

Guidance Document

G1323 Noise and Vibration Asset Design Guidance

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1 Purpose

- 1.1 The purpose of this Guidance is to define noise and vibration assessment methodologies and criteria that should be used in the design of new operational assets. LUL assets are often in close proximity to noise and vibration sensitive receptors, e.g. residential properties, offices, theatres etc. When noise and vibration is not controlled LUL receives complaints from these receptors which can be expensive to rectify once an asset is built and operational.

2 Scope

- 2.1.1 LU Category 1 Standards 1-050 "Civil Engineering – Common Requirements" and 1-154 Permanent Way System – Strategy and Interfaces, define the requirement for noise and vibration assessments to be carried out.
- 2.1.2 This Guidance applies to all new operational assets, assets undergoing major upgrade works, or assets being brought back into use after a period of five years or more.
- 2.1.3 The assessment methodologies and criteria described in this document are for residential dwellings. It is recognised that other noise sensitive receptors exist e.g. schools, offices, hospitals, hotels, theatres, churches etc. Assessment methods and criteria for these receptors should be determined on a project by project basis as applicable. It is likely that similar assessment methodologies would apply for these receptors but the criteria may differ (example criteria can be found in BS 8233:2014 Guidance on sound insulation and noise reduction for buildings).
- 2.1.3 Please note that the assessments and criteria provided in this guidance document are not extensive. Individual project stakeholders and local authorities may require further assessments and may apply different criteria.

3 Guidance

3.1 Design Options

- 3.1.1 At the design stage it is normal to consider more than one option. A qualitative high level assessment of the noise and vibration impacts should be carried out for each option; these should be considered for the construction and for the life of the scheme. The noise and vibration impacts of the options should be assessed against any other impacts and practical and economic considerations to ensure that the best scheme design is selected.
- 3.1.2 Important considerations at this stage could include (but not be limited to):
- a) For railways - track type, route, rolling stock type, running speeds; and
 - b) For fixed installations – location (including outlet orientation if applicable) relative to sensitive receptors, operational times, the character of the noise.
- 3.1.3 An example of how the design of a railway route can affect noise is when the route includes tight curves. Tight curves can result in two unwanted noise generating phenomena: rail corrugation and wheel squeal. Rail corrugation can be removed by rail grinding but this is a costly exercise and nearby sensitive receivers may be disturbed by increasing noise levels in between periods of rail grinding as corrugation reappears. Wheel squeal is very difficult to predict and mitigation can be limited as it usually involves increasing rail lubrication which may conflict with safe braking requirements.