



Construction Noise Criteria

In order to assess the effects of construction noise and vibration, it is necessary to establish standards below which the impact is considered to be acceptable. Hence, if an assessment indicates that the standards are likely to be exceeded, alternative construction methods would need to be considered or specific means of mitigation adopted. Proposed construction noise criteria are set out in the table below.

Proposed construction noise limits for the site set at the minimum noise levels recommended within BS5228-1:2009 "Code of practice for noise and vibration control on construction and open sites" are provided in the table below:

Total Noise Levels at Designated Noise Sensitive Locations			
Period	Hours	Ambient Construction Noise Level $L_{Aeq,T}$, dB(A)	Period T over which Ambient $L_{Aeq,T}$ is applicable, hours
Mondays to Fridays	0800-1800	65	any 4 hours
Mondays to Fridays (if permitted)	1800-2200	55	any 1 hour
Saturdays (if permitted)	0800-1300	65	any 4 hours
	1300-1800	55	any 1 hour
	1800-2200	55	
Sundays (if permitted)	0800-0900	55	any 1 hour
	0900-1700	55	
	1700-2200	55	
Any day (if permitted)	2200-0800	Construction Noise Levels subject to negotiation with EHO	

T1 Construction Noise limits

(i) Construction noise levels in the schedule relate to free-field conditions, where designated noise sensitive locations are located more than 3.5m from building façades or other reflective surfaces other than the ground. Where noise designated noise sensitive locations are located within 1.0m from building façades, the permitted noise levels can be increased by 3 dB(A).



(ii) The ambient noise level, $L_{Aeq,T}$ at a designated noise sensitive location is the total L_{Aeq} from all the noise sources in the vicinity over the specified period.

(iii) The existing ambient noise level, $L_{Aeq,T}$ at a designated noise sensitive location is the total L_{Aeq} from all the noise sources in the vicinity over the specified period prior to the commencement of the Works.

Vibration Criteria

With regard to standards for vibration during construction, these have been developed with reference to the documents and recommended values set out below.

Document	Onset of Effect of Vibration on People	Onset of Potential Cosmetic Damage to Buildings
BS 5228:1992:Part 4 ⁽ⁱ⁾	0.15 – 0.30 mms^{-1} PPV	10.0 mms^{-1} PPV
DIN 4150:1986:Part 3 ⁽ⁱⁱ⁾	0.2 mms^{-1} PPV	5.0 – 20.0 mms^{-1} PPV
BS 6472:2008 ⁽ⁱⁱⁱ⁾	0.2 $\text{ms}^{-1.75}$ VDV_{day} 0.1 $\text{ms}^{-1.75}$ $\text{VDV}_{\text{night}}$	N/A

T2 Vibration criteria

It is worth noting that the 0.2 mms^{-1} PPV (Peak Particle Velocity) referred to in DIN 4150 and BS 6472 is around the human threshold of perception of vibration, although there is some variation between individuals.

Taking all these factors together, we propose that all construction processes that are likely to generate a vibration level in excess of 1.0 mms^{-1} PPV at any location within any nearby sensitive building, are subject to a more detailed assessment to determine whether mitigation measures are appropriate. That assessment should be undertaken with a view to establishing not only the levels of vibration likely to be generated but also the duration and frequency of their occurrence so that Vibration Dose Values (VDVs) can be calculated and compared to the relevant standards. If these are also exceeded, then mitigation measures or alternative means of carrying out particular activities will need to be investigated.

We are not aware of any buildings near the site that are classified as Historic. However this should be verified in order that an appropriate assessment can be made in the event of the above suggested 1.0 mms^{-1} PPV being exceeded.



Section 61 Agreements and Code of Construction Practice

The Environmental Protection Act 1990 gives Local Authorities powers to control noise from construction sites by reference to Sections 60 and 61 of the Control of Pollution Act 1974 (COPA). Section 61 facilitates a process by which a Contractor agrees a method of working with a Local Authority, often stipulating hours and methods of working and occasionally agreeing specific noise limits at sensitive locations. The advantage of such an agreement is that compliance with it protects the Contractor from being served with a notice to cease works on account of the noise and vibration impact. The Local Authority has the power under Section 60 of COPA to serve such a notice if it deems the construction noise to be causing a nuisance.

As a means of minimizing the risk of noise disturbance and disruption, the Developer may make it a contractual obligation for the Contractor(s) to establish Section 61 Agreements (or similar) with the Local Planning Authority for the works to be carried out. The content of those agreements cannot as yet be defined in detail, but the following areas might be discussed and included.

- Hours of working: limited to those times when the sensitivity of affected parties nearby is not so acute.
- Methods and types of plant: particular construction or demolition methods may be disallowed on the site due to the severity of the noise typically generated, as may certain types of plant.
- Low noise plant and noise mitigation: directives on the selection of low noise plant where practical may be included as well as specific types of mitigation for equipment or processes which lend themselves to the same.
- Noise limits: occasionally and under specific circumstances it may be appropriate to set noise limits for certain periods and at certain locations.
- Monitoring, liaison and reporting: the agreement may specify that noise and vibration monitoring is required at certain locations for record keeping and evaluation purposes. Particular parties responsible for liaison and reporting to the local planning authority and other nominated parties may also be identified.

Section 61 Agreements can be a valuable tool which will enable the local authority to control the noise impact from construction activity while giving the Contractor an agreed framework within which the operations can be carried out. This minimises the risk of disruption to operations without leading to unacceptable consequences for noise sensitive parties. In order to demonstrate the method of control that would be imposed by the Employer on any Contractor undertaking construction works on the site, the next Appendix contains an example for a Code of Construction Practice dealing with noise and vibration generation.



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- ⁱ British Standard 5228: 1992: Noise control on construction and open sites: Part 4.
 - ⁱⁱ Deutsche Norm 4150: 1992: Erschütterungen im Bauwesen – Einwirkungen auf Menschen in Gebäuden.
 - ⁱⁱⁱ British Standard 6472: 2008: Evaluation of human exposure to vibration in buildings (1Hz to 80Hz).



Example Code of Construction Practice

Prior to commencement of works, the Contractor is to seek the Local Authority's formal consent via a Section 61 application (Control of Noise and Pollution Act 1974) or similar framework for the proposed methods of work and the steps to be taken in order to minimise noise and vibration.

It is anticipated that the Local Authority requirements would be similar to the requirements set out within this Appendix. Compliance with the requirements in this appendix should however in no way compromise full compliance with any other requirements agreed with the Local Authority.

The normal working hours within the site shall be Mondays to Fridays between 0800 and 1800 hours and Saturdays between 0800 and 1300 hours, with no working on Sundays or Public Holidays. Exceptionally, consent for work outside these hours may be given after any necessary consultation, particularly with the Environmental Health Officer (EHO). Fourteen days' notice should normally be required from the Contractor when seeking such consent.

The noise levels scheduled below for periods outside normal working hours shall only be permitted when consent has been given to exceptional working.

Ambient Noise Levels

The ambient noise level, $L_{Aeq,T}$ from all sources when measured 1.5m above the ground at any noise sensitive receiver position shall either not exceed the appropriate level given in the agreed Schedule or not exceed by more than 3dB(A) the existing ambient noise level, $L_{Aeq,T}$ at the receiver location measured over the same period, whichever is the greater.

If ambient noise levels are above or close to the limits set out in the schedule, it may be appropriate to carry out noise monitoring at or near the noise sensitive receiver locations prior to commencement of the works. The updated data should be made available to the Contractor. It should act as the baseline existing ambient noise level data with which compliance with the requirements set out is to be tested. The data should either be measured at or be corrected to be representative of the pre-existing noise levels at the noise sensitive positions and provided in terms of hourly L_{A90} , L_{Aeq} and $L_{Amax,S}$ noise indices.

Exceptionally, the Contractor may be given permission to carry out works which exceed the noise levels in the Schedule, provided that 14 days notice of the date and timing of the work is given and the Contractor demonstrates that he has taken all reasonable measures to mitigate the noise nuisance. After consultation with the Local Authority and any other interested bodies a decision would normally be given within 7 days of receipt of the notice.

If the need arises to measure noise levels at a location other than one of the designated noise sensitive locations, the permitted noise level shall be related to the nearest designated noise sensitive location. The permitted noise levels at another location shall take into account the



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difference in distance, topography and screening between the noise source and the nearest designated noise sensitive location and the noise source and the measuring location.

Proposed construction noise criteria are set out in the table below.

Total Noise Levels at Designated Noise Sensitive Locations			
Period	Hours	Ambient Construction Noise Level $L_{Aeq,T}$, dB(A)	Period T over which Ambient $L_{Aeq,T}$ is applicable, hours
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Mondays to Fridays (if permitted)	1800-2200	55	any 1 hour
Saturdays (if permitted)	0800-1300	65	any 4 hours
	1300-1800	55	any 1 hour
	1800-2200	55	
Sundays (if permitted)	0800-0900	55	any 1 hour
	0900-1700	55	
	1700-2200	55	
Any day (if permitted)	2200-0800	Construction Noise Levels subject to negotiation with EHO	

T1 Construction Noise limits

(i) Construction noise levels in the schedule relate to free-field conditions, where designated noise sensitive locations are located more than 3.5m from building façades or other reflective surfaces other than the ground. Where noise designated noise sensitive locations are located within 1.0m from building façades, the permitted noise levels can be increased by 3 dB(A).

(ii) The ambient noise level, $L_{Aeq,T}$ at a designated noise sensitive location is the total L_{Aeq} from all the noise sources in the vicinity over the specified period.

(iii) The existing ambient noise level, $L_{Aeq,T}$ at a designated noise sensitive location is the total L_{Aeq} from all the noise sources in the vicinity over the specified period prior to the commencement of the Works.

The Contractor shall employ the best practical means to minimise the noise and vibration produced by his operations and shall have regard to the recommendations in BS5228:2009 "Code of practice for noise and vibration control on construction and open sites".



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Without prejudice to the generality of the Contractor's obligations set out above the Contractor shall comply in particular with the following requirements:-

- All vehicles and mechanical plant used for the purpose of carrying out the works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order so that extraneous noises shall be reduced to a minimum.
- All compressors and generators shall be "sound reduced" models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use. All ancillary pneumatic percussion tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers. Generators shall be positioned and enclosed so as to minimise noise transmission to the inhabitants in the neighbourhood as agreed with the Employers Agent.
- All pumps shall be positioned and enclosed so as to minimise noise transmission to inhabitants in the neighbourhood.
- All machines in intermittent use shall be shut down in the intervening periods between work or, where this is impracticable, throttled down to a minimum.
- No machine shall be permitted which uses a system of dropping a heavy weight, power assisted or by gravity, for the purpose of breaking up paving or foundations.
- Access to the Site shall be such as to ensure a minimum of disturbance to persons in adjacent buildings by vehicles or plant entering or leaving the Site. No deliveries to Site shall take place outside the agreed working hours.
- Any work agreed to be carried out between 2200 and 0800 hours will be subject to agreement to noise levels with Environmental Health Officer. The Contractor shall provide details on work involved, machinery or plant used, exact location, and calculated noise levels at monitoring points.

Any fixed or static plant operating outside normally permitted working hours shall be assessed against the existing free-field background L_{A90} noise levels at noise control stations, in accordance with BS4142:2014 "Methods for rating and assessing industrial and commercial sound". The existing baseline free-field background noise levels are to be provided as explained earlier.

Without prejudice to the foregoing and to requirements of particular clauses in the Conditions of Contract, the Contractor shall not be permitted to carry out works as stated below, except where such work is absolutely necessary for the saving of life or property and the safety of the Works or as is required under the terms of the Contract.

Piling, including sheet piling, by percussive methods outside the hours of 0800 to 1800 Mondays to Fridays.



The maintenance of mechanical or other constructional plant in the proximity of noise sensitive buildings outside the hours of 0800 to 1800 on Mondays to Saturdays or at any time on Sundays and public holidays.

All construction operations shall be such that they do not exceed a peak particle velocity vibration level of 5 mm/s at any nearby sensitive location as well as the VDV's set out in the table below in the relevant areas.

Construction Vibration Dose Value Criteria

Areas	VDV 07:00h to 23:00h	VDV 23:00h to 07:00h
Residences	0.20	0.10
Commercial Buildings	0.20	0.40

T2 VDV Criteria

Figure 14/0299/RL01

Title:

Local Road Link Diagram

 Road Link



Project:

East Woodstock

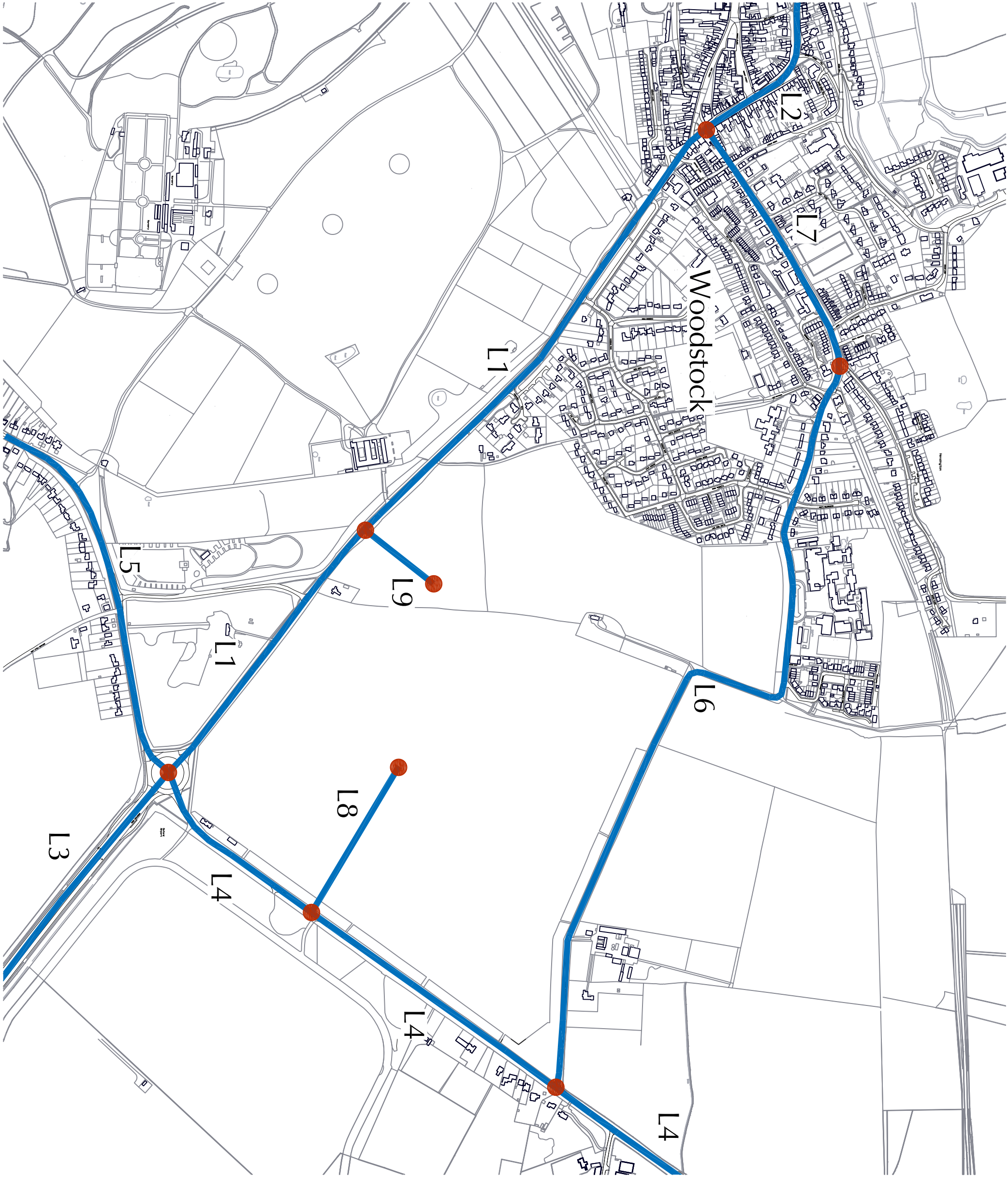
Date:

Revision:

November 2014

Scale:

Not to scale





Schedule – Road Network Noise Assessment Appendix RT

Scenario 1 (DM33) vs Scenario 2 (DS33) Short Term Effect

Link Ref	Description	18-hour traffic flow		Change in Noise Level, dB $L_{A10, 18 \text{ hour}}$	Short Term Effect
		DM33	DS33		
L1	A44 Oxford Road	21,601	22,556	+0.2	Negligible
L2	A44 Manor Road	16,672	16,722	+0.1	Negligible
L3	A44 Woodstock Road	32,728	33,142	+0.2	Negligible
L4	A4095 Upper Campsfield Road	13,533	14,195	+0.3	Negligible
L5	A4095 Grove Road	21,629	22,184	+0.1	Negligible
L6	Shipton Road	2,399	2,958	+0.6	Negligible
L7	Hensington Road	3,851	4,410	+0.4	Negligible



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Scenario 1 (DM33) vs Scenario 5 (DS48) Long Term Effect

Link Ref	Description	18-hour traffic flow		Change in Noise Level, dB $L_{A10, 18 \text{ hour}}$	Long Term Effect
		DM33	DS48		
L1	A44 Oxford Road	21,601	27,841	+1.2	Negligible
L2	A44 Manor Road	16,672	21,488	+1.2	Negligible
L3	A44 Woodstock Road	32,728	42,183	+1.2	Negligible
L4	A4095 Upper Campsfield Road	13,533	17,443	+1.4	Negligible
L5	A4095 Grove Road	21,629	27,878	+1.2	Negligible
L6	Shipton Road	2,399	3,092	+1.6	Negligible
L7	Hensington Road	3,851	4,964	+1.4	Negligible



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Scenario 4 (DM48) vs Scenario 5 (DS48) Long Term Effect

Link Ref	Description	18-hour traffic flow		Change in Noise Level, dB $L_{A10, 18 \text{ hour}}$	Long Term Effect
		DM48	DS48		
L1	A44 Oxford Road	27,841	28,796	+0.1	Negligible
L2	A44 Manor Road	21,488	21,538	+0.1	Negligible
L3	A44 Woodstock Road	42,183	42,597	+0.1	Negligible
L4	A4095 Upper Campsfield Road	17,443	18,105	+0.3	Negligible
L5	A4095 Grove Road	27,878	28,433	+0.1	Negligible
L6	Shipton Road	3,092	3,651	+0.5	Negligible
L7	Hensington Road	4,964	5,523	+0.3	Negligible



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Scenario 1 (DM33) vs Scenario 4 (DM48) Long Term Effect

Link Ref	Description	18-hour traffic flow		Change in Noise Level, dB $L_{A10, 18 \text{ hour}}$	Long Term Effect
		DM33	DM48		
L1	A44 Oxford Road	21,601	27,841	+1.2	Negligible
L2	A44 Manor Road	16,672	21,488	+1.2	Negligible
L3	A44 Woodstock Road	32,728	42,183	+1.2	Negligible
L4	A4095 Upper Campsfield Road	13,533	17,443	+1.2	Negligible
L5	A4095 Grove Road	21,629	27,878	+1.2	Negligible
L6	Shipton Road	2,399	3,092	+1.2	Negligible
L7	Hensington Road	3,851	4,964	+1.2	Negligible



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Scenario 2 (DM33+) vs Scenario 3 (DS33+) Short Term Effect

Link Ref	Description	18-hour traffic flow		Change in Noise Level, dB $L_{A10, 18 \text{ hour}}$	Long Term Effect
		DM33+	DS33+		
L1	A44 Oxford Road	22,931	23,886	+0.2	Negligible
L2	A44 Manor Road	18,002	18,052	+0.1	Negligible
L3	A44 Woodstock Road	36,053	36,467	+0.1	Negligible
L4	A4095 Upper Campsfield Road	14,464	15,126	+0.3	Negligible
L5	A4095 Grove Road	22,693	23,248	+0.1	Negligible
L6	Shipton Road	2,399	2,958	+0.6	Negligible
L7	Hensington Road	3,851	4,410	+0.4	Negligible



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Scenario 2 (DM33+) vs Scenario 6 (DS48+) Long Term Effect

Link Ref	Description	18-hour traffic flow		Change in Noise Level, dB $L_{A10, 18 \text{ hour}}$	Long Term Effect
		DM33+	DS48+		
L1	A44 Oxford Road	22,931	29,171	+1.2	Negligible
L2	A44 Manor Road	18,002	22,818	+1.1	Negligible
L3	A44 Woodstock Road	36,053	45,508	+1.2	Negligible
L4	A4095 Upper Campsfield Road	14,464	18,374	+1.3	Negligible
L5	A4095 Grove Road	22,693	28,942	+1.2	Negligible
L6	Shipton Road	2,399	3,092	+1.6	Negligible
L7	Hensington Road	3,851	4,964	+1.4	Negligible



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Scenario 6 (DM48+) vs Scenario 6 (DS48+) Long Term Effect

Link Ref	Description	18-hour traffic flow		Change in Noise Level, dB $L_{A10, 18 \text{ hour}}$	Long Term Effect
		DM48+	DS48+		
L1	A44 Oxford Road	29,171	30,126	+0.1	Negligible
L2	A44 Manor Road	22,818	22,868	+0.1	Negligible
L3	A44 Woodstock Road	45,508	45,922	+0.1	Negligible
L4	A4095 Upper Campsfield Road	18,374	19,036	+0.3	Negligible
L5	A4095 Grove Road	28,942	29,497	+0.1	Negligible
L6	Shipton Road	3,092	3,651	+0.5	Negligible
L7	Hensington Road	4,964	5,523	+0.3	Negligible