

**THE PLANNING ACT 2008**

**M4 (JUNCTIONS 3 TO 12) (SMART MOTORWAY) DEVELOPMENT CONSENT  
ORDER APPLICATION**

**TR010019**

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**Issue Specific Hearing - Environment - Noise**

**Appendix A - Note on varying noise reduction based  
on barrier height**

**Deadline VII - 17 February 2016**

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## M4 J3 TO J12 SMART MOTORWAY

17<sup>th</sup> February 2016

### NOTE ON THE EFFECTS OF INCREASED BARRIER HEIGHT TO LOWER EARLEY AND COSTS OF INCREASED BARRIER PROVISION

#### 1.0 Introduction

1.1 At the Issue Specific Hearing into Environmental Issues on 10 - 12 February 2016, the Examining Authority asked that a note be submitted providing further information on two areas:

1.1.1 The differences in noise reductions between the provision of a 2.5 metre high barrier, as proposed in the Enhanced Noise Mitigation Study (“ENMS”), and the provision of a 3.5 metre high barrier to Lower Earley, as requested by interested parties; and

1.1.2 The cost of extending the barriers to fill-in gaps in the barriers at Lower Earley, Hatch Farm Dairies and Emmbrook.

1.2 This note provides the above requested information in sections 2 and 3 respectively.

#### 2.0 Increase in Height of Barrier at Lower Earley

##### 2.1 Results and recommendation from Enhanced Noise Mitigation Study

2.1.1 Lower Earley was included in the ENMS as area EM8. All areas, EM1 to EM34, were treated in exactly the same manner in the assessment of noise decreases and monetized benefits. The analysis for EM8 is provided in Appendix C of the ENMS report.

2.1.2 For Lower Earley, a 2.5m barrier has been specified as it meets the requirement for a noise decrease of at least 3 decibels (dB). However, it does not qualify for any further increase in barrier height, as it does not meet the requirement that the barrier result in a further decrease of 1dB for each subsequent increase in height of 0.5m.

##### 2.2 Comparison of noise decreases for 2.5 metre high barrier and 3.5 metre high barrier

2.2.1 Table 1 shows the calculated noise decreases for the provision of a 2.5 metre high barrier (scenario Z1) and a 3.5 metre high barrier (scenario Z3). Scenario Z0 is the baseline scenario with no noise barrier.

**Table 1: Comparison of Noise Decreases for Scenarios Z1 and Z3 (relative to Scenario Z0)**

Range (dB)	Significance	Number of Properties	
		Z1 minus Z0 Noise Decreases (2.5m barrier)	Z3 minus Z0 Noise Decreases (3.5m barrier)
1 <= L < 3	Minor	711	972

3 <= L <5	Moderate	68	196
>=5	Major	0	0

Note L is the noise level change

2.2.2 Whilst there is a substantial increase in the numbers of properties predicted to experience Minor or Moderate noise decreases with the provision of a 3.5 metre high barrier compared to a 2.5 metre high barrier, the changes in noise decreases are quite small. This is illustrated in Table 2, which shows that the provision of a 3.5 metre high barrier instead of a 2.5 metre high barrier will only result in low end Minor noise decreases between 1 and 1.4 dB at 150 properties and negligible noise decreases at the remainder.

**Table 2: Noise Decreases for Scenario Z1 to Scenario Z3**

Range (dB)	Significance	Number of Properties
		Z3 minus Z1 Noise Decreases
1 <= L < 1.4	Low End Minor	150
< 1	Negligible	Remainder

### 2.3 Comparison of cost increase for the provision of a 3.5 metre high barrier compared to a 3.5 metre high barrier

2.3.1 The barrier cost for a 2.5 metre high barrier is £1,011,976 and the barrier cost for a 3.5 metre high barrier is £1,471,192, resulting in an increased cost of £459,216 for the provision of a 3.5 metre high barrier.

### 2.4 Conclusions

2.4.1 The provision of a 2.5m barrier at Lower Early is based on the application of the three part process detailed in the ENMS that has been applied consistently across the Scheme. Highways England maintains that the results above indicate that the correct barrier height has been selected for implementation as part of the ENMS.

### 3.0 Costs of Barrier Extensions

#### 3.1 General Cost Data

3.1.1 Estimated noise barrier 60 year life costs are included in Appendix B of the ENMS, repeated below as Table 3.

**Table 3: Noise barrier 60 years costs used in assessment**

BARRIER HEIGHT (METRES)	COST / METRE
2	£422
2.5	£476
3	£530
3.5	£692

4	£853
4.5	£1,014
5	£1,175

### 3.2 Estimated Costs at Specific Locations

3.2.1 Table 4 below shows estimated costs at three locations using Highways England's 60 year life costs for 2.5 and 3.5m high barriers. Whilst the requested costs have been provided, as the existing properties in these locations are generally in excess of 300m from the M4, the provision of barriers is anticipated to have a negligible effect on the noise levels at existing properties and, as such, represent poor use of public funds. Should private developers (such as at Hatch Farm Dairies) require noise mitigation, over and above the improvements in noise climate due to the provision of the Scheme, it is for those developers to provide and fund these improvements.

**Table 4: Estimated costs of barrier extensions**

Description	Length (m)	Height (m)	Estimated Cost (£)
Sheet 4 and 5 of Drawing 2:  Provision of new barrier between Lower Early and Mill Lane (eastbound carriageway, chainage 50560 to 49150)	1410	2.5	671,160
Sheet 4 and 5 of Drawing 2:  Provision of new barrier between Lower Early and Mill Lane (eastbound carriageway, chainage 50560 to 49150)	1410	3.5	975,720
Sheet 5 of Drawing 2:  Provision of new barrier between Mill Lane and Winnersh to cover the proposed Hatch Farm Dairies Development (eastbound carriageway, chainage 48870 to 48500)	370	2.5	176120
Sheet 5 of Drawing 2:  Provision of new barrier between Mill Lane and Winnersh to cover the proposed Hatch Farm Dairies Development (eastbound carriageway, chainage 48870 to 48500)	370	3.5	256,040
Sheet 5 of Drawing 2:  Provision of new barrier west of Emmbrook	370	2.5	176120

(westbound carriageway, chainage 46600 to 46970)			
Sheet 5 of Drawing 2: Provision of new barrier west of Emmbrook (westbound carriageway, chainage 46600 to 46970)	370	3.5	256,040