

No.	Type	To Whom (Petition No. (where relevant))	Date Given	Subject	Documentary/ Parliamentary Reference	Action & Comment	Text (where relevant)
25	Assurance	General	20/11/2007	Access to remaining open space	Information Paper D13 - Restitution of Open Space - Version 3 - Paragraph 2.3 - Second Sentence		The nominated undertaker will be required to define worksite boundaries and layouts so as to maintain public access to any remaining public open space where reasonably practicable.
26	Assurance	General	20/11/2007	Sprayed Concrete Lining	Information Paper D23 - Sprayed Concrete Lining - Version 3 - Paragraph 2.3 - First Bullet		The SCL design will, where applicable, comply with design codes and accommodate the full range of safety factors, load factors and material factors in accordance with the British reinforced concrete design code BS8110 or Eurocode equivalent.
27	Assurance	General	20/11/2007	Sprayed Concrete Lining	Information Paper D23 - Sprayed Concrete Lining - Version 3 - Paragraph 2.3 - Sixth Bullet		All SCL designs, both temporary and permanent linings, will have an independent check on the design.
28	Assurance	General	20/11/2007	Sprayed Concrete Lining	Information Paper D23 - Sprayed Concrete Lining - Version 3 - Paragraph 2.3 - Ninth Bullet		The SCL designer will be required to provide 24/7 cover on site to ensure the construction of the works is in accordance with the design and that the assumptions made by the designer are appropriate for the actual conditions.
29	Assurance	General	20/11/2007	Sprayed Concrete Lining	Information Paper D23 - Sprayed Concrete Lining - Version 3 - Paragraph 3.1 - Last Sentence		The nominated undertaker will be required to develop a rigorous risk management programme for the selected tunnelling solution and to monitor the design and construction activities as the work progresses.
30	Assurance	General	20/11/2007	Sprayed Concrete Lining	Information Paper D23 - Sprayed Concrete Lining - Version 3 - Paragraph 4.5		The Promoter will require the nominated undertaker to follow industry best practice in the use of SCL including design, procurement and construction and comply with the recommendations and guidance included within the following documents: The British Tunnelling Society/Association of Insurers' "Code of Practice for Risk Management of Tunnel Works in the UK"; The Health and Safety Executive report "The Collapse of NATM tunnels at Heathrow Airport" (the SCL method was developed following the Heathrow collapse); and The Institution of Civil Engineers guidance on "Sprayed Concrete Linings (NATM) for tunnels in Soft Ground".
461	Assurance	General	23/04/2008	Noise from fixed installations	Information Paper D25 - Noise From Fixed Installations - Version 3 - Paragraph 2.5	See paragraphs 1.1 and 1.2 of the Information Paper for the meaning of fixed installations in this context	The nominated undertaker will be required to design and construct fixed installations (including the forced ventilation shafts which will include noise attenuators on both sides of each fan and other forms of mitigation as necessary, but excluding public address systems and audible warning systems) so that, with additional allowances made for calculation uncertainty, under all reasonably foreseeable circumstances the assessment at the worst-affected residential building, as identified in the ES, obtained by subtracting the existing background noise (see note 1) level (LA90,T) from the rating level LAr,Tr of the fixed installations in normal operation, is not more than +5 dB, determined in accordance with BS 4142:1997. 1 -Defined as that which exists at the time of that the detailed design and is agreed with the local authorities in accordance with Section 3.2 of this IP.
462	Assurance	General	23/04/2008	Noise from fixed installations	Information Paper D25 - Noise From Fixed Installations - Version 2 - Paragraph 2.6	See paragraphs 1.1 and 1.2 of the Information Paper for the meaning of fixed installations in this context	While the degree of attenuation required is site dependent, not least because of different levels of background noise at different sites, the nominated undertaker will (in cases not covered by paragraph 2.9 below) be required to use reasonable endeavours when designing the fixed installations to reduce the noise below the design criterion set out in Section 2.5 where it is practicable to do so.

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463	Assurance	General	23/04/2008	Noise from fixed installations	Information Paper D25 - Noise From Fixed Installations - Version 3 - Paragraph 3.1	See paragraphs 1.1 and 1.2 of the Information Paper for the meaning of fixed installations in this context	With the exception of public address systems and audible warning systems which are addressed solely in Section 4 of this IP, the nominated undertaker will be required to apply the Crossrail design criterion to the totality of all fixed installations at a single Crossrail development and the specific noise source defined by BS 4142:1997 shall mean all the fixed installation noise sources (including mechanical plant and machinery) installed and operated in any location within the Crossrail development. Thus, for example, at a central London station it will apply to the design of the forced ventilation shafts, draught relief shafts and station mechanical ventilation and air conditioning equipment.
464	Assurance	General	23/04/2008	Noise from fixed installations	Information Paper D25 - Noise From Fixed Installations - Version 3 - Paragraph 3.2	See paragraphs 1.1 and 1.2 of the Information Paper for the meaning of fixed installations in this context	When designing all fixed installations other than public address systems and audible warning systems, the nominated undertaker will be required to: - Incorporate the design criterion into contract documents such that it will apply to the design of all the fixed installations that are to be installed and operated in any location within the Crossrail development. - When designing fixed installations, take the further endeavours which are referred to in paragraph 2.6 or 2.9 (as the case may be) to reduce the noise below the design criterion in paragraph 2.5. - Translate the design criterion into specific requirements in specifications for the procurement and operation of Crossrail plant, equipment and machinery for fixed installations taking into account the further endeavours referred to in bullet point 2 above. - Determine the relevant LA90,T levels, to be jointly established with the relevant local authorities. - Procure, install and commission plant, equipment and machinery, including noise attenuation equipment that meets the specific requirements referred to in bullet point three above. - Provide details of the measures undertaken to ensure that, under all reasonably foreseeable circumstances, the design process and procurement process for fixed installations is adequate to achieve compliance with the design criterion taking into account the endeavours referred to in bullet point 2 above (including proposals for maintenance and monitoring) to the relevant local authority whose comments will be taken into account. - Before the fixed installation may be operated, satisfactorily complete the standard suite of acceptance tests required for such plant and provide information on those tests to the relevant local authority.
465	Assurance	General	23/04/2008	Noise from fixed installations - noise from public address systems and audible warning systems	Information Paper D25 - Noise From Fixed Installations - Version 3 - Paragraph 4.1	See paragraphs 1.1 and 1.2 of the Information Paper for the meaning of fixed installations in this context	The nominated undertaker will be required to agree appropriate criteria for assessing noise arising from any new or materially altered public address system and audible warning systems with the relevant local authority, prior to the specification and detailed design of such systems. Such systems shall be designed to meet the agreed noise criteria. In the event that appropriate noise criteria cannot be agreed with a relevant local authority, any dispute will be resolved in accordance with the procedure set down in clause 63 of the Bill (arbitration).
517	Assurance	General	23/04/2008	Noise from fixed installations - noise from public address systems and audible warning systems	Information Paper D25 - Noise From Fixed Installations - Version 3 - Paragraph 2.7	See paragraphs 1.1 and 1.2 of the Information Paper for the meaning of fixed installations in this context	In recognition of the local authorities' preference for rating levels which are no greater than LA90,T-5 for Crossrail, the nominated undertaker will prior to the commencement of procurement of equipment provide to the relevant local planning authority the following information in situations where, despite using reasonable endeavours to reduce noise levels below the design criterion of LA90,T+5 referred to in paragraph 2.5 at the worst-affected residential building, as identified in the ES, the overall rating noise levels associated with tunnel ventilation, draught relief and the operation of plant and equipment at the deep level station sites are still expected to be above LA90,T-5: - the calculated rating levels at the most sensitive receivers under the range of operational modes anticipated, including noise from mechanical fan operation and draught relief; - for tunnel ventilation, the frequency and duration of use of the fans expected as a result of possible congestion and train headway simulations; - details of the performance of noise mitigation incorporated into the deep level station, ventilation shaft and headhouse structures; - a description of the limitations to any or further mitigation being practicable. For the purposes of the above commitment, the term 'deep-level station' refers to stations with sub-surface platforms within tunnels, accessed from ground level.
518	Assurance	General	23/04/2008	Noise from fixed installations - noise from public address systems and audible warning	Information Paper D25 - Noise From Fixed Installations -	See paragraphs 1.1 and 1.2 of the Information Paper for the meaning of	The nominated undertaker will, notwithstanding paragraph 2.5, be required to employ best practicable means in designing and constructing the fixed installations associated with the surface railway and surface stations (including electrical trackside equipment located along

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				systems	Version 3 - Paragraph 2.9	fixed installations in this context, and in the following paragraphs of this IP (i) references to the surface railway are to the Crossrail running lines, and do not include depots and sidings, and (ii) references to surface stations do not include any deep-level station as defined in paragraph 2.7	the surface railway, power supply facilities e.g. transformers located along the surface railway and static noise sources associated with Crossrail at surface railway stations, but excluding public address systems and audible warning systems) with the aim of reducing noise so that, with additional allowances made for calculation uncertainty, under all reasonably foreseeable circumstances the assessment at the worst-affected residential building, as identified in the ES, obtained by subtracting the existing background noise level (LA90,T) from the rating level LAr,Tr of the fixed installations in normal operation, is not more than LA90,T-5, determined in accordance with BS 4142:1997. Where despite the employment of best practicable means, rating levels at the worst-affected residential building are expected to exceed LA90,T-5, the nominated undertaker will prior to the commencement of procurement of equipment provide to the relevant local planning authority the following information: - the calculated rating levels at the most sensitive receivers under the range of operational modes anticipated; - details on the performance of the proposed noise mitigation measures; - a description of the limitations to any or further mitigation being practicable.
466	Assurance	General	20/11/2007	Surface railway noise	Information Paper D26 - Surface railway noise and vibration - Version 2 - Paragraph 5.3		The new surface sections of the railway will be designed and constructed using continuously welded rail to the greatest extent practicable with the objective of reducing noise and vibration due to the operation of the surface railway.
467	Assurance	General	20/11/2007	Surface railway noise	Information Paper D26 - Surface railway noise and vibration - Version 2 - Paragraph 5.4		The design of new surface railway, or alteration of existing surface railway tracks will endeavour to achieve, in all reasonably foreseeable circumstances, predicted <sup>1</sup> operational noise level increase less than 3 dB LAeq,T at the nearest sensitive receptor identified in the ES when calculated in relation to the periods of a day (07:00 to 23:00) and of a night (23:00 to 07:00), although as mentioned in paragraph 4.2 there will be cases where noise will exceed this. The design will include consideration of mitigation measures such as noise barriers. <sup>1</sup> Predictions of operational railway noise will be carried out using the calculation procedure set out in Calculation of Railway Noise (1995) or whichever is the latest edition of that work at the time of modelling.
468	Assurance	General	20/11/2007	Surface railway vibration	Information Paper D26 - Surface railway noise and vibration - Version 2 - Paragraph 6.1 (including Table 1)		The design of the new surface railway, or altered railway, in accordance with the guidance set out in British Standard 6472:1992 "Guide to evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz)", will endeavour to achieve, in all reasonably foreseeable circumstances, predicted operational vibration, expressed as vibration dose value (VDV), at sensitive receptors identified in the ES, no greater than the levels presented in Table 1.
469	Assurance	General	20/11/2007	Surface railway vibration	Information Paper D26 - Surface railway noise and vibration - Version 2 - Paragraph 6.2		Where, when carrying out that design work, vibration at sensitive receptors as identified in the ES, arising from any section new, additional or altered surface railway, is predicted to exceed the levels set out in Table 1, endeavours shall be made to include mitigation measures (for example under-ballast mats) in the design, which are predicted to result in compliance with the levels in Table 1 in all reasonably foreseeable circumstances.
470	Assurance	General	20/11/2007	Surface railway noise and vibration - maintenance	Information Paper D26 - Surface railway noise and vibration - Version 2 - Paragraph 6.2		For those parts of the surface railway that are part of the National Rail network that will be modified by Crossrail, maintenance of them will remain the responsibility of Network Rail. For any parts of the surface railway for the maintenance of which a person other than Network Rail is the nominated undertaker, they are to be maintained in accordance with Railway Group and Network Rail Company Standards. With regard to the generation of vibration and groundborne noise at the wheel/rail interface, the wheels of the Crossrail rolling stock will be maintained, as a minimum, at the level defined by the maintenance requirements necessary to meet the undertaking on this issue set out in Information Paper D10, Groundborne Noise and Vibration.
31	Assurance	General	20/11/2007	Station passenger car parking	Information Paper E1 - Passenger Car Parking - Version 2 - Paragraph 2.3 - Second Sentence		Where spaces are taken temporarily during construction they will in general be reinstated. The nominated undertaker will not replace car parking spaces where the land is permanently required for Crossrail operational reasons.