

---

Project:	<b>M27 Southampton Junctions</b>	
Doc No:	<b>HE551514-JAC-EGN-PCF3_SS1-RP-LE-0006</b>	
Revision:	<b>P02</b>	
Subject:	<b>DMRB ENVIRONMENTAL ASSESSMENT SENSITIVITY TEST TECHNICAL NOTE</b>	
Prepared by:	J. WARDLE	Date: 21/04/20
Checked by:	H. PEACE	Date: 21/04/20
Reviewed by:	H. PEACE	Date: 21/04/20
Approved by:	P. MCKAY	Date: 21/04/20

---

Limitation: This document has been prepared on behalf of, and for the exclusive use of Jacobs' client (Highways England), and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this document by any third party.

## 1. Introduction

This technical note outlines the conclusions of a sensitivity test across the new DMRB environmental assessment standards (released end of 2019), as instructed by Highways England on 13 January 2020.

The environmental assessment for the M27 Southampton Junctions scheme was completed over summer 2019, with the draft Environmental Assessment Report (EAR) issued in November 2019. The assessment was therefore completed prior to the majority of new DMRB standards being released. Given the advanced state of contract completion, the new DMRB assessment guidance was not adopted for the environmental assessment; this was agreed with Highways England environment SES prior to submission of the EAR and is in line with DMRB GG 101. However, in order to record the decision of not adopting the new guidance, it was agreed with SES that a sensitivity test be carried out to determine if there would be material changes to the assessment conclusions if the new guidance was used.

The sensitivity test has involved addressing three questions for each environmental topic area:

- 1) What are the key differences between the old and new DMRB guidance?
- 2) Would any additional work be required if the new guidance was used (e.g. through additional factors or requirements introduced)?
- 3) Would there be a material difference to the environmental assessment conclusions, particularly the significance of effects, if the new guidance was used?

This sensitivity test does not set out to reassess any factor based on the new DMRB standards. Instead, the purpose is to identify at a high level if there would be any material changes to the assessment outcome if the new guidance were adopted. This has been determined through professional judgement.

## 2. Air quality

### Key differences between old and new guidance

DMRB LA 105 Air Quality supersedes the advice provided in the following documents, which are now withdrawn:

- DMRB Volume 11, Section 3, Part 1, HA 207/07, Air Quality
- Interim Advice Note (IAN) 170/12, Updated Air Quality Advice on the Assessment of Future NO<sub>x</sub> and NO<sub>2</sub> Projections for Users of DMRB Volume 11, Section 3, Part 1 Air Quality

- IAN 174/13, Updated Advice for Evaluating Significant Local Air Quality Effects for Users of DMRB Volume 11, Section 3, Part 1 Air Quality
- IAN 175/13, Updated Air Quality Advice on Risk Assessment Related to Compliance with the EU Directive on Ambient Air Quality and on the Production of Scheme Air Quality Action Plans for User of DMRB Volume 11, Section 3, Part 1 Air Quality
- IAN 185/15, Updated Traffic, Air Quality and Noise Advice on the Assessment of Link Speeds and Generation of Vehicle Data into 'Speed-Bands' for Users of DMRB Volume 11, Section 3, Part 1 Air Quality and Volume 11, Section 3, Part 7 Noise

The main differences between HA 207/07 and the associated IANs, and DMRB LA 105, are tabulated below. Those with a material change are in bold in the final column.

**Table 1: Key difference between LA 105 and HA 207/07 (and associated IANs)**

New standard	Old standard	Conclusion
Road screening criteria for speed based on a change in speed band (both peak and AADT)	Road screening criteria for speed based on speed changes >10 km/hr or > 20 km/hr (for daily average and peak hour respectively)	No material change
Screening for traffic reliability area	Not discussed	No material change
Affected Road Network (ARN) = all roads that trigger screening, plus 200m	ARN = all roads that trigger screening	Slightly larger ARN, but this is included in M27 assessment study area so no material change
Detail on when simple or detailed assessment required	Less detailed guidance on this matter	No material change
More guidance on monitoring	N/A	No monitoring undertaken so not applicable
Ecological receptors include international, national and local sites	Ecological receptors include international and national sites	<b>Material change – There is one known ecology site (Wildern LNR, which is also a SINC) within 200m of the ARN (near junction 7) which was not assessed and would need to be modelled for NOx concentrations.</b>  As the emission rates along Upper Northern Road (the nearest road to Wildern LNR) show an increase between the DM and DS there could be a potential increase in NOx concentrations. In addition to this, nitrogen deposition calculations would be required (see next row).
Always undertaken nitrogen deposition	Only undertaken N deposition if >30ug/m <sup>3</sup> and >0.4ug/m <sup>3</sup> change.	<b>Material change – nitrogen deposition was assessed for some local sites.</b>  Nitrogen deposition analysis was undertaken at four out of nine ecological sites modelled (Windhover Netley Common South, Surrounding SINCS, Netley Common and Peewit Hill 2). The deposition analysis results suggest that there is no significance to deposition caused by the proposed scheme. For the remaining sites the results show that there are no increases in NOx contributions as a result of the proposed scheme. Therefore, the only site that would possibly change the conclusion would be the Wildern LNR site discussed in the above row that was not previously modelled.

New standard	Old standard	Conclusion
NO <sub>2</sub> >Nitrogen dep – uses same conversions as the Environment Agency (0.14 and 0.29 kg N/ha/yr)	0.1 kg N/ha/Yr	<b>Material change, as above.</b>
Motorway – additional speed bands added	N/A	Changes to speed bands have already been incorporated as updated guidance was provided for the M27 assessment
Construction – receptor count at the following distance bands: 0-50, 50-100,100-150,150-200m	Not specified, just count receptors within 200m	Change to how assessment reported but unlikely to affect conclusions
Model construction traffic if construction period >2 years	Model construction traffic if construction period > 6 months	Change but unlikely to affect conclusions
If Pollution Climate Mapping (PCM) link is part of ARN model qualifying features, then tabulate PCM, Highways England and Local Authority modelling results at 4m distance – assessment on whether effects are significant made on professional judgement call, though PCM given lower priority. Recognises issues with PCM data.	Add difference in HE modelling to PCM modelling	<p><b>Material change – PCM receptors have not been modelled.</b></p> <p>There are two PCM links with qualifying features (Census Id 16269 and 7988). There are some modelled receptors along Id 16269 (Kanes Road), R25 and R26 are the closest receptors at 9.5m and 10m from the edge of the road boundary respectively, with predicted NO<sub>2</sub> concentrations of 20.5 µg/m<sup>3</sup> for both receptors in the DS scenario. The concentrations have slightly decreased from 20.7µg/m<sup>3</sup> for R25 and 20.6µg/m<sup>3</sup> for R26 modelled in the DM scenario. Although there are footpaths which would be classed as a qualifying feature along 16269 (Kanes Road) due to the low modelled results for R25 and R26 it is unlikely that there will be any exceedances of the EU Limit Value along this PCM link.</p> <p>PCM link 7988 (A27, Providence Hill), was found to correspond to the ARN. As part of the compliance risk assessment relevant footpath receptors were placed at appropriate locations following DMRB LA 105.</p> <p>To determine whether the air quality for the project aligns with the PCM values in the opening year, 4m receptor points were positioned at the worst-case locations, following the process set out in DMRB LA 105 NO<sub>2</sub> concentrations.</p> <p>These receptors are 25.5m and 26m from the edge of the road respectively, with predicted NO<sub>2</sub> concentrations of 22.2 µg/m<sup>3</sup> for R27 and 20.1 µg/m<sup>3</sup> for R28 in the DS scenario; the concentrations have slightly increased by 0.3 µg/m<sup>3</sup> and 0.1 µg/m<sup>3</sup> respectively. Although there are footpaths which would be classed as a qualifying feature along link 7988 (A27, Providence Hill) due to the low modelled results for R27 and R28 it is unlikely that there will be any exceedances of the EU Limit Values.</p> <p>Therefore, this change in the DMRB guidance is unlikely to result in a change in the conclusion.</p>

## Would any additional work be required?

The changes in the new LA 105 guidance means that local ecological sites (such as local nature reserves, local wildlife sites, nature improvement areas, ancient woodland and veteran trees) within 200m of the Affected Road Network (ARN) need to be considered in the assessment as well as international and national sites. Although not a requirement of the old DMRB guidance, the majority of the local sites within 200m were modelled for NO<sub>x</sub> to address a scoping comment made by Hampshire County Council.

For each of the additional designated sites (one site) not previously modelled, transect receptor points at 10m intervals would need to be modelled, starting from the nearest point of the designated habitat to the road, up to a maximum distance of 200m regardless of whether the habitat extends beyond 200m. These receptors would be modelled for NO<sub>x</sub> and NO<sub>2</sub> concentrations. Nitrogen deposition calculations for all ecological receptors, including those previously modelled but not assessed for nitrogen deposition, would need to be undertaken in line with LA 105 to determine if the effects on the designated sites are significant.

## Would there be any change to assessment conclusions?

Without undertaking the modelling of the additional ecological site, it is not possible to say whether the changes to the assessment guidance would result in a change to assessment conclusions. The previous assessment found that the worst affected sites had a reduction in nitrogen deposition and therefore this is likely to be beneficial to most species but would need an ecologist to provide their view on significance. However, the additional site not previously modelled has a predicted increase in traffic flow near to it, so this is likely to result in an increase in nitrogen deposition; whether this is significant is impossible to say without further work.

## Compliance risk assessment

In accordance with DMRB LA 105 criteria, a total of four qualifying feature receptors were modelled at worst-case locations on public footpaths over 25m from key junctions, along with four validation receptors positioned 4m from the road edge adjacent to each footpath receptor. All were positioned along PCM link 7988 (A27, Providence Hill). NO<sub>2</sub> concentrations were modelled at the receptors using Air Dispersion Model Software (ADMS)-Roads in the Opening Year (2021) DM and DS scenarios, using the same methodology as the local air quality assessment. The adjustment factors from the model verification were applied to the results. However, in this instance, a further adjustment, using the LTTE6 projection factors, was not performed in line with DMRB and JAQU guidance.

### Local model 4m point receptors

None of the four modelled validation receptors were found to exceed the NO<sub>2</sub> EU Limit Value in the modelled DM opening year, or in the PCM model. The project's air quality 4m modelling results were similar to those from the PCM model. The results of the 4m validation receptors are shown in table 2.

**Table 2: Local model 4m validation receptor results**

PCM Road Census ID	4m Validation Receptor ID	2021 Modelled NO <sub>2</sub> (µg/m <sup>3</sup> )	
		PCM Model	Validation Model
7988	PCM_Val_01	23.1	26.2
	PCM_Val_02		22.6
	PCM_Val_03		24.8
	PCM_Val_04		27.4

## Assessment of compliance risk

Of the four footpath receptors modelled, none were found to be in exceedance of the EU limit value in the opening year (2021) DM or DS, or in the PCM model. The results of the qualifying footpath receptors are shown in table 3.

**Table 3: Qualifying receptor results**

PCM Road Census ID	Qualifying Receptor ID	2021 Modelled NO <sub>2</sub> (µg/m <sup>3</sup> )		
		PCM Model	Qualifying Receptors	
			DM	DS
7988	PCM_Rec_01	23.1	26.9	27.6
	PCM_Rec_02		22.9	23.7
	PCM_Rec_03		22.9	23.7
	PCM_Rec_04		27.6	28.4

The assessment concludes therefore that there is no risk from the proposed scheme on the UK's reported ability to comply with the Air Quality Directive. No further assessment is required for PCM receptors and EU Air Quality Compliance.

## 3. Cultural heritage

### Key differences between old and new guidance

DMRB LA 106 Cultural Heritage Assessment supersedes the advice provided in DMRB Volume 11, Section 3, Part 2, HA 208/07, Cultural Heritage, which is now withdrawn.

Formerly guidance on assessing value, impacts and significance of effect was contained within HA208/07 but has since been taken out of the cultural heritage section and is presented within a general environmental assessment chapter: LA 104 Environmental Assessment and Monitoring.

The LA 104 guidance on assessing value is less prescriptive than the one presented in HA 208/07 and provides more scope for professional judgement. Additional advice was provided by Highways England in a training session on the new DMRB guidance which indicated that all designated cultural heritage assets are likely to be of high value, unless circumstances (for example, an asset that has been relocated) indicate that the asset should be of a lower value.

### Would any additional work be required?

No further work is required.

### Would there be any change to assessment conclusions?

Overall the assessment conclusions would remain the same; historic buildings and historic landscapes were scoped out of further assessment due to no significant effects. Archaeology was scoped in due to the potential for unknown archaeological remains to be present in the locations of the temporary site compounds and flood compensation areas, and the necessity to undertake an archaeological watching brief in these locations.

The only change in assessment would be that designated cultural heritage assets (listed buildings and the conservation area) would now be assessed to be of high value rather than medium value. Using the new significance of effect matrix in LA 104, none of the designated assets would experience significant effects during construction or operation of the proposed scheme.

## 4. Landscape

### Key differences between old and new guidance

DMRB LA 107 Landscape and Visual Effects supersedes previous advice contained in the following documents, which are now withdrawn:

- DMRB Volume 11, Section 3, Part 5, Landscape Effects
- IAN 135/10, Landscape and Visual Effects Assessment

LA 107 aligns guidance for landscape and visual assessment for highway schemes with the methodologies described in the third edition of Guidelines for Landscape and Visual Impact Assessment (GLVIA3) which came into force on 17 April 2013. As a result, judgements on the sensitivity of receptors are now more explicitly related to the concepts of value and susceptibility. Value is defined as the *“relative value or importance of a landscape’s quality, special qualities including perceptual aspects such as scenic beauty, tranquillity, or wildness, cultural associations or other conservation issues”* and susceptibility is defined as the *“ability of a defined landscape or visual receptor to accommodate the specific proposed change without negative consequences.”*

The textural scales for sensitivity have been refined under the new guidance with five categories given, namely; very high, high, medium/moderate, low and negligible compared to the three categories of; high, moderate and low given in the previous guidance. The textural scales for magnitude of effect (impact/change) remain essentially the same. Under the guidance in LA107 the overall significance of effect is still derived as a function of sensitivity of receptor and magnitude of effect, using the significance matrix contained in LA 104 with the application of professional judgement.

LA 107 allows for judgements on susceptibility to take account of the visibility of existing highway infrastructure. Receptors with prominent views towards highway infrastructure can therefore be judged to have low susceptibility to change. Linked to this is the option under LA 107 guidance to describe the visual sensitivity of residents as either high or moderate depending on the particular circumstances of the receptor. Under the previous guidance, residents were generally considered to have high sensitivity. The new guidance also identifies receptors engaged in specific activities for enjoyment of dark skies and indicates that these would have very high sensitivity.

### Would any additional work be required?

It is not considered that material additional work would be required in following the guidance of LA 107 compared to previous guidance. There is greater emphasis, however, on the identification of enhancement opportunities for the landscape as an integral part of project design which gives greater scope for a more creative approach to landscape design beyond merely providing mitigation such as screening.

The guidance of LA 107 also gives weight to the importance of night-time characteristics. For some projects which may potentially impact designated ‘dark sky’ areas, these impacts may need to be drawn out in a more detailed sub section. This is not, however, the case for the proposed scheme.

While the guidance in LA 107 still involves assessing landscape and visual effects independently there is also an additional requirement to combine the assessment outcomes into a single conclusion of the likely significant effect on landscape and visual amenity.

### Would there be any change to assessment conclusions?

LA 107 allows for some residents to be given the lower sensitivity of moderate compared to the previous guidance under which they would all have high sensitivity. For the proposed scheme the moderate sensitivity would be appropriate for many of the residential receptors due to the prominence of the existing highway infrastructure including the M27 motorway and its associated traffic. It is unlikely however, that

this would result in material changes to the overall significance of visual effects reported for the residential receptors.

Other aspects of LA 107, such as the finer grained textural scales for sensitivity of receptor, may also result in slight changes to how the assessment is reported within the EAR, but these are unlikely to make a material difference to the conclusions on significance of effects.

In summary, given the above, the overall assessment conclusion for Landscape would be unlikely to change if LA 107 was adopted compared to the existing conclusions, and the reported residual effects would remain slight and not be considered significant.

## 5. Biodiversity

### Key differences between old and new guidance

DMRB LA 108 Biodiversity supersedes previous advice contained in the following documents, which are now withdrawn:

- DMRB Volume 11, Section 3, Part 4, Ecology and Nature Conservation
- IAN 130/10, Ecology and Nature Conservation: Criteria for Impact Assessment

Guidance within LA 108 is broadly similar to guidance within previous DMRB and IAN guidance.

### Would any additional work be required?

No additional work would be required; the new guidance emphasises the use of best practice methods when gathering baseline data, which are in line with those followed when undertaking the assessment. In addition, there is an increased requirement to undertake monitoring where significant effects are reported, however, no significant effects were determined from the assessment and therefore no additional monitoring would be required.

### Would there be any change to assessment conclusions?

There would be no changes to the assessment conclusions determined using the new guidance and the reported effects would remain the same (not significant).

## 6. Geology and soils

### Key differences between old and new guidance

DMRB LA 109 Geology and Soils supersedes previous advice contained in the following documents, which are now withdrawn:

- DMRB Volume 11, Section 3, Part 6, Land Use
- DMRB Volume 11, Section 3, Part 11, Geology and Soils

The new standard introduces no new factors; however, it does provide greater clarity on how to assess impacts on geology and soils which includes effects from contamination on human health, surface water, and groundwater. The new guidance includes new sensitivity and magnitude assessment criteria which were absent from the old guidance. The new guidance also makes clear that impacts related to use and/or sterilisation of mineral resources should be reported within DMRB LA 110 Materials Assets and Waste – previously guidance was ambiguous which meant these impacts were often reported under Geology and Soils.

## Would any additional work be required?

No additional work would be required. The Geology and Soils EAR chapter meets the fundamental requirements of the new guidance (assessment of impacts on important geology, finite soil resources and effects from existing contamination), albeit the inclusion of new sensitivity and magnitude assessment criteria would have resulted in a slightly modified presentation of the impact assessment.

## Would there be any change to assessment conclusions?

There would be no fundamental changes to the conclusions of the Geology and Soils assessment if the new guidance was adopted, with residual effects assessed as not significant.

## 7. Material assets and waste

### Key differences between old and new guidance

DMRB LA 110 Material Assets and Waste supersedes previous advice contained in the following guidance documents, which are now withdrawn:

- IAN 153/11, Guidance on the Environmental Assessment of Material Resources
- Major Projects' Instructions (MPI) MPI-57-052017 'Environmental Impact Assessment: Implementing the Requirements of 2011/92/EU as amended by 2014/52/EU (EIA Directive)' which was provided to supplement the approach set out in IAN 153/11, and which introduced significance criteria for the Material Assets and Waste factor for the first time.

Whilst the assessment study area and significance criteria are broadly the same as those provided by the previous MPI-57-052017 guidance, LA 110 supersedes all other aspects of IAN 153/11 in relation to assessment methodology<sup>1</sup>; including, but not limited to, the removal of simple and detailed assessment levels. LA 110 also descopes any assessment of embodied carbon emissions from this factor.

LA 110, unlike MPI-57-052017, now includes very precise and deliberate language, specifically "OR", "AND" or "AND/OR" after each descriptor of effect to denote which significance effect category should be applied. The descriptors for the Material Assets element are generally summative (Large, Moderate, Slight and Neutral Effects), and all descriptors typically need to be met in full in order to assign a relevant significance category (i.e. with the notable exception of a Large Effect which can be assigned when a project sterilises >1 mineral safeguarding site and/or peat resource). Whereas the descriptors of effect for the waste element are either standalone (Very Large and Neutral Effects) or summative (Large, Moderate and Slight Effects), where again all descriptors need to be met in full in order to assign a given significance category.

LA 110 also changes the first descriptor of effect for the Material Assets element of this factor from a criterion based on what percentage of materials would be sourced internationally or nationally, to one based on what percentage of overall material recovery / recycling of non-hazardous construction and demolition waste would be achieved to substitute use of primary materials. A number of other minor changes were also made to the descriptors of effect, including which significance of effect levels are now deemed significant for the purposes of assessment.

Furthermore, LA 110 introduced a target for the recovery of construction and demolition waste on its projects as a mitigation requirement. All projects should now aim to achieve at least 90% (by weight) material recovery of non-hazardous construction and demolition waste.

---

<sup>1</sup> Specifically, new guidance covering scoping, baseline scenario, data collection and design and mitigation.



## Would any additional work be required?

Although the Material Assets and Waste assessment was first introduced in 2018 as part of Revision 1 to MPI-57-052017, the methodology and assessment guidance provided was high level and open to a degree of professional judgement, especially with regards to the reporting of the environmental assessment and the application of significance criteria.

The Material Assets and Waste assessment in the EAR was based on MPI-57-052017. This involved making a reasoned conclusion on whether the construction of the proposed scheme is likely to have a significant effect on the environment in relation to the use of material assets or the generation and management of waste. The assessment was based on the application of professional judgment to the significance criteria provided in MPI-57-052017.

Some additional work would naturally be required to meet the new standard in full, however, given the small scale of the proposed scheme and the limited revisions to the Material Assets and Waste standard, any changes would likely be minor.

One of the key changes would potentially be to bring the assessment of minerals safeguarding sites and peat resources within the scope of the assessment. This is currently assessed in the EAR as part of the Geology and Soils factor and is therefore considered a deviation from the LA 110 standard. It is assumed that the proposed scheme is unlikely to sterilise (substantially constrain/prevent existing and potential future use of) any mineral safeguarding sites within the study area given that the proposed scheme is predominately a series of online improvements, with limited construction outside the existing highway boundary.

## Would there be any change to assessment conclusions?

Based on the new environmental assessment standard and revised significance criteria in LA 110, it is likely that the Material Assets factor would remain not significant, as likely significant effects will continue to not be realised.

This is because whilst the proposed scheme is likely to meet all of the Material Assets and Waste descriptors of effect for a slight adverse effect, it is not anticipated that it will meet all of the significance category descriptors for a moderate or large adverse effect. As only moderate or greater effects are considered significant, the overall effect would be assessed as not significant. This assumption is supported by both professional judgement and published government and industry benchmarks and key performance indicators (KPI).

Although LA 110 provides a better developed / defined standard for this factor, this is broadly in line with the assessment that was undertaken for the M27 EAR. If the new standard was adopted in full, there may be some slight changes to how the environmental assessment is reported within the EAR, but these are unlikely to result in difference (worsening) of the reported likely significant effects.

In summary, given the above, the overall assessment conclusion for the Material Assets and Waste factor would be unlikely to change if LA 110 was adopted in full compared to the existing conclusions, and any residual effects would at worst be limited to not-significant slight adverse effects when applying the new significance criteria.

## 8. Noise and vibration

### Key differences between old and new guidance

DMRB LA 111 Noise and Vibration supersedes the advice provided in the following documents, which are now withdrawn:

- DMRB Volume 11, Section 3, Part 7, HD 213/11, Noise and Vibration

- IAN 185/15, Updated Traffic, Air Quality and Noise Advice on the Assessment of Link Speeds and Generation of Vehicle Data into 'Speed-Bands' for Users of DMRB Volume 11, Section 3, Part 1 Air Quality and Volume 11, Section 3, Part 7 Noise

The key differences between the old guidance (i.e. HD 213/11) and the new guidance (i.e. LA 111) are:

- There are more mandatory requirements in terms of assessment within LA 111, and the general document is more logical and concise.
- LA 111 provides greater flexibility in determining the study area and relies upon an element of professional judgement.
- HD 213/11 provided no specific requirements for whether to undertake baseline noise surveys, although it did provide some advice if undertaking surveys. Emerging advice over the last few years from Highways England was to only undertake baseline noise surveys if they can be justified (i.e. it can be justified that the results from the surveys will be used). Within LA 111 there is the recommendation to undertake noise baseline surveys in order to validate the noise model and provide information for public consultations.
- In HD 213/11 there was no approach provided for determining whether an effect was significant. This is now provided within LA 111, which is based upon emerging guidance from Highways England over the past 18 months.
- The noise effect levels to use (i.e. the LOAEL and SOAEL) were not defined within HD 213/11 as the definitions did not exist in 2011. These are now defined within LA 111 and adopt the levels that have been used on Highways England schemes for the past five years.
- The requirement for the assessment of nuisance is not contained within LA 111.
- Within HD 213/11, the change in noise at night was only reported in the long term (i.e. 15 years after opening). Within LA 111 there is the requirement to report the change in noise at night in both the short and long term.
- The assumption to use for the performance of an existing low noise surface has changed between the two documents. Within HD 213/11 an existing low noise surface was assumed to have a performance of  $-2.5$  dB(A) in relation to Hot Rolled Asphalt. In LA 111 the requirement is to use a performance of  $-3.5$  dB(A) for an existing low noise surface.
- LA 111 no longer requires the use of speed banded traffic data. Although this was not a requirement within HD 213/11, it was a requirement of IAN 185/15 that was published after HD 213/11.

## Would any additional work be required?

In order to fully comply with LA 111 there would be additional work required. This is as follows:

- Noise surveys should be undertaken in order to validate the noise model, followed by the validation process.
- Consideration would need to be given to changes to the study area, and it is likely it would be reduced.
- The noise model and assessment would need to be undertaken in order to use traffic data that is not speed banded.
- The noise model would need to be updated to take account of changes to the assumed surface correction for an existing low noise surface. This would only be relevant for the section of the M27 within the noise model.
- The reporting of effects and determination of whether an effect is significant would need to be undertaken in line with the LA 111 guidance, including the requirement to report the night-time impacts in the short term.

## Would there be any change to assessment conclusions?

A number of changes have been made to LA 111 that would result in a different approach being taken to both the noise modelling and the assessment.

It is considered that the determination of the study area may result in a slightly smaller area being considered but this would not change the conclusions. Not using speed banded traffic data would change the predicted noise levels but not to level where significant effects would be identified. The method for determining whether there are significant effects has changed and now requires other factors to be considered when the change in noise is predicted to close to 3 dB(A). Since there are no predicted increases in noise close to this level in the short term, it is considered the conclusions are unlikely to change.

In summary it is considered that if the assessment had been undertaken using LA 111 then there would be no material change to the conclusions, which is that there would be no significant effects.

## 9. Population and health

### Key differences between old and new guidance

DMRB LA 112 Population and Human Health supersedes previous advice contained in the following documents, which are now withdrawn:

- DMRB Volume 11, Section 3, Part 6, Land Use
- DMRB Volume 11, Section 3, Part 8, Pedestrians, Cyclists, Equestrians and Community Effects
- DMRB Volume 11, Section 3, Part 9, Vehicle Travellers
- MPI-57-052017, Environmental Impact Assessment: Implementing the Requirements of 2011/92/EU as amended by 2014/52/EU (EIA Directive)

The new standard introduces a new factor (human health) and removes factors that were previously required (assessment of driver stress and vehicular user severance).

The assessment guidance for land use and accessibility (including walkers, cyclists and horse riders (WCH)) in LA 112 is broadly the same as the previous DMRB guidance in terms of what factors need to be assessed. However, LA 112 does introduce new sensitivity and magnitude assessment criteria, which were mostly absent from the old guidance.

### Would any additional work be required?

Human health is a new factor introduced by LA 112. Although a health assessment was specified in MPI-57-052017, the methodology and assessment guidance was very high level and open to professional interpretation. The health assessment in the EAR was based on MPI-57-052017, using the outputs of other topic assessments to make a reasoned conclusion on whether the scheme is likely to have a significant impact on human health. LA 112 provides a more defined standard and structure for what is expected in a health assessment. Some additional work would likely be required to meet the new standard, however, given the small scale of the project and the limited scope of the health assessment, any changes would likely be minor.

A previous requirement of DMRB Volume 11, Section 3, Part 9 (Vehicle Travellers) was to undertake an assessment of driver stress and vehicular user severance. This was undertaken for the M27 EAR but is no longer a requirement of LA 112. As such, this assessment could be removed from the EAR if the new guidance was adopted.

## Would there be any change to assessment conclusions?

Land use and WCHs were scoped out of the environmental assessment. Based on the new assessment criteria in LA 112, it is likely these factors could remain scoped out of the assessment if the new standard was adopted, as significant effects are unlikely. This is because the scheme will only involve limited land take outside the highway boundary and will not affect agricultural land, development land, community land, or land allocated for housing.

Although LA 112 contains a more defined standard for a human health assessment, this is broadly in line with the assessment that was undertaken for the M27 EAR. If the new standard was adopted, there may be slight changes to how the assessment is reported within the EAR, but these are unlikely to make a material difference to the conclusions.

In summary, given the above, the overall assessment conclusion for Population and Health would be unlikely to change if LA 112 was adopted compared to the existing conclusions, and the reported effects would remain not significant.

## 10. Road drainage and the water environment

### Key differences between old and new guidance

DMRB LA 113 Road Drainage and the Water Environment supersedes previous advice contained in DMRB Volume 11, Section 3, Part 10 HD45/09 Road Drainage and the Water Environment.

The new standard now requires consideration of groundwater dependent terrestrial ecosystems (GWDTE), hydromorphological assessment, and Water Framework Directive (WFD) assessment. The remaining guidance is broadly the same as that documented in the previous DMRB guidance in terms of what factors need to be assessed. However, LA 113 does introduce a change in the importance/value criteria for surface waters which is now related to the Q95 and whether a watercourse is designated as a WFD waterbody. Magnitude of impact criteria have also been introduced related to GWDTE and WFD. There is now a requirement that the EAR shall conclude whether the project is in compliance with the WFD or not.

LA113 introduces changes to the way the importance of water environment attributes is assessed in terms of flood risk, with importance now based on the sensitivity of receptors (defined using definitions from the Technical Guidance to the National Planning Policy Framework) rather than numbers of properties that would be impacted. A 'no change' magnitude is also introduced.

### Would any additional work be required?

The introduction of LA113 requires additional work compared to HD45/09 in terms of assessing GWDTE, hydromorphology, and WFD. However, due to the nature of the site (underlain mostly by London Clay and lack of designated sites within the vicinity of the scheme) there are no GWDTEs affected by the scheme, although this was not specifically stated. Likewise with WFD, as the WFD waterbody is some distance downstream (outside the study area) a WFD assessment was scoped out, however, the reasoning for this was reported in the EAR. Hydromorphology was included in the assessment as best practice, in the absence of it not being a requirement of HD45/09.

LA113 requires a simple level groundwater quality assessment to be undertaken (using what was previously Method C in HD45/09) in certain circumstances which would be applicable for this project as discharges to ground are proposed via filter drains.

No significant additional work would be required for the flood risk aspects of the assessment, with a re-defining of receptor sensitivity, and therefore importance, being all that would be required.

## Would there be any change to assessment conclusions?

The new criteria for determining importance/value is based upon the Q95 of a watercourse. The larger the Q95 the greater the importance of a receptor (also influence by WFD status). This is unlikely to affect the importance/value that has been assigned to Watercourses A and C, however, it may affect the importance/value given to Watercourse B as this has a larger catchment area. The discharge to this watercourse also failed the HAWRAT assessment with the proposed drainage attenuation (a dry pond). Should this watercourse be of higher importance under the new guidance, then the significance of effect will also be greater. However, the EAR identified additional mitigation (wet ponds and ditches), which would reduce effects to neutral. Therefore, with this mitigation in place, the effect on Watercourse B would remain as not significant regardless of whether the new LA 113 standard was adopted.

Given that the proposed flood mitigation ensures no change in flood risk off-site, no change in assessment conclusions would be anticipated relating to flood risk.

## 11. Climate change

### Key differences between old and new guidance

DMRB LA 114 Climate supersedes previous advice contained in the following documents, which are now withdrawn:

- MPI MPI-57-052017, Environmental Impact Assessment: Implementing the Requirements of 2011/92/EU as amended by 2014/52/EU (EIA Directive)

The new standard covers a new factor – climate - not previously included in DMRB or IAN guidance, but was covered at a high level within MPI-57. The new standard includes the requirement to assess the impact of the scheme on climate change (i.e. through its carbon emissions), and the impact of future climate change on the scheme (i.e. through changes in temperature, rainfall, etc.). In this regard, the new standard is broadly the same as MPI-57 (albeit with more detail on how the assessment should be carried out).

### Would any additional work be required?

Although climate is a new factor introduced by LA 114, it was included as a requirement in MPI-57. The M27 climate assessment was based on the guidance within MPI-57, which included an assessment of the scheme's vulnerability to climate change (scoped out of the M27 assessment), a calculation of construction embodied carbon emissions, and quantifying the operational carbon emissions from road user emissions.

LA 114 is more prescriptive in terms of the lifecycle stages that carbon should be reported on. The M27 EAR included operational carbon, as well as embodied carbon from construction materials (i.e. product stage), but not the construction process stage (e.g. energy from construction plant and processes). It was recommended that carbon from this lifecycle stage be calculated at detailed design when more data and information on the construction methodology was available.

### Would there be any change to assessment conclusions?

The vulnerability of the project to climate change was scoped out of the environmental assessment. Based on the new assessment criteria in LA 114, it is likely that this factor could remain scoped out of the assessment if the new standard was adopted. This is because a high level exercise was carried out to identify the elements of the scheme that could be impacted by future climate changes, and it was found that with the exception of increased flood risk, all changes were likely to be negligible. Flood risk was covered within the road drainage and the water environment chapter.

Although LA 114 contains a more defined standard for a climate assessment, this is broadly in line with the assessment that was undertaken for the M27 EAR. There may be additional requirements to calculate carbon at lifecycle stages not considered in the M27 EAR (e.g. the construction process stage), however, it is unlikely this would change the carbon footprint to the point it would constitute a 'significant' effect. If the new standard was adopted, there may be slight changes to how the assessment is reported within the EAR, but these are unlikely to make a material difference to the conclusions.

In summary, given the above, the overall assessment conclusion for Climate would be unlikely to change if LA 114 was adopted compared to the existing conclusions, and the reported effects would remain not significant.

## 12. Conclusion

It is unlikely that there would be material changes to the M27 environmental assessment conclusions from adopting new DMRB assessment standards, and the assessment conclusions would remain the same (i.e. no significant environmental effects).

One potential exception to this is the Air Quality factor. The new LA 105 standard requires all nature sites within 200m of the ARN to be modelled (there is one known site – a LNR and SINC – which was not modelled). It is not possible to determine if there would be a change to the assessment conclusions without undertaken additional modelling and assessment work, which is outside the scope of this sensitivity test.