monday to Friday
Activity 12 – Lift Abutment Shutters into place	Day	1 to 26 September 2026, Monday to Friday
	Night	15 to 26 June 2026, and 14 to 25 September, Monday to Friday
Activity 13 – Build Crane Mat and Lift Bridge Deck into Place (1 week).	Day	1 to 15 September 2026, Monday to Friday
	Night	54 hour possessions from 5 and 12 September 2026 (Friday night to Monday morning)
Occupation Bridge works:		
Activity 14 – Arch Infill	Day	January 2025 to March 2026 Monday to Saturday

3.5 Resultant Noise Levels at Receptors

Noise levels have been predicted at the nearest NSRs in accordance with BS 5228-1. Predictions assume all plant are operating simultaneously in line with their % operating times. The calculations assume that mitigation, such as localised screening, is included:

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Table 5 Construction Noise Results

Activity	Time Period of Works	Predicted Activity Noise Level, dB L _{Aeq,T} at Receptor						
		P1	P2	P3	P4	P5	P6	P7
Daytime SOAEL Threshold		75	75	75	75	75	75	75
Night-time SOAEL Threshold		59*	59*	59*	59*	55	59*	59*

*increased due to high existing ambient level

Key:

No Exceedance	Daytime Exceedance Only	Night-time Exceedance Only	Day- and Night-time Exceedance
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Thornhill Road and Fall Lane works:

Activity 1 – Saw cut, break out and remove surfacing and transport to stockpile	Day and Night	49	49	53	53	48	53	53
Activity 2 – Excavate and lay sand bedding, ducting and sand surround	Day and Night	54	54	58	58	53	58	58
Activity 3 – Excavate and place duct boxes to level on sand bed	Day and Night	52	52	56	56	51	56	56
Activity 4 – Backfill ducting and boxes with Type 1 MOT	Day and Night	49	49	53	54	48	54	54
Activity 5 – Compact the Type 1 in 150mm layers and 6 passes of a wacker plate	Day and Night	54	54	58	59	53	59	59

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Activity	Time Period of Works	Predicted Activity Noise Level, dB L _{Aeq,T} at Receptor						
		P1	P2	P3	P4	P5	P6	P7
Daytime SOAEL Threshold		75	75	75	75	75	75	75
Night-time SOAEL Threshold		59*	59*	59*	59*	55	59*	59*
*increased due to high existing ambient level								
Key:								
		No Exceedance	Daytime Exceedance Only	Night-time Exceedance Only			Day- and Night-time Exceedance	
Activity 6 – Hand lay 50mm hot asphalt binder on Type 1 and compact with wacker plate	Day and Night	49	49	53	54	48	54	54
Activity 7 – Pulling cables with cable puller	Day and Night	43	43	46	47	42	47	47
Thornhill Road Bridge works:								
Activity 8 – Construct Piling Mat	Day only	51	52	59	52	51	54	56
Activity 9 – Mining Mitigation Works	Day only	52	53	60	54	52	55	57
Activity 10 – Install Concrete Piles	Day and Night	50	51	58	52	50	53	55
Activity 11 – Build Bridge Abutments	Day only	47	49	55	49	48	50	53
Activity 12 - Lift Bridge Abutment shutters	Day and Night	40	42	48	42	41	43	46

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Activity	Time Period of Works	Predicted Activity Noise Level, dB L _{Aeq,T} at Receptor							
		P1	P2	P3	P4	P5	P6	P7	
Daytime SOAEL Threshold		75	75	75	75	75	75	75	
Night-time SOAEL Threshold		59*	59*	59*	59*	55	59*	59*	
*increased due to high existing ambient level									
Key:									
		No Exceedance		Daytime Exceedance Only		Night-time Exceedance Only		Day- and Night-time Exceedance	
Activity 13 – Build Crane Mat and Lift Bridge Deck into Place (1 week).	Day and Night	54	57	66	56	51	54	55	
Occupation Bridge works:									
Activity 14 – Arch Infill	Day only	48	50	53	63	70	51	50	
Highest Cumulative Noise Level:	Day	61	62	67	65	71	65	66	
	Night	54	57	66	59	53	59	59	
Highest number of exceedances in 15 consecutive days/nights (Temporal threshold ≥10 in 15 days)	Day	0	0	0	0	0	0	0	
	Night	0	0	6	0	0	0	0	

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Activity	Time Period of Works	Predicted Activity Noise Level, dB L _{Aeq,T} at Receptor						
		P1	P2	P3	P4	P5	P6	P7
Daytime SOAEL Threshold		75	75	75	75	75	75	75
Night-time SOAEL Threshold		59*	59*	59*	59*	55	59*	59*

*increased due to high existing ambient level

Key:

		No Exceedance	Daytime Exceedance Only	Night-time Exceedance Only	Day- and Night-time Exceedance
Highest number of exceedances in 6 consecutive months (Temporal threshold ≥40 in six months)	Day	0	0	0	0
	Night	0	0	6	0

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This assessment indicates that the SOAEL would not be exceeded at nearby NSRs during daytime works, but would be exceeded at nearby NSRs during some of the night-time works. However, the night-time SOAEL exceedances would not occur for a duration exceeding the temporal thresholds for significant adverse effects (see 2.1, above). The works would therefore not lead to a requirement for noise insulation or temporary rehousing at any nearby NSR.

Although significant adverse effects are not expected, noise levels due to the works may still lead to disturbance at nearby NSR. A range of mitigation measures and Best Practicable Means (BPM) to reduce construction noise and its effects, as far as reasonably practicable, are therefore recommended in Section 4.

4. Noise Control Measures

In carrying out the works, Network Rail and its contractors will ensure all reasonable steps will be implemented in the design and construction of the Scheme so that noise from the construction does not exceed noise thresholds presented in Table 1. Where it is not reasonably practicable to achieve this objective, noise and vibration from construction will be reduced as far as is reasonably practicable.

In developing the control measures, BPM (as defined in Section 72 of the Control of Pollution Act 1974 and Section 79 of the Environmental Protection Act 1990) will be applied during all construction works to minimise noise and vibration at neighbouring residential properties and other sensitive receptors. In doing so, due consideration will be given to the recommendations contained within BS5228:2009+A1:2014, approved by the Secretary of State as the Code of Practice for noise and vibration control on construction and open sites.

The following control measures will therefore be implemented in carrying out the construction works:

- The works are likely to exceed the noise level SOAEL thresholds for certain activities, and cumulatively for a number of activities occurring simultaneously. Should the works programme vary compared to the indicative programme provided in Table 4, works will be coordinated such that the noise level SOAEL will not be exceeded for a duration exceeding the temporal criteria for potential significant effects; namely:
 - A period of 10 or more days of working in any 15 consecutive days during construction; or
 - For a total of 40 days or more in any 6 consecutive months during construction.
- All plant and equipment will comply with the noise limit and noise marking requirements prescribed by the “Noise Emission in the Environment by Equipment for Use Outdoors Regulations 2001” and the “Noise Emission in the Environment by Equipment for Use Outdoors (Amendment) Regulations 2005” implementing the EU Directives 2000/14/EC.
- All plant, equipment and noise control measures applied to plant and equipment shall be maintained in good and efficient working order and operated such that noise emissions are minimised as far as reasonably practicable. As far as reasonably practicable, any plant, equipment or items fitted with noise control equipment found to be defective will not be operated until repaired.
- All generators shall be super-silenced units. Where reasonably practicable, other fixed items of construction plant should be electrically powered in preference to diesel or petrol driven.
- Vehicles and mechanical plant employed for any activity associated with the construction works will, where reasonably practicable, be fitted with effective exhaust silencers and shall be maintained in good

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working order and operated in a manner such that noise emissions are controlled and limited as far as reasonably practicable.

- Machines in intermittent use will be shut down or throttled down to a minimum during periods between works.
- Whenever used, all percussion tools shall be fitted with appropriate mufflers or dampers of the type recommended by the manufacturers.
- Static noise emitting equipment operating continuously (generators, compressors etc) will be screened or housed within suitable acoustic enclosure, where appropriate.
- Noisy plant or equipment shall be sited as far away as possible from noise sensitive buildings. Wherever practicable, the use of barriers in the form of acoustic enclosures or temporary noise barriers shall be employed.
- All personnel on site will undergo site specific inductions and briefings, to include Section 61 consent requirements and noise control measures. Where relevant, specific noise control measures will be incorporated into Works Package Plans.
- A programme of community liaison will be carried out, including notification of works and details of the complaints process.
- A programme of site inspections and noise monitoring will be carried out to assess whether BPM is being employed in the control noise, to investigate any noise complaints or incidents and compare actual construction noise levels against those predicted in the Section 61 consent application.
- Noise from reversing alarms from delivery and construction vehicles will be controlled and limited as far as possible through the following means:
 - Designing the site layout to limit the need for reversing vehicles;
 - The use of bankspersons for traffic management at site entrance gates and within site footprint;
 - Reversing alarms incorporating directional sounders, broadband signals self-adjusting output sounders or flashing warning lights; and
 - Setting reversing alarms to the minimum output noise level required for health and safety compliance.
- It is assumed that dead rolling is undertaken in close proximity (within approximately 10m) to NSRs to avoid significant adverse effects

5. Conclusions

AtkinsRéalis has been commissioned by Network Rail to undertake construction noise and vibration predictions for works associated at Thornhill Road as part of the Transpennine Route Upgrade (TRU) project.

This assessment indicates that the SOAEL would not be exceeded at nearby NSRs during daytime works, but would be exceeded at nearby NSRs during some of the night-time works. However, the night-time SOAEL exceedances would not occur for a duration exceeding the temporal thresholds for significant adverse effects (see 2.1, above). The works would therefore not lead to a requirement for noise insulation or temporary rehousing at any nearby NSR.

A range of mitigation measures and Best Practicable Means are provided in this report to reduce construction noise and its effects, as far as reasonably practicable.