High Speed Rail (London - West Midlands) Act 2017

High Speed Two (HS2) Ltd

London Borough of Camden

Camden Carriage Sidings Schedule 17 Application

Written Statement in support of the Schedule 17 Application

NR Submission Ref: SRL/ED/42906/CCS $_{V3}$

eB Reference: CENEUS-SKA-APP-EEN-000001

Contents

1. Introduction

1.1 Background Information

This written statement is compiled in accordance with the HS2 Planning Memorandum and Planning Forum Notes 10 and 14 as required by the planning regime established under Schedule 17 of the High Speed Rail (London – West Midlands) Act 2017.This statement provides London Borough of Camden with information to assist with the determination of the bringing into use application. This statement is in support of the bringing into use application for approval.

The High-Speed Rail (London – West Midlands) Act 2017, referred to from this point forward as "the Act", provides powers for the construction and operation of Phase 1 of High Speed Two, including the works which are the subject of this Plans and Specification Schedule 17 submission. HS2 is the nominated undertaker.Section 20 to the Act grants deemed planning permission for the works authorised by it, subject to the conditions set out in Schedule 17. Schedule 17 includes conditions requiring various matters to be approved by the relevant Local Planning Authority (LPA).

This is therefore a different planning regime to that which usually applies in England (i.e. Town and Country Planning Act) and is different in terms of the nature of submissions and the issues that the LPAs can have regard to in determining requests for approval.

Schedule 17 of the Act requires the nominated undertaker (Network Rail) to submit requests for approval to the LPAs for the following:

- Construction arrangements (including large goods vehicle routes)
- Plans and specifications
- Bringing into use requests
- Site restoration schemes

Schedule 17 of the Act also sets out the grounds on which the LPA may impose conditions on approvals, or refuse requests for approval.

This Written Statement includes information supporting the Plans and Specifications Schedule 17 application in relation to the bringing into use of the extended tracks at Camden Carriage Sidings.

Network Rail as the nominated undertaker will be contractually bound to comply with the controls set out in the Environmental Minimum Requirements (EMR). The scope of the EMR encompasses the High Speed Two Code of Construction Practice (CoCP).

1.2 Structure of Written Statement

This submission details the works undertaken by Network Rail (NR) within the Up Sidings section of the Euston approach in the course of enabling works under the Act and provides a context for the Schedule 17 Bringing into use application. It is structured as follows:

- Site location and context for the Schedule 17 application, including plans showing the location of the works and the surrounding environment;
- Policy, requirements and standards;
- Description of works;
- Details of the methodology used in predicting noise and vibration levels;
- Summary and conclusion; and,
- Tables setting out the predicted levels of noise with tabulated results at all HS2 Environmental Statement (ES) assessment locations, highlighting where the Lowest Observed Adverse Effect Level (LOAEL) is likely to be exceeded.

Approval is requested from the qualifying authority for the works detailed and assessed in this submission under paragraph 9 of Schedule 17 of the Act.

The Camden Carriage Sidings are located adjacent to Gloucester Avenue and the Regents Park Road Bridge, London. The site is mainly used for the stabling of rolling stock between the peak hours, with some additional use for overnight rolling stock placement.

Within the Camden Carriage Sidings section of the Euston approach, two existing stabling lines required extending to accommodate trains operated by the Train Operating Companies. The length of the extensions required was approximately 30m. This was to accommodate 12-car Class 350 trains that were previously stabled at Platforms 17 and 18 of Euston station and which have been taken out of use in preparation for HS2 works.

This assessment and submission considers the noise generated through the operation of the extensions to these stabling lines and not potential noise impact through construction works.

This submission has been completed by SRL Technical Services. SRL is a member of the Association of Noise Consultants (ANC) and contributors to this report are members of the Institute of Acoustics (IOA). All work has been completed under the codes of professional conduct required by both professional bodies and within the internal quality assurance scheme operated by SRL.

2. Policy, Requirements and Standards

2.1 High Speed Rail (London – West Midlands) Environmental Minimum Requirements

The High Speed Rail (London – West Midlands) Environmental Minimum Requirements document (EMR) defines and explains the relevant minimum requirements, which are referred to as the 'Environmental Minimum Requirements'.

It also contains, as annexes, a series of papers which support the EMR, including the Code of Construction Practice (CoCP), the Planning Memorandum, the Heritage Memorandum and the Environmental Memorandum.

The controls contained in the EMRs, along with powers contained in the Act and the undertakings given by the Secretary of State, will ensure that impacts which have been assessed in the ES will not be exceeded, unless any new impact or impacts in excess of those assessed in the ES results from a change in circumstances which was not likely at the time of the ES; or would not be likely to be environmentally significant; or results from a change or extension to the project, where that change or extension does not itself require Environmental Impact Assessment (EIA) under either article 4(1) of and paragraph 24 of Annex 1 to the EIA Directive; or article 4(2) of and paragraph 13 of Annex 2 to the EIA directive; or would be considered as part of a separate consent process (and therefore further EIA if required).

2.2 Technical Specifications for Interoperability (TSI)

The European Railway Agency (ERA) has published Technical Specifications for Interoperability (TSI) to create interoperability within the European Union's railway system. The TSI therefore formulates conditions to be met by all rolling stock in the EU.

The current Railways (Interoperability) Regulations 2011, including 2013, 2014 and 2015 amendments regarding noise emissions from conventional rail contains the following noise limits for stationary rolling stock, which takes account intermittent noise from air compressors and HVAC fans (on-train auxiliary plant). This is important because when the trains are operating within the siding extensions, they will be either stationary or moving at such a low speed that noise from the wheel/rail interface and traction equipment will be minimal. The TSI states that the average of the sound pressure level ($L_{PAeq,T}$) taken at equally distributed measurement points at a distance 7.5m from the centre of the track and 1.2m above the top of the rail must not exceed the following values:

- Locomotives 75dB
- Diesel Locomotives 78dB
- **Electric Multiple Units (EMUs) 68dB**
- Diesel Multiple Units (DMUs) 73dB
- Coaches 65dB

The relevant limit value from the list above (highlighted) is what has been used in this assessment. Because it is a limit, the assessment is very much a worst case.

2.3 Information Paper E20 'Control of Noise from Altered Roads and the Operational Railway

The HS2 Phase One Information Paper 'E20: Control of Airborne Noise from Altered Roads and the Operational Railway' document (E20) outlines the measures that will be put in place to control noise during the operation of HS2.

The objective of the policy is to ensure that the nominated undertaker (Network Rail) will take all reasonable steps to design and construct, operate and maintain the operational railway so that the combined airborne noise from these sources, predicted in all reasonably foreseeable circumstances, does not exceed the lowest observed adverse effect levels (LOAEL) set out in Table 1 below.

Where it is not reasonably practicable to achieve this objective, Network Rail will seek to reduce airborne noise from the operational railway as far as is reasonably practicable.

Noise insulation will be offered with the aim that airborne noise from the operational railway does not give rise to significant adverse effects on health and quality of life that would otherwise be expected when airborne noise exceeds the significant observed adverse effect levels (SOAEL) set out in Table 1 below.

Where possible, the nominated undertaker (Network Rail) will also contribute to the improvement of health and quality of life through the control of airborne noise. Table 1 from E20 is presented below as Table 1.

Table 1 – Operational Noise Effect Levels for Permanent Residential Buildings

Time of day	Lowest Observed Adverse Effect Level (dB)	Significant Observed Adverse Effect Level (dB)
Day (0700 – 2300)	50 LpAeq, 16hr	65 LpAeq, 16hr
Night (2300 – 0700)	40 LpAeq, 8hr	55 LpAeq, 8hr
	60 LpAFMax (at the façade, from any nightly noise event)	80 LpAFMax (at the façade, from more than 20 nightly train passbys), or 85 LpAFMax (at the façade, from 20 or fewer nightly train passbys)

2.4 Information Paper E21 'Control of Ground-Bourne Noise and Vibration from The Operation of Temporary and Permanent Railways'

The HS2 Phase One Information Paper 'E21: Control of Ground-Bourne Noise and Vibration from The Operation of Temporary and Permanent Railways' document (E21) outlines the measures that will be put in place to control ground-borne noise and vibration from the operation of HS2 Phase One temporary and permanent railways.

The nominated undertaker (Network Rail) will design the temporary and permanent railways such that the level of ground-borne noise and vibration predicted in all reasonably foreseeable circumstances does not exceed the SOAELs given in Table 2 below.

In the context of this written statement, the nominated undertaker (Network Rail) will take all reasonably practicable steps to construct, operate and maintain the temporary and permanent railways so that the design objective stated above is fulfilled.

In addition, the nominated undertaker (Network Rail) will take all reasonable steps to design, construct, operate and maintain the temporary and permanent railways such that, in all reasonably foreseeable circumstances, ground-borne noise and vibration does not exceed the LOAELs given in Table 2 below.

The policy goes on to state that Network Rail in this case will reduce ground-borne noise and vibration from the temporary and permanent railways as far as is reasonably practicable.

To control ground-borne noise and vibration from the temporary and permanent railways, the nominated undertaker (Network Rail) will be required to do the following in relation to the track systems:

- at design stage, predict, through the use of appropriate modelling, the engineering requirements of the track system that will fulfil the objectives;
- design a standard track form with the objective of meeting as many of those engineering requirements identified in the previous bullet as can reasonably be achieved by such a standard track system;
- design an enhanced track form for locations where it is predicted that the standard track system will not meet the engineering requirements or to discharge other project commitments and undertakings;
- translate the engineering requirements into contract specifications for the track systems; and
- procure, install and maintain the track systems to meet the contract specifications established above.

To ensure that the measures to control ground-borne noise and vibration are reasonable, the nominated undertaker will take account of the set of shared UK principles that underpin the Government's sustainable development strategy.

An indoor sound level of 35 dB L_{pASMax}, in any habitable room, is considered the LOAEL for ground-borne noise. A low level of annoyance would be expected at ground-borne noise levels at or below 35 dB L_{pASMax}.

Vibration (indoors, near the centre of any dwelling room on the ground floor) of 0.2 VDV $m/s^{1.75}$ daytime (0700 - 2300) and/or 0.1 VDV $m/s^{1.75}$ night time (2300 – 0700) are considered the LOAELs for ground-borne vibration.

At these values, the relevant British Standard on human exposure to vibration in buildings suggest a low probability of adverse comment.

An indoor sound level of 45 dB L_{pASMax}, in any habitable room, is considered the SOAEL for ground-borne noise. A significant number of people would be expected to be seriously annoyed at or above ground-borne noise levels of 45 dB $L_{pASMax.}$

Vibration (indoors, near the centre of any dwelling room on the ground floor) of 0.8 VDV $m/s^{1.75}$ daytime (0700 - 2300) and/or 0.4 VDV $m/s^{1.75}$ night time (2300 – 0700) are considered the SOAELs for ground-borne vibration.

At these levels, relevant British Standard on human exposure to vibration in buildings suggest that adverse comment is probable. Table 1 from E21 is presented below as Table 2.

Table 2 - Ground-borne noise and vibration effect levels for permanent residential buildings

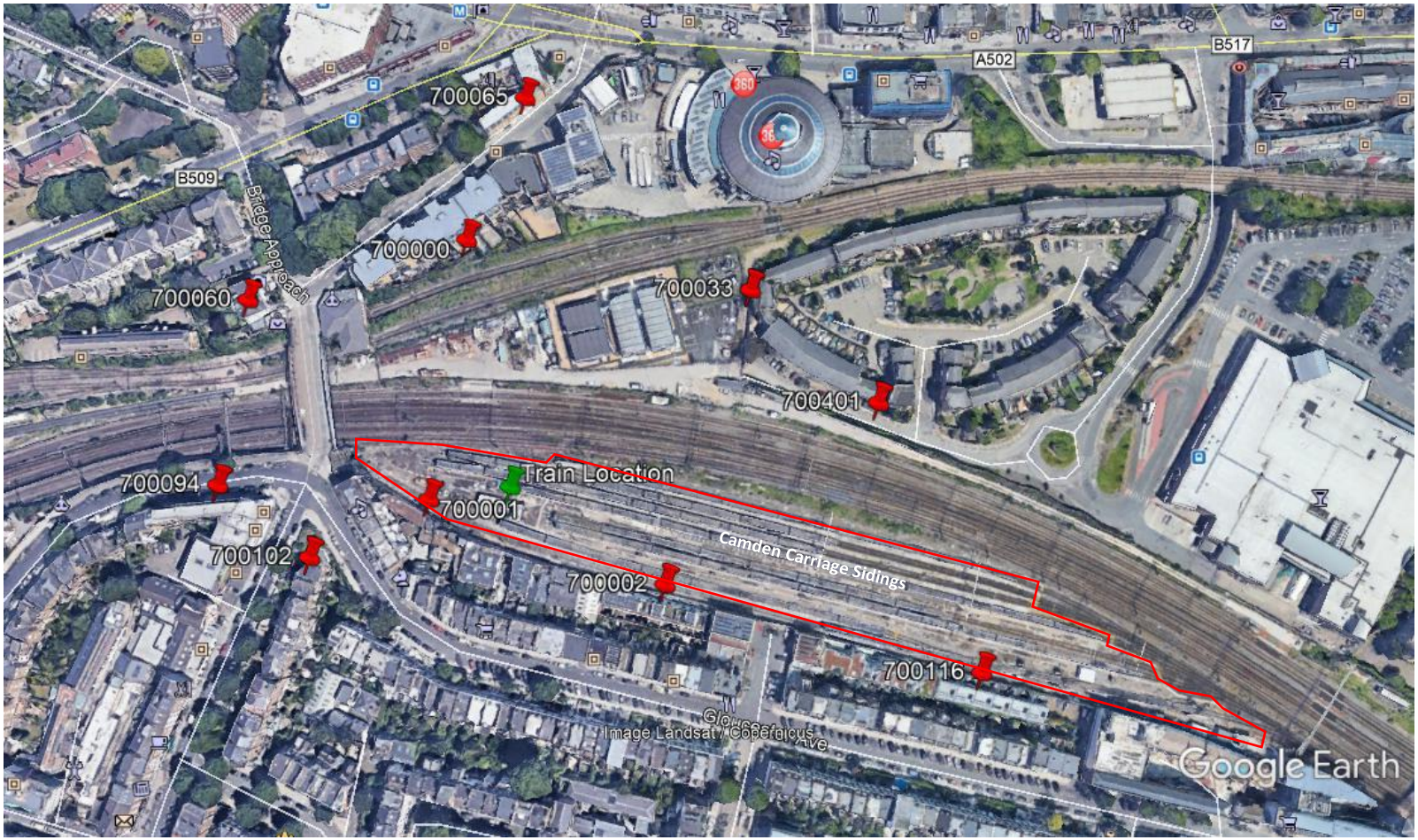
Ground-borne noise	Lowest Observed Adverse Effect Level	L_{pASMax} [dB]		35
	Significant Observed Adverse Effect Level	L_{pASMax} [dB]		45
Vibration	Lowest Observed Adverse Effect Level	VDVday[$m/s^{1.75}$]		0.2
		VDVnight[$m/s^{1.75}$]		0.1
	Significant Observed Adverse Effect Level	VDVday[$m/s^{1.75}$]		0.8
		VDVnight[$m/s^{1.75}$]		0.4

3. Description of works

Within the Camden Carriage Sidings section of the Euston approach, two existing stabling lines required extending to accommodate trains operated by the Train Operating Companies. The length of the extensions required was approximately 30m. This was to accommodate 12-car Class 350 trains that were previously stabled at Platforms 17 and 18 of Euston station which have been taken out of use in preparation for HS2 works.

In order for these sites to accommodate these trains small sections of track had to be extended. The works required for these extensions involved the demolition of a small redundant masonry building, including removal of the concrete floor slab, within the Camden Carriage Sidings to allow two of the lines to then be extended. Associated modifications to OLE (Overhead Line Equipment) gantries and buffer stops were also completed.

Figure 1 - Site Plan



4. Methodology

For the purpose of this application, the final use of the two extended sidings is being considered, therefore identifying the typical parking modes of the rolling stock must be clarified. It is generally considered that stock using the extensions will be Electric Multiple Units (EMUs) that will enter the site and will then be manually placed into 'sleeping mode', which requires that at least one pantograph is raised.

Sleeping mode includes ventilation and heating and cooling (HVAC) to be found on almost all modern EMUs (Electric multiple units), DMUs (Diesel multiple units), locomotives and passenger cars; often located on the roof with auxiliary plant underslung under the train, retaining temperatures within a manageable range for later preparation service (i.e. 10 to 28 °C), reducing fan speeds to a minimum of requirements.

Train movements on the short, extended, sections of track detailed in this application have been reviewed and assessed for potential ground-borne vibration impact to properties outside of the extended site area. Given the very low speed of the trains when travelling in to or out of the siding extensions, no significant vibration will be generated at the wheel/rail interface. Furthermore, any plant mounted on the train that may operate whilst the train is stationary will be suitably isolated by the train design so as not to transmit vibration into the train body (this would be structurally undesirable and disturbing to passengers) which could propagate to the track via the suspension and wheels. Therefore, vibration and ground-borne noise have been screened out of this assessment and will not be considered further within this application.

The table below details the noise source data used, including the level, the number of sources (trains), and the on-time assumed for the auxiliary plant, which is given as a percentage of activity over an 8-hour night.

The assumption is that the plant will only be in operation for a short period of approximately 1 hour over the 8 hours hence the 12.5% is the worst case scenario.

Table 3 – Noise source data

Train type	Railways (Interoperability) Regulations 2011, including 2013, 2014 and 2015 amendments reference Description	No. of trains	LPA [dB(A)] at 7.5m	Percentage on time
Class 350 EMU	EMUs	2	68	12.5%

5. Noise Predictions.

Noise levels due to operation of the siding extensions, at sensitive receptors identified in the ES, have been predicted using industry standard 3D acoustic modelling software – DataKustik CadnaA.

When determining the 'on time' for auxiliary plant on stationary trains in the siding extensions, we have considered the worst case operating time over a night time period (8 hours), to enable direct comparison with the night time LOAEL values given in E20 (reproduced in Table 1 of this document). The predicted noise levels generated by the model are therefore dB $L_{Aeq\ 8\text{-}hour}$ values.

Since the extensions are the section of track immediately adjoining the buffer stops, the speed of trains within them will be very low. This means that noise from the wheel/rail interface, vibration, and noise from traction equipment and general operational noise will be minimal. The predominant noise source will be from auxiliary plant.

The results are shown on the following page. The results presented are at a height of 1.5m above local ground level, also the height of a typical upper floor level that represents the majority of receptors. Noise levels at all the receptors detailed on the site plan are summarised in Table 5.

6. Summary

As can be seen from Table 5 below, the highest predicted noise levels at each of the sensitive receptors identified in the ES, due to the operation of the siding extensions are no higher than the LOAEL value (from E20, LOAEL is 40 LpAeq, 8hr at night).

The upper floors of receptors are more exposed due to the reduced amount of shielding from the sides of the cutting.

Table 5: Highest predicted operational noise levels

Assessment Location ID	Receptor address	Highest predicted noise level (dB $L_{Aeq\ 8\text{-}hour}$) [ground floor]	Highest predicted noise level (dB $L_{Aeq\ 8\text{-}hour}$) [upper floor]
700002	Dumpton Place	21	35
700001	Gloucester Avenue	21	32
700094	King Henrys Road	11	10
700060	Bridge Approach	11	11
700000	Regents Park Road	17	32
7000102	Regents Park Road	13	12
700033	Juniper Crescent	8	22
700401	Juniper Crescent	15	27
700116	Sunny Mews,	10	22

The noise model for the scheme was prepared using DataKustik CadnaA, which has been extensively used for noise predictions of HS2 enabling works around the Euston throat. For predictions of noise from discrete sources, the methodology described in ISO 9613 is utilised and previous validation exercises have found it to be accurate in similar circumstances to within ±3dB.

As a worst-case scenario, we have used the upper limit value for source noise level from the 'Railways (Interoperability) Regulations 2011, including 2013, 2014 and 2015 amendments' but the actual source noise level is likely to be lower than this, possibly significantly so. The biggest uncertainty is the auxiliary plant on-time over the assessment period of 8 hours, with 1 hour being assumed. However, even if the on-time was double this, the resultant 8-hour noise level would increase by only 3dB.

Taking all these uncertainties into consideration, it is highly unlikely that the highest noise levels at the receptors will be more than 3dB higher than those given in Table 5 and they may be significantly lower. Given that the highest predicted noise level in Table 5 is 5dB below the LOAEL value, the risk of the LOAEL value actually being exceeded due to uncertainties in the prediction method is therefore very small.

As previously stated, the fact that trains operating within the siding extensions will either be stationary or moving at a very low speed means that vibration is not a factor that needs to be considered in terms of impact on the sensitive receptors.

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7.Conclusion

The extension of two tracks within Camden Carriage Sidings by approximately 30m will each accommodate a maximum of one carriage of Electrical Multiple Unit trains.

Since the extensions are the section of track immediately adjoining the buffer stops, the speed of trains within them will be very low. This means that noise from the wheel/rail interface, vibration, and noise from traction equipment will be minimal. The predominant noise source will be from auxiliary plant on stationary EMUs in 'sleeping mode'.

Noise levels at nearby sensitive receptors identified in the ES have been predicted and compared to the night time (lowest) LOAEL value given in E20.

The LOAEL value is not exceeded at any receptor. Therefore, incorporating specific mitigation within the design of the siding extensions to control operational noise is not required.

8. Appendix 1

Figure 3 - Noise levels at 1.5m height from two trains using the siding extensions (dB $L_{Aeq\ 8\text{-}hour}$)

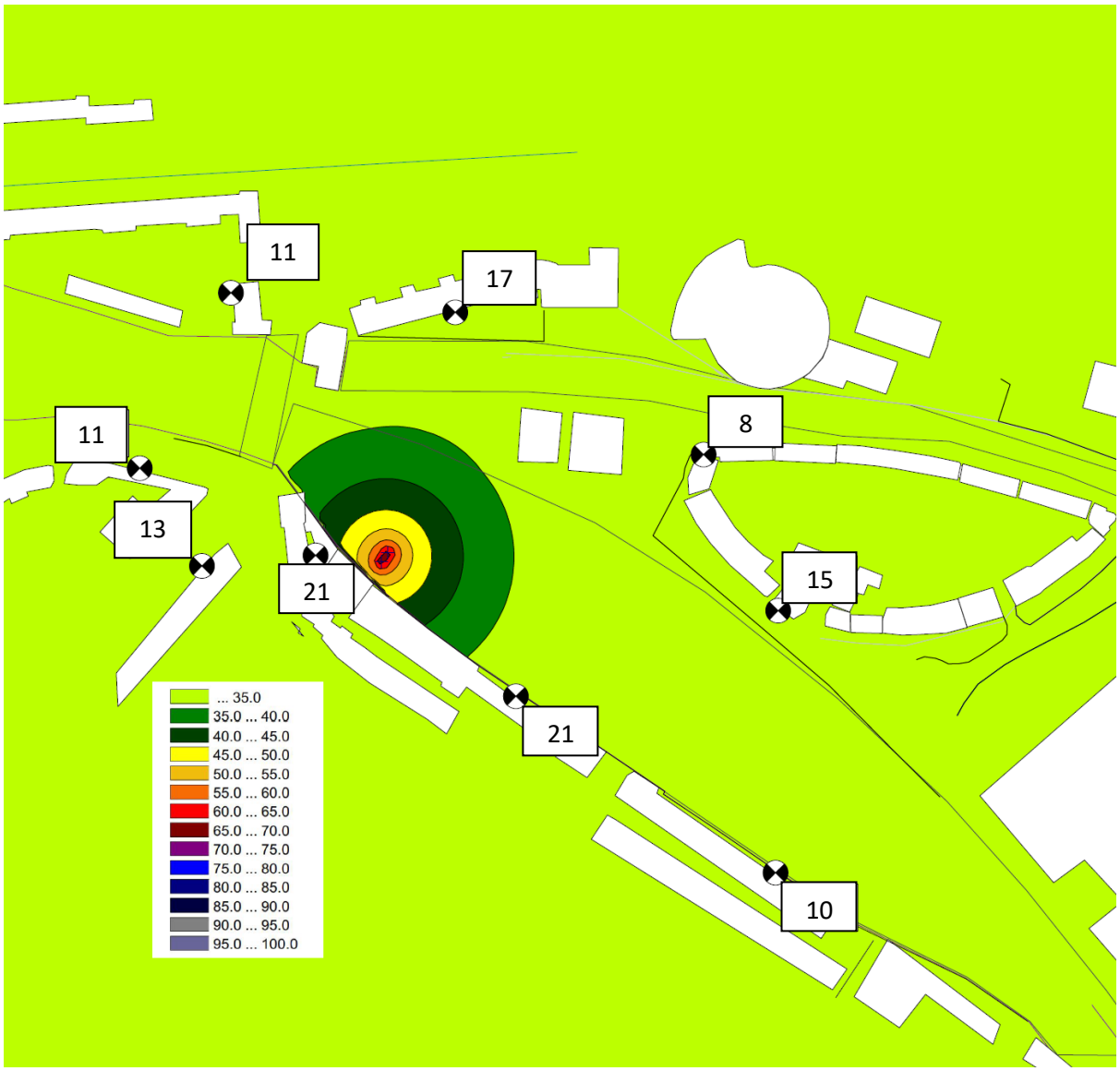

Figure 4 - Noise levels at 9m height from two trains using the siding extensions (dB $L_{Aeq\ 8\text{-}hour}$)