Manual for Development of Documents

Part 3 – Drafting rules

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1. Introduction

This Manual for Development of Documents (MDD) is published by National Highways to give procedures, processes, instruction, and advice for the development of documents relating to the planning, preparation, design, construction, management, and demolition of highway works on the UK Overseeing Organisations' motorway and all-purpose trunk roads.

The documents referred to in this Manual are collectively called requirements and advice documents (RADs).

This Manual is made up of three parts:

- Part 1 Governance of document development
- Part 2 Document layout and style
- Part 3 Drafting rules

Different verb forms are used in this Manual to make a distinction between requirements and advice. Specifically:

- the verb 'must' indicates a legislative/regulatory requirement;
- the verb 'shall' indicates a requirement of the Overseeing Organisation;
- the verb 'should' indicates advice expressed as a recommendation;
- the verb 'may' indicates an advice expressed as a permissible approach;
- the verb 'can' or verbs expressed in the present tense other than 'must', 'shall', 'should' and 'may' are used to introduce notes, which provide a short clarification of a concept or statement of fact.

Publication of technical documents by other organisations is at their own prerogative and liability, and they need not seek consent for application of this Manual.

For any queries on this Manual, please contact the National Highway's Technical Standards Group (TSG) at standards_enquiries@nationalhighways.co.uk

2. Scope

2.1 This Manual for Development of Documents (MDD) shall be followed by those responsible for the review, development, and publication of:

1. Design Manual for Roads and Bridges (DMRB)
2. National Application Annexes (NAAs) to relevant DMRB documents contained in the DMRB;
3. Manual of Contract Documents for Highway Works (MCHW)
4. Chief Highway Engineer Memoranda (CHE Memos).

NOTE *In this Manual, the above documents are collectively referred to as requirements and advice documents (RADs), except where specific reference is being made to a particular type of document. They represent a key component of the technical governance for highway works.*

2.2 The information given in RADs shall be used for the Overseeing Organisations' motorway and all-purpose trunk roads in accordance with GG 101 "Introduction to the Design Manual for Roads and Bridges (DMRB)".

[DRAFTING NOTE: Volume 0 of the MCHW is being developed into an introduction document that is currently being reviewed]

2.3 This Manual shall be followed by all those involved in the development of RADs within National Highways (see MDD part 1 for roles and key responsibilities).

NOTE 1 *The other Overseeing Organisations have their own governance processes, which are to be followed where development of a RAD is to be resourced by one of them.*

NOTE 2 *Although National Highways generally provides the resources required for the publication of RADs, the documents that comprise the two main document sets, i.e. the DMRB and the MCHW, are produced in collaboration with the other Overseeing Organisations.*

NOTE 3 *This Manual does not cover technical matters, which are the responsibility of the technical author and the drafting team.*

2.3.1 Any other organisations who wish to adopt the principles and guidance of this Manual should take account of their own organisational needs.

2.4 Specialists responsible for cross-cutting disciplines such as health and safety, carbon management, sustainable development and good design, equality, diversity and inclusion, customer satisfaction, commercial aspects shall contact the National Highways' Technical Assurance and Governance Group (TSG) if they consider that changes or additions are required to this Manual.

3. Terms, definitions, and abbreviations

Terms and definitions

3.1 For the purpose of this Manual, the terms and definitions given in this section shall apply.

NOTE *In addition to the terms given in this section, Annex 3A provides definitions that are specific to European Union (EU) Regulations and Directives.*

Advice

Optional provision conveying advice on a specific topic and helping the user understand how to fulfil the requirement.

Chief Highway Engineer Memoranda (National Highways only)

Means of providing internal information / communication / procedures in connection with the works on National Highways' motorway and all-purpose trunk road network.

Clause

Paragraph providing a requirement or a requirement and related advice.

Collaborative Authoring and Review System

Tool used for the authoring and review of DMRB and MCHW documents.

Construction Works

Everything that is constructed or results from construction operations in accordance with BS ISO 6707-1.

Constructor requirements

Requirements contained in the SHW both as core requirements (i.e. common across the Overseeing Organisations), Nationally Determined Requirements (i.e. those relevant to a specific Overseeing Organisation) and Work Specific Inputs.

NOTE 1 *Constructor requirements will apply for every contract in which the associated objects, materials or activities are specified.*

Consultation report

Deliverable that is part of an overall technical document management system, which is used to record the people and organisations that have been consulted or simply informed during the Technical Standards Committee process and to provide a summary of the consultation including any items raised by the consultees that have been agreed to be addressed in future work.

Content Specialist

Person supporting the delivering of high quality RADs fully in line with this Manual for the Development of Documents (MDD).

Departures Approval System (DAS)

The National Highways system for submitting and seeking approval for departures. Other overseeing organisations can have similar systems for tracking the submission and approval of departures.

Design, Build, Finance and Operate (DBFO)

Delivery approach through which a single entity designs, builds, finances and operates a project for a specified period.

Document Development Plan

Deliverable that is part of an overall technical document management system, which is used to plan and define the directions of development work for RADs.

EU Directive

Directives are binding in terms of goals but it is left up to the member states to decide what action they need to take to achieve those goals.

NOTE *Directives require enabling legislation to transpose them into member state law.*

EU Regulation

Regulations are conventional acts of a national legislature.

NOTE *Regulations are directly applicable in that they do not need to be turned into national law; they are binding in their entirety and take immediate effect on a specific date.*

European Standardisation Organisations (EOSs)

European Committee for Standardisation (CEN), European Committee for Electrotechnical Standardisation (CENELEC) or European Telecommunications Standards Institute (ETSI).

Group Manager

National Highways leader accountable for a programme often referred to as a portfolio, i.e. a structured collection of Projects.

High-level narrative

Summary document for approvers and authorisers of category A and B changes in the DMRB and MCHW to give a clear narrative of key changes made to an existing document or key items covered in a new document.

Instructions for Specifier (IfS) document

Published form of a document showing both the constructor requirements and the specifier instructions.

Impact assessment report

Deliverable that is part of an overall technical document management system, which is used to identify the impacts of the RAD development work (including when there is no impact or a negative impact) on the following aspects:

- health safety and wellbeing;
- equality, diversity and inclusion;

- carbon management, sustainable development and good design;
- customer satisfaction;
- commercial aspects;
- other aspects including policy, legal, contractual implications

It also contains information on opportunities of innovation that can be realised implementing the RAD under consideration and provides information about publication and dissemination plans as needed.

Instructions for Specifier (IfS) document

Published form of a document showing both the constructor requirements and the specifier instructions.

Motorway and all-purpose trunk roads

Collective term to indicate those parts of the UK highway and road network for which one of the Overseeing Organisations is or acts on behalf of the highway or road authority.

NOTE *Department for Infrastructure Northern Ireland also manages local roads and their application is dealt with through National Application Annexes in the DMRB.*

National Highway Authority

National Highways operating under licence from the Department for Transport (DfT).

NOTE *The term 'National Highway Authority' is for use specifically within the context of the Construction Products Regulation.*

Overseeing Organisations

National Highways and the highways or roads authorities of Scotland, Wales and Northern Ireland and their successors.

NOTE *The meaning of Overseeing Organisation is typically defined by the contract under which the works are procured.*

Requirement

Provision conveying criteria to be fulfilled in order to comply with the document.

Requirements and advice documents (RADs)

Collective term for Design Manual for Roads and Bridges (DMRB) documents, National Application Annexes (NAAs) to the DMRB or Nationally Determined Requirements (NDRs) for MCHW, Specification for Highway Works (SHW), Instructions for Specifiers (IfS), Works Specific Inputs (WSI), Highways Construction Drawings (HCD), Chief Highway Engineer Memoranda (CHE Memos).

Safety Engineering and Standards (SES) Directorate

National Highways directorate providing professional and technical solutions to outward facing parts of the organisation.

NOTE *Safety Engineering and Standards was formerly Professional and Technical Solutions (PTS) Directorate and NetServ.*

Specification for Highways Works (SHW) document

Published form of a document only showing constructor requirements.

Technical Standards Group (TSG)

National Highways team responsible for the process of developing and publishing RADs.

NOTE *TSG was formerly called Technical Assurance and Governance Hroup (TAGG).*

Technical Author

Person responsible for sponsoring a RAD through the development process.

NOTE 1 *Generally technical authors are employed by National Highways or one of the other Overseeing Organisations.*

NOTE 2 *The term "technical author" replaces the term "document owner". Document ownership now resides with the TSC chair of the discipline relevant to the document under consideration.*

NOTE 3 *Technical authors can be supported by authoring teams including technical specialists in the Overseeing Organisations or from the supply chain.*

Technical Standards Committee (TSC)

A committee formed to provide peer review, in order to guide and advise on the production and development of RADs.

NOTE *Technical Standards Committees (TSCs) form an essential part of the governance process by which National Highways develops new and updates existing RADs. They are peer review / governance committees of invited members who represent various interested parties from National Highways, other governmental bodies and parts of the highways industry.*

Technical Specialist

Person employed by the Overseeing Organisations or individual from a supplier firm providing specific technical support.

UK legislation

UK Regulations are conventional acts of a national legislature.

NOTE *Regulations are directly applicable in that they do not need to be turned into national law; they are binding in their entirety and take immediate effect on a specific date.*

United Kingdom Standardisation Organisations (UKSOs)

DBT Committee for Standardisation designates UK designated standards.

Works specific requirements

Works specific content to be used in conjunction with relevant SHW constructor requirements for the particular scheme/project.

Works specification

Set of requirements dealing with the works, which can include requirements on geometry, constructor design, performance, activities, verification, documentation submission and limitations of construction activities.

NOTE *Work specification consists of the SHW and the works specific requirements.*

Abbreviations

CARS	Collaborative Authoring and Review System
CHE	Chief Highway Engineer
DAS	Departures approval system
DBFO	Design, Build, Finance and Operate
DBT	Department for Business and Trade
DDP	Document development plan
DMRB	Design Manual for Roads and Bridges
EqIA	Equality Impact Assessment
IfS	Instructions for Specifier
MCHW	Manual of Contract Documents for Highway Works
MDD	Manual for Development of Documents
NAA	National Application Annex
NDR	Nationally Determined Requirement
NDS	Nationally Determined Section
NEC	New Engineering Contract
RAD	Requirements and advice document
SD	Sustainable development
SES	Safety Engineering and Standards
SHW	Specification for Highway Works
SRA	Safety risk assessment
TSG	Technical Assurance and Governance Group
TPB	Technical Project Board
TSC	Technical Standards Committee (replacing TPB)

4. Approach to document development

4.1 The stepped approach for document development presented in Diagram 1 shall be followed.

NOTE *Diagram 1 shows the steps to draft RADs and the relevant sections of this Manual that need to be consulted as the drafting develops.*

Diagram 1 Approach to document drafting

Step	MDD Parts and Sections
Step 1 – Technical author identifies document author(s) if required.	**MDD Part 1**
Step 2 – Technical author selects appropriate RAD type.	**MDD Part 1, Section 5**
Step 3 – Technical author organises initial consultation and development strategy meeting.	**MDD Part 3, Section 4**
Step 4 – Technical author develops the document development plan.	
Step 5a – Technical author drafts the document.	**MDD Part 1, Section 5 for RAD scope** **MDD Part 2, Sections 4 to 8 for RAD layout** **MDD Part 2, Sections 9 to 15 for RAD clause style** **MDD Part 3, Sections 5 to 7 for drafting rules** **MDD Part 3, Section 12 for performance-based reqs** **MDD Part 3, Sections 13 to 15 for health and safety, carbon management, sustainability and good design, equality and diversity impacts** **MDD Part 3, Annex 2A for compliance with legislation**
Step 5b – Technical author follows the process for withdrawing the RAD as relevant.	**MDD Part 3, Section 11**
Step 6 – Technical author engages content specialists in a timely manner.	**MDD Part 1, Section 11**
Step 7 – Technical author updates the document following TSC comments.	**MDD Part 1, Sections 11 and 13**
Step 8 – Technical author finalises the document and supporting documentation.	**MDD Part 3, Section 4**

Pre-drafting process

Initial consultation and development strategy meeting

4.2 When drafting a new RAD or reviewing an existing one, the technical author shall organise an initial consultation and development strategy meeting with relevant stakeholders to discuss specific needs, identify key risks and issues that need to be addressed in the document, and set the criteria by which the final document is considered a success.

NOTE 1 *Relevant stakeholders to the initial consultation and development strategy meeting comprise technical author, initial peer reviewers, Technical Standards Committee (TSC) members and document authors of the other Overseeing Organisations.*

NOTE 2 *The initial consultation and development strategy meeting aims at reducing the risk of disagreement in subsequent stages of review and streamlining the approval process by involving TSC members at the beginning of the development process. It is also relevant to discuss the strategies to deal with Overseeing Organisations' specific requirements.*

Document Development Plan (DDP)

4.2.1 A document development plan shall be developed by the technical author at the initial consultation and development strategy meeting before starting the drafting process in accordance with the requirements of MDD part 1.

NOTE 1 *The document development plan aims at defining the criteria by which the final document is considered a success, including its structure, specific content, key stakeholders to be consulted or kept informed, links to other National Highways' document sets.*

NOTE 2 *Discussing and agreeing the document development plan will help mitigate the risk of significant rework in subsequent stages of the drafting process due to the lack of clear understanding of the document's needs.*

NOTE 3 *A template for the document development plan for DMRB is provided in SharePoint:*
https://highways.sharepoint.com/sites/UpdateoftheMCHWtrainingmaterials/DMRB/Forms/AllItems.aspx?newTargetListUrl=%2Fsites%2FUpdateoftheMCHWtrainingmaterials%2FDMRB&viewpath=%2Fsites%2FUpdateoftheMCHWtrainingmaterials%2FDMRB%2FForms%2FAllItems%2Easpx&viewid=813256e8%2D2fcc%2D4482%2Dab95%2Dbe099fc98395&id=%2Fsites%2FUpdateoftheMCHWtrainingmaterials%2FDMRB%2FAll%20templates

NOTE 4 *A template for the document development plan for MCHW is provided in SharePoint:*
https://highways.sharepoint.com/sites/UpdateoftheMCHWtrainingmaterials/MCHW/Forms/AllItems.aspx?viewid=738f5672%2D3a40%2D4f5b%2Dad53%2D3300d9c05eb5&id=%2Fsites%2FUpdateoftheMCHWtrainingmaterials%2FMCHW%2FAll%20templates

[DRAFTING NOTE: If you need access to these folders, please contact TSG.]

Drafting process

Enhanced ways of working

4.3 The development of RADs shall involve feedback loops between drafting and reviewing to ensure that the document has reached an appropriate stage and that has been subject to suitable governance.

4.3.1 The timeframe for document drafting should be as short as possible.

4.3.2 Enhanced ways of working should be adopted to streamline and improve the drafting process, particularly for documents requiring significant technical input or involvement of multiple actors.

NOTE Enhanced ways of working entail the following elements:

1. *clear definition of roles in the team working on the RAD, i.e. facilitator, technical author, authors; content specialist and peer reviewers can also be invited;*
2. *document development plan developed, agreed and reviewed as needed throughout the work;*
3. *individual commitment and accountability;*
4. *shared working time agreed within the team and planned in advance;*
5. *short team phone calls (10 minutes, possibly every day) that cover: (1) what each team member has done, (2) what their plans are, (3) anything that is blocking them to progress their work;*
6. *retrospectives every 2/3 weeks to reflect on what worked well and what can be improved in the process.*

4.4 When drafting a new RAD or reviewing an existing one, technical authors shall:

1. draft the RAD having a clear understanding of the scope of the document type under consideration;
2. use the appropriate document layout;
3. use the appropriate clause style;
4. apply the drafting principles provided in this document;
5. engage with the content specialists in a timely manner;
6. prepare the deliverables indicated in this section.

Deliverables

New draft document

4.5 At the end of the development / review process technical authors shall produce a new draft document aligned with the MDD rules using CARS as relevant.

Clause change summary

4.6 For updates to existing published documents, i.e. those drafted in CARS and published at least once, a clause change summary shall be provided to the consultees to help them understand the changes made to clauses.

NOTE 1 A new CARS functionality enables this information to be extracted in a tabular format ready to be shared with the TSC consultees, see Section 11 of MDD part 1 for further details.

NOTE 2 A clause change summary can be used for categories B, C and D changes.

Change log (for brand new MCHW documents)

4.7 Where dealing with existing MCHW documents and IANs, i.e. not drafted and published through CARS, technical authors shall produce a change log in CARS to record the changes made to the document and how requirements and advice that have been deleted provide opportunities for greater efficiency in terms of economy, productivity and effectiveness (see content of the change log in Annex 3C), and to reduce the risk of losing content.

NOTE 1 The change log is for internal use only and will not be made available externally.

NOTE 2 Change logs are used for Category A changes when an old style document is drafted and published in CARS for the first time.

NOTE 3 *The change log is not expected to provide a long description of the changes made, rather to briefly identify the type of change and the reason behind it (e.g. change of the wrong verb form, change from recommendation/permission to requirement in order to <reason>, rephrase of a prohibited expression, deletion as duplication of clause X, out of date clause, etc.), as well as the location of the clause when moved (i.e. the specific section) for easy future retrieval.*

4.8 The change log shall clearly identify the Overseeing Organisations-specific requirements, so that they can be easily extracted and passed on to the other Overseeing Organisations where needed.

4.8.1 The change log should be produced during the development process of the document and not as a separate process undertaken when the document has already been developed.

NOTE *Leaving the preparation of the change log at the end of the drafting process can increase both the time to develop the change log and the chance to lose content.*

4.9 The technical author shall consolidate the change logs developed by the other Overseeing Organisations into one single document for submission to the TSC.

Background commentary

4.10 Technical authors shall produce background commentary in CARS to record the rationale behind clauses and how changes and/or introduction of new clauses in the new document provides opportunities for greater efficiency in terms of economy, productivity and effectiveness (see content of the background document in Annex 3D).

NOTE 1 *The background document is for internal use only and will not be made available externally. The value of developing background documents resides in the opportunity to record the rationale behind clauses, thus streamlining information retrieval in the future.*

NOTE 2 *The background commentary data is included in the clause change summary and helps consultees understand why a new clause has been added or a change to a clause has been made.*

4.11 Where background to existing clauses is not known, technical authors shall record the lack of this information in the background commentary rather than trying to re-create it.

4.12 Every NAA (NDR and/or NDS in MCHW) shall have its own background commentary developed by the relevant Overseeing Organisation.

4.13 Records associated with the preparation of the document shall include normative and informative references, where not publicly available.

4.14 The primary source of the referenced document shall be cited and the reference shall, as far as possible, remain valid for the expected life of the document.

Impact assessment reports

4.15 An impact assessment report shall be produced to accompany each category A, B or C in accordance with the requirements of MDD part 1.

4.16 A commercial impact assessment report shall be produced to accompany each category A and B change in accordance with the requirements of MDD part 1.

4.16.1 A commercial impact assessment report may be produced to accompany a category C change, where considered appropriate, in accordance with the requirements of MDD part 1.

Consultation report

4.17 A consultation report shall be produced to accompany each category A, B or C change in accordance with the requirements of MDD part 1.

High-level narrative document

4.18 A high-level narrative shall be produced in accordance with the requirements of MDD part 1.

Document maintenance review report

4.19 A document review form shall be produced to accompany the review of drivers and opportunities for change completed in accordance with the document maintenance managements requirements of MDD part 1. General drafting principles

Purpose of RADs

4.20 All RADs shall define clear and unambiguous requirements in order to ensure that the Overseeing Organisations discharge their obligations.

4.21 All RADs shall reflect the needs of the Overseeing Organisations, both as a client procuring transport infrastructure assets and services and as a technical organisation developing and managing the application of good practices in partnership with industry.

Competence and skills of technical authors

4.22 Drafting of RADs shall be undertaken by technical authors who have relevant technical knowledge, experience in the specialist area and appropriate technical writing skills, and who are able to comply with the requirements of this Manual.

Primary audience

4.23 Technical authors shall write each requirement for a specific target audience.

NOTE *When writing design requirements the target audience is designers, whereas when writing construction requirements the target audience is constructors. Where design requirements address desired performances in subsequent stages of an asset life cycle, for instance design for maintenance, design for construction, design for inspection, etc., the target audience is still designers.*

4.24 The level of competence and expertise of the target audience as defined in GG 101 shall be “competent practitioners, typically qualified professionals able to work independently in relevant fields”.

NOTE *The level of competence and expertise that resides with those who draft RADs can significantly exceed the expertise of those who generally use them. Assuming a specific level of competence and expertise of the target audience helps avoid complex requirements (which can be understood primarily by experts) while reducing the amount of textbook material (generally required by less experienced practitioners).*

Balancing advisory content

4.25 Technical authors shall provide advice sufficient to support the requirements of the Overseeing Organisations.

4.26 Technical authors shall decide what advice is relevant to the document taking into account the level of competence and expertise expected from the target audience.

4.27 References to other industry guidance documents or informative appendices shall be used rather than extensive explanations in the main body of the document to raise the level of understanding of the subject by the user.

4.28 Advice shall be provided to avoid issues previously experienced by the Overseeing Organisations.

Limiting reference to or duplication of legislation

4.29 EU, UK and national legislation or statutory requirements shall be referred to or duplicated in RADs only when the Overseeing Organisations want to emphasise the supply chain's responsibility for a specific requirement.

4.29.1 RADs should not refer to or duplicate requirements provided in EU, UK and national regulations as anyone engaged in works on or relating to the Overseeing Organisations' motorway and all-purpose trunk roads is expected to understand and comply with the relevant legislation.

4.29.2 Where in doubt on legislation or statutory requirements, technical authors should consult TSG as early as possible in the development of the document.

4.29.3 When dealing with the SHW, to make sure that a particular legal requirement is complied with, evidence to demonstrate compliance should be identified and required as evidence.

NOTE Specific guidance on legislation is provided in Annex 3A.

4.30 Case law not yet incorporated into legislation shall not be treated as statutory requirements.

4.30.1 Case law not yet incorporated into legislation may be translated into Overseeing Organisations' specific requirements as relevant.

4.31 Where relevant, technical authors shall indicate within the document whether it complements, supersedes or is in addition to legislation.

NOTE 1 Specific guidance on legislation is provided in Annex 3A.

NOTE 2 In DMRB documents, the "Assumptions made" section can be an appropriate place to clarify key regulations underpinning the document under consideration.

Reducing need for departures

4.32 RADs shall be drafted such that the need for departures can be reduced where possible.

NOTE *Strategies for reducing the need for departures include: reducing prescriptions in favour of performance-based requirements; introducing tolerances / desirable and limiting values.*

Clarity

General

4.33 All RADs shall be understandable, accurate, consistent in style and format, contract-neutral, shall make appropriate reference to the Overseeing Organisations and shall be drafted to reduce the need for future review and changes.

4.34 The instructions provided in Table 1 shall be followed to enhance clarity of RADs.

4.35 The vague terms in Table 2 shall be avoided (non-exhaustive list).

Intended meaning of existing clauses

4.36 When reviewing existing documents, technical authors shall assess the intended meaning of clauses by identifying implicit requirements phrased as advice and, as a result, shall evaluate whether clauses need to be expressed as requirements or advice.

4.36.1 To guide the review process, the following three questions should be answered:

1. What does the supplier have to do?
2. What is the key technical requirement?
3. What does the Overseeing Organisation need control over (via departures)?

Independence of clauses

4.37 Technical authors shall make clauses independent by:

1. splitting sentences for better drafting and to enhance understanding;
2. avoiding linking adverbs (such as however, yet, in addition, etc.) and demonstrative pronouns (e.g. this, that, etc.);
3. repeating some words for clarity (e.g. the subject of a sentence).

NOTE *Examples of when it is appropriate to split clauses include cases where part of a paragraph is advisory and part is a requirement, or to avoid lengthy sentences with poor or insufficient punctuation that are difficult to comprehend.*

Sequence of information

4.38 Technical authors shall provide requirements in a coherent order by putting most general requirements first.

4.39 Requirements shall not contradict one another.

Conditional expressions

4.40 When dealing with conditional expressions (i.e. requirements or advice that require a specific condition to be met in order to be applied), technical authors shall use the following structure of the text: 'Where <condition is satisfied>, <requirement/recommendation/permissible approach>'

NOTE *An example of conditional expression is: 'Where the minimum polished stone value in Table 3.1 is inadequate to maintain the necessary skidding resistance, a higher polished stone value shall be specified"*

Table 1 Things to do to develop clear RADs

REQUIREMENT	COMMENTARY
UNDERSTANDABILITY	
• Write requirements understandable by the target audience and by those who have not participated in their preparation and use words that the target audience will know and understand.	
• Avoid over-emphasising what should be obvious to the target audience, but still taking account of the range of potential user skills.	
• Do not use jargon or legal terminology.	
• Do not use vague terms that may cause uncertainty and leave room for multiple interpretations.	See Table 2 for a non-exhaustive list of vague terms.
• Avoid unnecessary complexity when developing requirements and related advice.	
• Actively consider and use checklists, flow/process charts and maps to reduce complexity and enhance navigation while not repeating concepts contained in the main text.	
• Make sentences as independent as possible.	
ACCURACY	
• Make appropriate use of terms and definitions.	
• Make documents as complete as necessary within the limits defined by their scope.	
• Do not repeat information from other RADs and/or from external publications, including publicly available reports or reports that could be made publicly available, and use cross references rather than repeating text.	Where it is important to emphasise a specific warning or to repeat some important steps, limited repetitions may be made.

REQUIREMENT	COMMENTARY
• Cross reference both other RADs and external publications.	See sub-heading 'Cross-referencing' for more details.
• Provide the technical conditions that govern the applicability of the requirement to avoid reliance on tests of practicability.	
• Do not give open ended instructions, which cannot be accurately priced in advance / at time of tender.	The contractor has to have all the information to be able to price the works accurately (or at establishment of the works cost for design and build).
CONSISTENCY IN STYLE AND FORMAT	
• Make a clear distinction between requirements and advice and between different types of requirements and advice and use appropriate clause numbering system.	Clause style is given in MDD Part 2.
• Use the structure of documents provided.	Document layout is given in MDD Part 2
CONTRACTUALLY NEUTRAL	
• Support procurement processes and practices of the Overseeing Organisations, including compliance with European and national procurement legislation and other Government procurement rules.	
• Enable document usage under differing types of contracts and procurement used by the Overseeing Organisations.	
• Do not use terminology that might have alternative meanings in differing forms of contracts or which has specific associations within a specific contract type.	References to specific contracts (e.g. 'painting contract') within RADs should be avoided as RADs need to be suitable for inclusion – as part of the works information – into a wide range of contract types
• Identify the tasks to be performed or the requirements rather than referring to the method of their procurement.	An example is '*inspection firm*'.
• Do not refer to companies or suppliers.	

REQUIREMENT	COMMENTARY
• When dealing with the SHW, do not place obligation onto any party other than the contractor. Do not place obligations onto the 'designer' or sub-contractors, but rather onto the Constructor.	Requirements for third parties (sub-contractors) have to be put in terms of obligations on the Constructor because policing / enforcement of these requirements is the responsibility of the Contractor, failure to comply by the third parties will result in the Contractor being held accountable.
• Provide requirements that are contractually sound.	Any ambiguity, inconsistency or contradiction is a risk to the contract employer and resultant claims are most likely to be settled in the contractor's favour.
• Minimise statements about what to do when things go wrong.	Requirements such as "the minimum length of carriageway to be rectified shall be XX m" can be appropriate but going into any depth on requirements might limit the site team's options for contractual non-compliances. Contract non-compliances are (in NEC terms) compensation events and would therefore be governed by the conditions of contract and not the specification.
• When dealing with the MCHW, minimise the use of conditional expressions, i.e. the use of requirements that are conditional on something else happening.	It can be common to ask for method-based actions, which depend on other factors. E.g. if the ground conditions allow X then carry out X, if not then carry out Y. This type of instruction is not contractually sound and needs to be avoided.
• Do not use unnecessary text that limits the scope of the application of the requirement.	The contract defines the scope, not the DMRB or MCHW.
• Do not prescribe procedures or ascribe organisational or personnel roles, functions or responsibilities (personnel-function approach) unless imperative for the document under consideration (for example when introducing specific roles clearly defined in the document). • Focus on technical requirements, write sentences in the third person and replace personnel-function expressions with the required outcome.	Using a 'personnel-function' approach means to make reference to specific parties, for example "the designer shall assess this…" or " the contractor shall provide that…". One of the risks of using a personnel-function approach is that others in the supply chain consider they can ignore the action with obvious risks for the quality of deliverables.

REQUIREMENT	COMMENTARY
	Example of change of a personnel function expression: “the designer should consider the deck edge design with respect to …” can be replaced by “the deck edge shall be designed to ensure…”. Avoiding a personnel-function approach enables RADs to be contract-neutral and provide freedom to define roles and responsibilities in the contract phase. The only parties to the contract are the employer and the contractor. There is no contractual link between the employer/client and any of the contractor’s sub-contractors. Wording that prescribes procedures or ascribe organisational or personnel roles, functions or responsibilities to supply chain members can lead to disputes between supply chain parties over who has responsibility for executing certain actions when the overall responsibility rests with the organisation contracted to the Overseeing Organisation to deliver the product or service. Prescribing roles and responsibilities can lead to the effect of returning risks to the Overseeing Organisation that the contract assigns to the supply chain. The treatment of risk can be very different depending on the procurement method selected. For example, in Design, Build, Finance and Operate (DBFO) contracts a significant proportion of the risk associated with the design and construction work, as well as future maintenance, is transferred to the DBFO Co.
• Do not tell the contractor how to do the work. Instead, instruct what the outcomes should be and leave the contractor to decide how to get to those outcomes.	
REFERENCING APPROPRIATELY THE OVERSEEING ORGANISATIONS	

REQUIREMENT	COMMENTARY
• Do not include narrative or undertakings, as well as placing any obligation or risks on the Overseeing Organisation, which could impede the progress of the works or be interpreted as a breach of contract in the event of non-delivery of the requirement.	Example of undertakings: “The Overseeing Organisation does this…”, “The Overseeing Organisation shall do this…”, “xxx shall happen…”. If the Overseeing Organisation fails to do anything contained in an undertaking within a RAD, it will be in breach of any contract which has adopted the RAD and subject to claims.
• Do not describe the Overseeing Organisation’s internal processes or procedures, tasks or obligations (see Note 1), unless there is an imperative need and provided that this is discussed and agreed with TSG.	Overseeing Organisation’s internal processes or procedures are not relevant to the supply chain and are likely to be considered contractual obligations. Failure on the part of the Overseeing Organisation to then deliver on obligations included in a document could result in the Overseeing Organisation being in breach of the contract, leaving it open to claims.

REQUIREMENT	COMMENTARY
HEALTH AND SAFETY MATTERS	
• Do not transfer health and safety liability onto the Overseeing Organisation. • Do not tell the contractor how to undertake the works from a health and safety perspective or give the contractor health and safety advice. • Leave the contractor to establish their own safe systems of work. • In particular cases, to make sure a particular health and safety issue is dealt with by the contractor, ask for evidence to demonstrate what they are doing rather than telling them what to do. • Do not use the term or abbreviation “as low as is reasonably practicable” (ALARP) in requirements and advice documents.	The contractor is responsible for the health and safety of his employees and the employees of his sub-contractors. Use the term or abbreviation “so far is reasonably practicable” or “SFAIRP” where you would have used “ALARP”. ALARP and SFAIRP terms have similar meaning and at their core is the concept of ‘reasonably practicable’; this involves weighing a risk against the trouble, time and money needed to control it. However, when considering what is reasonably practicable SFAIRP requires the user to consider why shouldn’t a control measure be applied, rather than why should it, the emphasis therefore being upon the default application of reasonably practicable measures.
REDUCED NEED FOR REVIEW AND CHANGE	
• Draft RADs such that, barring any major technical innovations, future reviews are a straightforward process as possible.	
• Minimise or avoid reference to documents or specific information that might be subject to change over time in order to reduce the amount of work during subsequent reviews.	This means (i) to avoid references to specific agencies/organisations and to specific contact names, telephone numbers and email addresses, and (ii) to minimise/avoid references to the specific date

REQUIREMENT	COMMENTARY
	of publication of a document that is referred to and reference to specific clauses (see Cross Referencing below).
• Draft RADs to be as policy, process and function neutral as possible to minimise the need for change as policies and processes change.	
Note 1 See Section 7 to produce a document containing process requirements and procedures for internal use by the Overseeing Organisations.	

Table 2 Non-exhaustive list of vague terms to avoid

Things to avoid	Description	Examples of expressions to avoid	Suggested approach
Qualitative and subjective terms	These indicate that what is required is either defined elsewhere or that the requirement is open to subjective interpretation. Subjective terms can be problematic when the way the test is to be applied in the field is not defined.	• *Adequate* • *As appropriate* • *As soon as possible* • *Practicable / Reasonably practical* (1)	Delete and rephrase where relevant. Provide the technical conditions that govern the applicability of the requirement.
Aspirational terms		• *Ideally* • *It is hoped that*	Delete and rephrase where relevant.
Expressions which do not explain what outcome is expected	These can be difficult to evaluate.	• *Specialised advice should be sought*	Clarify the expected outcome. Example: *"Where criteria in Table X indicate 'very aggressive' conditions, specialised advice should be sought"* → *"Where criteria in Table X indicate 'very aggressive' conditions, measures to mitigate those conditions shall be put in place and recorded in (…)"*
Terms which define a hierarchy of requirements	These include adverbs or other qualifying terms. Hierarchy of requirements can prove difficult to defend in the future in the event of an incident.	• *More important than* • *More relevant than*	Delete and rephrase where relevant.
Terms used in conjunction with lists for expanding advice		• *But not limited to* • *As a minimum*	Delete and rephrase where relevant.

Things to avoid	Description	Examples of expressions to avoid	Suggested approach
Expressions that are difficult to price or which put obligations on the Overseeing Organisations		• *To the satisfaction of the Overseeing Organisation* • *Subject to the approval of the Overseeing Organisation* • *Submitted to the Overseeing Organisation for acceptance* • *As directed by the Overseeing Organisation* • *Agreement with the Overseeing Organisation*	Give acceptance criteria or outcomes against which solutions / proposals can be judged to avoid the Overseeing Organisation deciding what is acceptable.
Contractually ambiguous expressions	These do not enable the Overseeing Organisations to verify whether a requirement or a specific recommendation has been followed.	• *Care must/shall/should be taken* • *Account must/shall/should be taken* • *Attention must/shall/should be taken* • *Consideration must/shall/should be given* • *Preference must/shall/should be given* • *Careful judgment is required* • *It must/shall/should be considered* • *When required* • *Should have regard to* • *Likely to be justified* • *Must/Shall/should ensure*	Rephrase the sentence using the appropriate verb forms for requirements and advice. Examples: "*When designing a gantry, consideration shall be given to the wind actions*" → "A *gantry shall withstand wind actions*". "*Care shall be taken to apply the correct partial factors for actions*" → "*Partial factors for actions shall be taken from the NA to BS EN 1990 for relevant limit states*". "*Dealing with these problems requires careful judgment and a contingency plan should always be developed in advance*" → "*A contingency plan shall be developed to avoid* [specific problem]"

Things to avoid	Description	Examples of expressions to avoid	Suggested approach
			"*The designer shall consider whether to allow in the design for the likely future repositioning of equipment or signage on the gantry*" → "*Gantries should be designed to allow for future repositioning of equipment or signage*". "*(…) should ensure that the application of the DMRB to local works does not increase (…)*" → "*(…) should assess that the application of the DMRB* (…)"
Expressions that say what the compiler should have done rather than what the contractor should be doing		• *The works are detailed in the works appendix'*	The work shall be carried out in compliance with the works appendix
Expressions that are requirements by stealth		• *needs*	Acknowledge that this is a requirement and write accordingly.
Note 1 Subjective terms such as *likely*, *practicable*, *reasonably practical* can be used in the context of risk assessment and management.			

Cross-referencing

4.41 Hyperlinks shall not be used.

NOTE: Not only are hyperlinks ineffective on paper documents, but domains can be bought, sold, abandoned and hijacked, and can potentially not link to the intended information.

Cross referencing specific clauses

4.42 Cross referencing specific clauses contained in a RAD shall be avoided unless imperative.

4.42.1 Cross referencing a section in a RAD should be made where relevant.

4.43 Cross referencing specific clauses contained in other RADs, external regulations, standards developed by others, and external guidance documents shall be avoided unless imperative.

4.44 Where there are references to specific clauses contained in other RADs, regulations, standards developed by others, and external guidance documents, the document reference, year and/or version number (where relevant) shall be given.

Cross referencing regulations

4.45 References to legislation or statutory requirements shall be made by quoting the official title of the document, e.g. Construction (Design and Management) Regulations.

4.45.1 The examples of references to regulation given below should be used:

1. “must fulfil the requirements given in [Regulation title]”
2. “must fulfil the requirements provided by [Regulation title]”
3. “must comply with [Regulation title]”
4. “must (…) in accordance with [Regulation title]”
5. “must (…) according to [Regulation title]”

Cross referencing standards developed by others

4.46 References to standards developed by others shall be made by quoting the official number of the standard (along with the year of issue when reference is made to a specific clause) in the main text and the title in the Normative or Informative references sections as relevant.

4.46.1 Technical authors should establish a list of BSI references and make full use of the online facility to track changes to these documents as part of their management of the document.

4.47 Technical authors shall make reference to external standards by using the verb form appropriate to requirements or advice.

4.47.1 Where a requirement is provided by referencing to an external standard, the examples given below should be used:

1. “shall fulfil the requirements given in [Standard number]”

2. “shall fulfil the requirements provided by [Standard number]”
3. “shall comply with [Standard number]”
4. “shall (…) in accordance with [Standard number]”
5. “shall (…) according to [Standard number]”

4.47.2 Where advice is provided by referencing to an external standard, the examples given below should be used:

1. “should/may (…) given in [Standard number]”
2. “should/may (…) provided by [Standard number]”
3. “should/may (…) comply with [Standard number]”
4. “should/may (…) in accordance with [Standard number]”

4.48 Where relevant, technical authors shall indicate within the document whether it complements, supersedes or is in addition to European Standards, International Standards, EADs and Codes of Practice, and BSI Standards.

4.49 Where requirements additional to those provided by external standards such as hENs, BSs, ISOs, etc. are needed, a check shall be made that EU procurement and product legislation do not prohibit such requirements.

Cross referencing with external guidance documents

4.50 Technical authors shall assess the opportunity to make reference to external guidance documents.

4.50.1 Technical authors should choose external guidance documents developed by reputable trade organisations and professional institutions.

NOTE *Referring to external guidance documents has risks to be addressed before following this route and it does not absolve the Overseeing Organisation from ensuring that the RAD fully and accurately sets out their requirements, a key risk being in structure and level of prescription of the guidance documents.*

4.51 Where relevant, technical authors shall indicate within the document whether it complements, supersedes or is in addition to advice developed by trade associations (e.g. CIRIA), institutes (e.g. Institute of Electrical and Electronics Engineers IEEE), other government bodies (e.g. Environment Agency, English Heritage, Scottish Nature etc.)

Cross referencing between DMRB and MCHW documents

4.52 All references shall give details of where users can find the referenced document, unless it is part of an established and publicly available document set, e.g. BS, BS ENs, ISOs, DMRB, MCHW.

4.53 Where they are used, publicly available reports or reports that could be made publicly available shall be quoted and referenced via use of Normative and Informative references.

4.54 References to standards, DMRB documents or MCHW documents shall be introduced in the text with the document code as the identifier, followed the reference citation, e.g. CS 454 [Ref 1.N].

NOTE: CARS automatically generates the reference citation when the reference library is used to search for and insert the reference to the document.

4.54.1 For other types of reference, the reference may be introduced with the reference citation without any identifier, e.g.: “Background to method Y can be found in [Ref 2.I]”.

4.55 Reference listings shall include all of the following:

1. the title of the document;
2. the location of the document (e.g. document set, journal, volume, page numbers etc);
3. the publisher of the document.

4.56 Where needed to identify the document, the reference shall include other details to identify, locate and obtain the document, which may include:

1. identifier (e.g. the document code)
2. author (not required for standards, DMRB documents or MCHW documents); date (not required for current versions of standards, DMRB documents or MCHW documents)

NOTE: Table 3 includes examples for referencing various types of document.

4.57 References to the latest version of a standard, DMRB document or MCHW document shall not include the year or version number, except where a specific (numbered) clause is being referenced.

4.57.1 Where cross referring is made to other DMRB or MCHW documents, the examples of references given below should be used:

1. “in accordance with [Document code]”
2. “according to [Document code]”
3. “details as given in [Document code]”
4. “the requirements given in [Document code]”

4.58 Where relevant, technical authors shall indicate within the document whether it complements, supersedes or is in addition to other Overseeing Organisation documents.

4.59 References to specific versions of withdrawn documents shall include the year or the version number.

4.59.1 References to withdrawn documents should be avoided, unless necessary to provide explanation of provenance in a note or in the Background section.

Table 3 Guidance on referencing documents, with examples

	Title	Author	Location and publisher	Identifier
Referencing the latest version of a DMRB document	[Title of the document]	[Leave blank]	[DMRB, National Highways]	[Document code without the year or version number]
	Assessment of highway bridges and structures		*DMRB,* National Highways	*CS 454*
Referencing a specific version of a DMRB document (e.g. when referencing a withdrawn version to explain provenance in a note, or in exceptional cases when it is necessary to reference a specific numbered clause of a document)	[Title of the document]	[Leave blank]	[DMRB, National Highways]	[Document code, including the year or version number]
	The assessment of highway bridges and structures		*DMRB,* National Highways	*BD 21/01*
Referencing the latest version of a third-party standard or similar document	[Title of the document]	[Leave blank]	[Publisher of the document]	[Document code]
	Eurocode 1. Actions on structures. Traffic loads on bridges		*BSI*	*BS EN 1991-2*
Referencing a specific version of a third-party standard or similar document (e.g. a withdrawn document)	[Title of the document]	[Leave blank]	[Publisher of the document]	Short reference of the document
	Code of practice for earth retaining structures		*BSI*	*BS 8002 (2001)*
Referencing a technical article in a journal	[Title of the article]	[Author of the specific article being referenced]	[Details of the journal, e.g. Title of journal, volume/issue number, page numbers of the article, publisher, month/year of issue etc.]	[Leave blank]
	Application of the mechanism analysis to masonry arches	*Harvey, W.J.*	*The Structural Engineer, Vol 66, No. 5, p77, March 1988*	

Reference to Overseeing Organisation's internal documentation

4.60 Reference to documents only held on the Overseeing Organisation's internal or limited access systems should be avoided, unless information is provided to enable the primary users of the document to locate and obtain the document being referenced.

NOTE: Overseeing Organisation's internal documents can also need to be notified to the EC, as the legislation refers to "any administrative provision".

Unpublished documents

4.61 Unpublished documents and/or references which have not been subject to peer review shall not be used.

Use of '*as specified in*'

4.62 Technical authors shall use the expression "as specified in" only when cross referencing content in the MCHW.

5. Develop new RADs

5.1 Technical authors shall produce a new RAD only when doing nothing would have significant adverse implications and it is not possible to:

1. produce an implementation RAD to an existing standard beyond the Overseeing Organisations' document sets;
2. revise and update an existing document;
3. transfer responsibility for development of best-practice guidance to industry.

NOTE 1 Situations where a new RAD can be appropriate include:

1. *New technical innovation.*
2. *New technology.*
3. *New legislation.*
4. *New operational practice*
5. *New or revised policy.*

5.2 New requirements shall be translated into requirements and advice in the appropriate technical documents.

NOTE 2 Generally, new requirements are initially given in overarching technical or policy documents that are unsuitable for transmitting to the supply chain.

5.3 When developing a new RAD, the subject matter shall be carefully assessed to identify the appropriate location(s) within the Overseeing Organisation's document sets (see Section 5 to MDD Part 1).

DMRB

Maintenance requirements in DMRB documents

5.4 Where technical authors intend to introduce maintenance requirements in a new DMRB document, they shall contact the Asset Management Group, to avoid duplication or contrasting requirements between different document sets.

Nationally determined content [NAAs for DMRB and NDRs for MCHW]

General principles

5.5 Material that is specific to an Overseeing Organisation and not applicable to all of them shall be provided in a National Application Annex for DMRB and National Determined Requirements/Sections for MCHW.

NOTE Details on the scope of the National Application Annexes are presented in Section 5 to MDD Part 1.

5.6 Technical authors shall engage with the other Overseeing Organisations to discuss the strategies to deal with their own specific requirements as early as possible to explore opportunities to harmonise requirements across different countries, discuss relevance and feasibility of NAAs/NDRs/NDS production, agree their publication, or discuss about timescales when deciding to postpone their publication.

5.7 Each Overseeing Organisation shall be responsible for developing its own National Application Annex (DMRB) / Nationally Determined Requirements/Section (MCHW).

5.8 Technical authors shall indicate material that is specific to an Overseeing Organisation and not applicable to all of them (including content of IANs) into the change log (see 'Deliverables').

NOTE Highlighting content specific to the Overseeing Organisations into the change log will assist in the development of NAAs/NDRs/NDS by all Overseeing Organisations.

Managing interest of one Overseeing Organisation vs three Overseeing Organisations (DMRB only)

5.9 Where the content of a DMRB document applies to one Overseeing Organisation only:

1. such content shall be presented into the NAA of the Overseeing Organisation under consideration;

2. the following fixed text shall be provided in the core DMRB document;

   *"There are no United Kingdom wide requirements and the national requirements for [**topic**] set out in the National Application Annexes shall be followed."*

3. the remaining NAAs shall contain the following fixed text on the front page:

   "The requirements of *[**code of the DMRB document**] do not apply in [**country under consideration**]";*

4. A new section shall be added to the National Application Annex where the requirements do not apply titled 'Applicability';

5. A single requirement shall be added to the Applicability section with the text;

   "The requirements of *[**code of the DMRB document**] shall not apply in [**country under consideration**]".*

5.10 Where three of the four Overseeing Organisations agree on the content of a DMRB document:

1. such content shall be kept into the core DMRB text;
2. the fourth Overseeing Organisation shall either develop their NAA with relevant content or communicate their intention to include a holding statement (see "Postponing publication of NAAs").

NAAs with no specific requirements

5.11 Where no NAA is needed, only the core DMRB document shall be published.

5.12 Where at least one NAA is developed and there are United Kingdom wide requirements in the core document, the remaining NAAs without requirements shall contain the following fixed text on the title page:

"*There are no specific requirements for [***Overseeing Organisation under consideration**] *supplementary or alternative to those given in* [**code of document**]".

NOTE *Introducing a NAA with no specific requirements helps users better understand the status of the DMRB document for each Overseeing Organisation.*

Postponing publication of NAAs

5.13 Where the Overseeing Organisation has formally agreed to postpone the publication of the NAA after publication of the core DMRB document, the NAA shall only contain the following "holding statement" in the summary of the document information page on CARS:

"Please contact [**Overseeing Organisation**] *for the application of* [**DMRB document code**]*. The email address is:* [**email address**]*."*

5.13.1 A holding statement should be introduced only in exceptional circumstances.

H&S requirements

5.14 Where there are risks to health and safety, Safety Alerts or Safety Instructions shall be issued as relevant (see Section 5 to MDD Part 1).

Produce an implementation RAD to an existing standard beyond the Overseeing Organisations' document sets

5.15 Where an existing standard beyond the Overseeing Organisations' document sets meets the needs of the new identified requirement and is compatible with the Overseeing Organisation's obligations under EU, UK and national legislation, an implementation RAD shall be produced in order to disseminate the requirement to the supply chain.

5.15.1 A tabular form should be used to present implementation RADs, an example is provided in Table 4.

Table 4 Example of table for implementation RADs

Clause in <standard under consideration>	**Subject** (as needed)	**Amendment**	**Item** **<if needed, e.g. to identify specific amendments where there are multiple amendments to a single clause>**
Number of the specific clause / section in the standard under consideration	Title of the clause	Type of amendment presented in italics and followed by the requirement / advice / note	This contains the number of the item, e.g. 1, 2 etc., which is needed to identify the row in the table for the purpose of the DMRB / MCHW document.

5.16 Technical authors shall contact TSG to discuss options to present implementation RADs at standards_enquiries@nationalhighways.co.uk.

NOTE *The general principle is that implementation RADs have to be MDD compliant as well as easy to use.*

5.17 Where the technical author verifies that the existing standard beyond the Overseeing Organisations' document sets referred to in the implementation RAD can fall out of common use or requires amendment to keep up with industry practice, the options for communicating requirements shall be reviewed.

6. Update existing RADs (MCHW or DMRB)

General

6.1 Technical authors shall revise an existing document where it is practical to amend it to meet the new requirements.

NOTE *Situations where revision of an existing RAD can be appropriate include:*

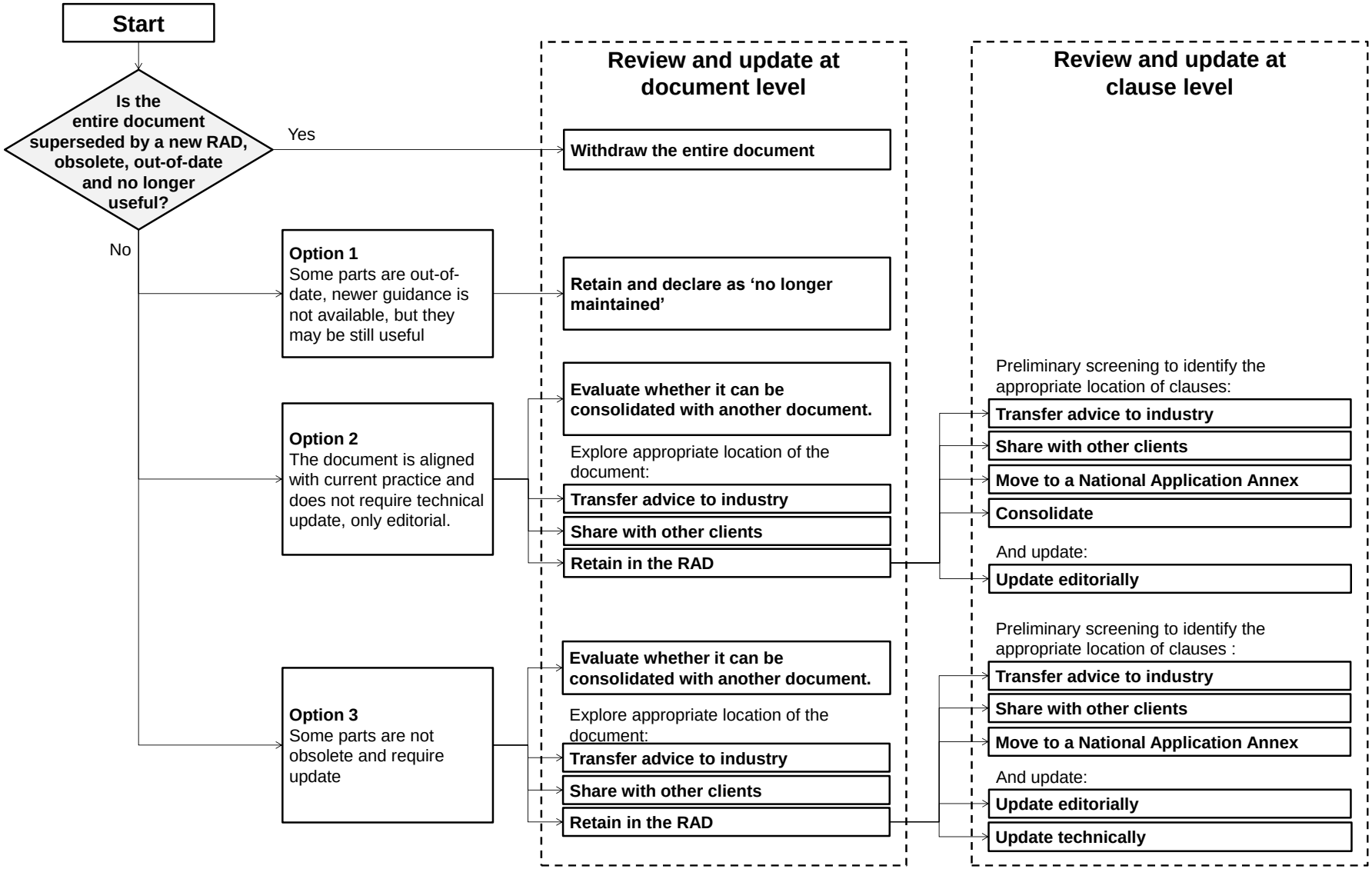
1. *further advances to an existing technical solution;*
2. *further developments to existing technology;*
3. *amendments to existing legislation;*
4. *revisions to normative and informative references;*
5. *revised operational practice;*
6. *taking forward industry feedback on existing documents.*

6.2 The revision and update of RADs shall be carried out at document level and clause level (see steps in Figure 1).

6.3 At clause level, technical authors shall carry out:

1. preliminary screening of the text;
2. technical correction and update;
3. editorial updates.

Figure 1. Review at document and clause level



Preliminary screening

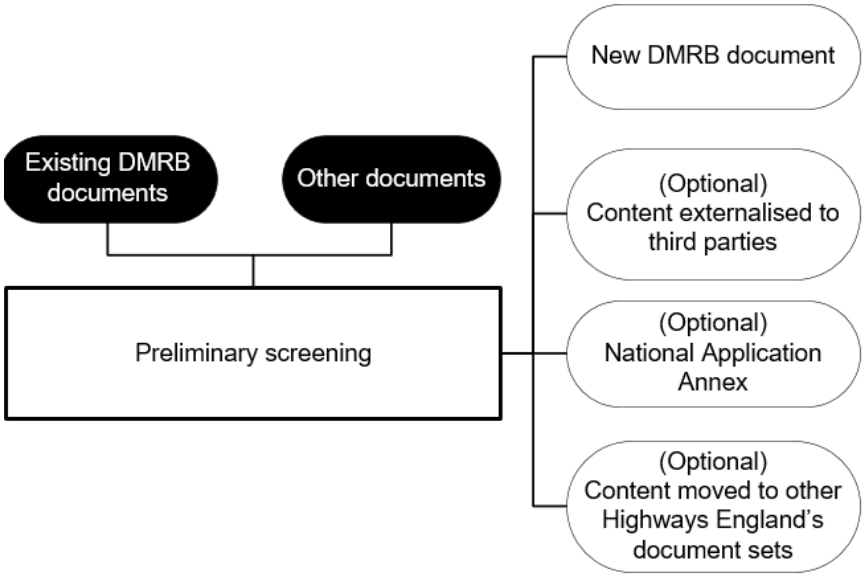
6.4 At the start of the review process technical authors shall carry out a preliminary screening to support rationalisation of the content, identify the most appropriate location of the content and minimise the risk of losing it.

6.5 During preliminary screening, technical authors shall assess:

1. opportunities to move specific clauses either to other parts of the same document, or to other documents in the National Highways' suite to enhance navigation and accessibility of information;
2. opportunities to reduce advice where not relevant, either by deleting it or by transferring responsibility for its development to third parties;
3. opportunities for sharing requirements with other asset owners;
4. need to move content into a National Application Annex (DMRB only) or Nationally Determined Requirement (MCHW).

NOTE *Figure 2 provides the key activities of the preliminary screening of DMRB documents.*

Figure 2. Preliminary screening of DMRB documents



Technical corrections

6.6 Technical corrections shall include:

1. review and update of out-of-date content,
2. review and update of references to other Overseeing Organisations' document sets,
3. review and update of references to external standards or external best practice.

Editorial updates

6.7 Editorial updates shall include:

1. review and update of layout;
2. review and update of the style of basic elements;
3. review and update of the style of documents, with a specific focus on making a clear distinction between different types of requirements and advice using the appropriate verb forms.

Specific rules for DMRB & MCHW documents

Transition from current to new DMRB & MCHW documents

6.8 Group Managers shall ensure that, at any moment of time, a compatible and non-contradictory set of documents including a combination of existing and new DMRB & MCHW documents in their subject area is available to the supply chain.

6.9 Parts of existing DMRB & MCHW documents that are incompatible with the new documents shall be withdrawn.

6.9.1 Packages of compatible new DMRB & MCHW documents should be published together.

Transition from current Volume 3 drawings to figures

6.10 Technical authors shall review all drawings within MCHW Volume 3, with the purpose of Volume 3 no longer being part of the MCHW.

NOTE *It is intended that all Volume 3 drawings will be archived and not updated, although they will be made available on the Standards for Highways website for legacy works, existing contracts, future maintenance contracts, or schemes that require them.*

6.11 Technical authors shall assess whether the information provided on the drawings in MCHW Volume 3 is still needed or still valid and, if so, whether it is relevant to designers or constructors.

6.12 Drawings within Volume 3 shall become figures relating to design or constructor requirements and moved to the appropriate location within the DMRB and SHW (see location of content below).

NOTE *For rules on figures, see MDD Part 2, section 9.*

6.13 A figure shall never be used in isolation to convey requirements or advice.

NOTE *A departure is always be against the originating requirement (shall) and a justification is provided for deviation from a recommendation (should); never against the figure.*

Location of content

6.14 Elements of Volume 3 drawings shall be moved to the DMRB where the content is better suited to inform design decisions.

6.15 Where moving drawings to the DMRB, Volume 3 drawings shall be updated and presented as figures in the main text or in an appendix as appropriate.

6.16 Elements of Volume 3 drawings shall be moved to the SHW where the content is better suited to informing the constructor regarding the construction of the works.

6.17 Where moving drawings to the MCHW, Volume 3 drawings shall be updated and presented as figures in the main text.

Governance of figures

6.18 Figures shall be treated with the same level of governance as any other element of the document, due to their effects on the interpretation and comprehension of any associated requirements and advice.

Maintenance requirements in DMRB & MCHW documents

6.19 Technical authors updating DMRB & MCHW documents shall contact the Asset Management Development Group, when dealing with maintenance requirements to avoid duplication or contrasting requirements between different document sets.

Construction & Design requirements in DMRB & MCHW documents

6.20 Construction requirements currently contained in the DMRB shall be moved to the relevant MCHW document(s).

6.21 Design requirements currently contained in the MCHW shall be moved to the relevant DMRB document(s).

6.22 Construction and design requirements shall be extracted, re-drafted where needed, and detailed in the document development plan ready to be issued to the same TSC.

NOTE *Developing MCHW clauses along with related DMRB clauses enables documents to be reviewed at a single TSC, thus reducing the need for a separate TSC meeting and mitigating the risk of delays in the notification process.*

6.23 When rewriting the MCHW, technical authors shall evaluate whether there is a need for maintaining design for construction requirements in the DMRB.

6.24 Where a change in the MCHW is necessary at the same time as the updated DMRB document is published, the DMRB document shall be held back until such time as the MCHW is updated.

6.25 Where a change in the DMRB is necessary at the same time as the updated MCHW document is published, the MCHW document shall be held back until such time as the DMRB is updated.

Asset data information and management requirements in DMRB documents

6.26 Asset data information and management requirements related to National Highways shall be referenced in the Asset Data Management Manual (ADMM).

NOTE *The ADMM sets out National Highways' asset data requirements to achieve both its corporate and asset management objectives.*

6.27 Any existing asset data information and management requirements related to National Highways shall be migrated from DMRB and MCHW documents to the Asset Data Management Manual (ADMM).

NOTE *Further guidance is available from the ADMM custodian at AIG_ADMM@highwaysengland.co.uk*

6.28 Technical authors shall identify the cross-references between DMRB (or MCHW), related England NAA and ADMM, and ensure that they are up to date and support the point being made within the ADMM.

6.29 Technical authors shall notify the ADMM custodian of any issues with references within the ADMM and any relevant corrections to be made to the ADMM.

6.30 Any existing asset data information and management requirements related to the other Overseeing Organisations shall be migrated to their own NAAs or relevant asset data management systems as appropriate.

Produce a document containing process requirements and procedures for internal use by the Overseeing Organisations

6.31 Overseeing Organisation's requirements shall be removed from the DMRB and MCHW documents and, where necessary to support internal staff, provided into a separate document setting out process requirements and procedures for internal use only.

6.31.1 Where the process undertaken by the Overseeing Organisation is mandated in legislation, this may be included within the DMRB or MCHW document subject to prior discussion and agreement with TSG

NOTE *Internal processes or procedures are not relevant to the supply chain and likely to be considered contractual obligations.*

6.32 For National Highways:

1. the process documents for internal use only shall be developed by the technical authors as a CHE Memo;
2. the CHE memo shall be published at the same time as the DMRB document;
3. the other Overseeing Organisations shall be advised of the action taken.

NOTE *The internal procedure can potentially be shared with the other Overseeing Organisations so they can use this in their own organisations as appropriate.*

6.33 The Overseeing Organisations shall apply their own governance processes to disseminate the process requirements internally.

6.34 Technical authors shall reword existing DMRB or MCHW related to process requirements and procedures of the Overseeing Organisations to make them relevant to the supply chain.

NOTE *An example is:*

Current text: "The Overseeing Organisation shall approve the proposed road safety audit team before the road safety audit is undertaken".

Modified text: "Details of the proposed road safety audit team shall be submitted for approval to the Overseeing Organisation before the road safety audit is undertaken".

Relaxations

6.35 Relaxations contained in DMRB documents shall be redrafted as preferred options (i.e. 'should' clauses) to a relevant requirement.

NOTE 1 An example is:

2.1 For existing motorways, the derived merge layout shall satisfy one of the following options:

1. Option 1: (……)
2. Option 2: (……)
3. Option 3: (……)

2.1.1 Option 1 should be applied.

NOTE 2 The designer can then adopt other options, or in other words deviate from the recommendation given, provided that a justification is recorded following the rules given in GG 101.

6.36 The term 'relaxation' shall not be used as no longer needed.

NOTE Relaxations become effectively recommendations to requirements listing multiple options.

7. Transfer responsibility for development of best-practice guidance to industry ('transfer to industry' option)

7.1 In the 'transfer to industry' option the requirements shall remain in the Overseeing Organisation's documents, but the advice could pass to industry.

NOTE *In this context the term "industry" indicates external publishers, trade/industry bodies and professional bodies.*

Assessment

7.2 When revising a document or specific clauses, technical authors shall assess the benefits, risks and feasibility of transferring the document or specific best-practice guidance to external publishers, trade or industry bodies, and professional bodies.

NOTE 1 *Transferring advice to industry has risks to be addressed before following this route and it does not absolve the Overseeing Organisation from ensuring that the RAD fully and accurately sets out their requirements.*

NOTE 2 *The structure and level of prescription of industry documents can present challenges for reference of such documents by RADs: the mix of design and specification requirements together with advice in some industry documents can prove difficult to refer to without complex implementation instructions.*

NOTE 3 *The level of prescription in industry documents can lead to excessive transfer of risk to the Overseeing Organisation and raise issues concerning compliance with EU product and procurement legislation, thereby making it inappropriate for RADs to refer to them.*

NOTE 4 *Potential issues when transferring advice to industry include:*

1. *limited control over the document;*
2. *variable/longer time for publication of standards by other organisations;*
3. *conflict of interest due to the promotion of specific products or solutions;*
4. *inconsistencies when splitting off sections from the DMRB;*
5. *structure and level of prescription of industry documents.*

NOTE 5 *Potential issues for users when transferring advice to industry include:*

1. *longer time to find information, which will be scattered across multiple documents,*
2. *additional costs for subscription to access*

7.3 The 'transfer to industry' option shall apply where the group responsible for the original proposal recognise that:

1. it is more practical to allow industry to manage the identified need itself using its experience and expertise, rather than developing or revising RADs;
2. this option provides the more efficient route to implementation or adoption;
3. the document proposed is compatible with the Overseeing Organisation's obligations under EU, UK and national legislation.

7.4 The 'transfer to industry' option shall apply when the section of the industry that is likely to be responsible for the document has a well-developed trade association or professional body that has in place the necessary governance arrangements to develop a document suitable for use by the Overseeing Organisation and that may be referred to in RADs.

NOTE *The type of area where the 'transfer to industry' option would be appropriate is where the Overseeing Organisation currently has much guidance but few requirements. Transferring advice to industry can be relevant to eliminate advisory content (particularly best practice), which is a key recommendation for the future DMRB.*

Obligations on the Overseeing Organisation

7.5 The obligations and constraints placed on the Overseeing Organisation shall be communicated to the industry bodies drafting the document to be referred to in RADs as part of any engagement process.

NOTE *Failure of the industry documents to meet the standard required for disseminating requirements of the Overseeing Organisation render the documents developed unsuitable for use.*

Availability

7.6 Any advice documents produced by industry or the supply chain following the 'transfer to industry' option shall:

1. be included as an informative reference within the RAD;
2. be publicly available and ideally free to obtain;
3. not be given a RAD reference number, nor shall they be formally endorsed by the Overseeing Organisation.

8. Develop collaboratively with other infrastructure clients

8.1 Technical authors shall identify situations where documents or specific requirements can be developed through collaborative work with other infrastructure clients or providers.

NOTE 1 Advantages of sharing documents or requirements with other infrastructure clients include:

1. *to pool resources and share the cost of developing documents;*
2. *to help reduce the variation in client requirements, increase efficiency for suppliers, enhance leverage of R&D and better enable transfer of solutions from other sectors (see also the report of the Industry Standards Group[1]);*
3. *the document can be more widely accepted and used in the industry if suppliers are joint stakeholders in its development.*

NOTE 2 Potential issues arising from the development of shared documents or requirements include:

1. *need to understand areas where sharing documents may be beneficial first (potentially relevant only to a limited range of disciplines);*
2. *limited control on the process;*
3. *difficult to achieve consensus among stakeholders involved;*
4. *difficult to implement due to the huge amount of resources required;*
5. *longer time to develop documents;*
6. *limited control on the document produced;*
7. *need to identify the over-riding owner of the document;*
8. *potential increase in complexity of documents.*

[1] https://www.ice.org.uk/disciplines-and-resources/best-practice/specifying-successful-standards

9. Present research outcomes

9.1 Technical authors shall contact TSG to discuss further on options to retain research outcomes at standards_enquiries@nationalhighways.co.uk.

NOTE *Some documents provide useful research outcomes or guidance material (e.g. H&S IANs). These can be either translated into research reports / stand-alone advisory material which will sit outside the main document suites or can be provided into appendices (informative only).*

10. Withdraw RADs

Withdraw and replace one document with a new version

10.1 If an existing RAD is to be superseded by a new RAD, the existing document shall be withdrawn.

10.2 For a document that is withdrawn and superseded by another document (of the same type, a different type within the same series or a different series), the withdrawal is implicit in the CHE sign off at publication stage.

10.3 The technical author shall prepare a justification for the deletion of the document, as well as a communications proposal for informing the supply chain, for consideration by each of the Chief Highways Engineers (National Highways and the other Overseeing Organisations), before the document is approved for withdrawal.

10.4 TSG shall be approached for guidance on the withdrawal of documents.

Withdraw and replace multiple documents with consolidated versions

10.5 When revising an existing document, technical authors shall assess the benefits, risks and feasibility of consolidating it with other relevant documents or replacing them with different documents.

NOTE 1 Consolidating documents fits with the Overseeing Organisation's objective of reducing the number of documents and can be necessary to enhance navigation and accessibility of content, as well as to support the new structure of the DMRB and MCHW.

NOTE 2 Consolidating documents can be relevant to documents with less than 15 pages and whose requirements are shared by a limited number of documents.

Withdraw and not replace

10.6 The technical author shall prepare a justification for the deletion of the document, as well as a communications proposal for informing internal staff and the supply chain, for consideration by each of the Chief Highways Engineers (National Highways and the other Overseeing Organisations) before the document is approved for withdrawal.

10.7 For National Highways, the communications proposal for informing the supply chain may include a CHE memo, subject to agreement with TSG.

10.8 Where a CHE memo is determined appropriate, an accompanying letter to the supply chain should be drafted for all withdrawals that are immediate.

NOTE Withdrawals related to a graceful fade away of documents no longer implemented in new contracts do not require a letter to the supply chain and only require a CHE memo.

11. Performance-based requirements

11.1 Performance requirements apply to both DMRB and MCHW documents.

11.2 Technical authors shall seek to reduce the number of method-based requirements and increase the number of performance-based requirements.

NOTE 1 Details on the distinction between method-based requirements and performance-based requirements are provided in Annex 3B.

NOTE 2 Details on the distinction between constructed facilities and manufacturing products and on the different approach for developing performance-based requirements are provided in Annex 3B.

Performance-based requirements for products

General considerations

11.3 Requirements for products shall, wherever possible, be set out as performance criteria in compliance with the *Technical Standards Strategy* published in July 2012 (or any subsequent update), which states that:

"A performance based approach to requirements shall be adopted across all our requirements, where appropriate, to allow more freedom for designers and suppliers to apply innovative thinking and allow increased design flexibility.

Where the introduction of performance criteria requires new measures of performance to be developed, technical authors shall be encouraged to consider commissioning the research necessary to develop such measures."

NOTE 1 Implementation of Government policy, European Union (EU) product legislation and European procurement legislation require all product specifications to be performance-based and ideally outcome-based.

NOTE 2 A product can be a report or general data as well as a physical product of highway infrastructure.

NOTE 3 A performance-based approach helps minimise the need for departures, encourage innovation by the supply chain and transfer risk to the supply chain.

11.4 Where the product is a report, the acceptance criteria for the report shall be included as requirements and the outcome required from the report given, rather than just giving a structure and guidance on content.

11.5 Where it is not possible to express a requirement in performance terms (normally because the appropriate performance measures have not yet been developed) technical authors shall keep records of every instance where this is the case (i.e. where a method requirement has been used instead of a performance requirement) and the reasons for doing so.

NOTE This record will assist the Technical Standards Committee and future reviews of the document.

11.6 Technical authors shall state and describe the performance or outcome required from products, processes or services.

NOTE This will give a clear indication of where measurable performance requirements need to be developed and will help in future reviews of the RAD.

11.7 Technical authors shall consider commissioning research to produce the necessary performance measures.

11.8 Technical authors shall discuss any non-performance requirements they intend to include within their documents with TSG.

Specific content of DMRB & MCHW RADs for the development of product performance requirements

11.9 Product performance requirements shall ensure that either in the general requirements in RADs or at contract specific level, all product performance requirements are specified in terms of the essential characteristics, relevant to the intended use of the product.

NOTE Failure to do this will result in CE Marked products with "no performance declared" being offered and used in the works.

11.10 Technical authors shall specify all product performance requirements using the same language as the EN or hEN.

NOTE The introduction of the CPR has changed with way for standards to be referenced in RADs. It is no longer sufficient to simply refer to compliance with a standard as was possible with many British Standards for products, as ENs and hENs cover product performance requirements drawn from many Member States.

11.11 RADs shall instruct designers and specifiers to define the product performance requirements through selecting the essential characteristics, using the available levels and classes stated in Annex ZA (or the relevant section of the EAD).

NOTE As each Member State may need different "performance levels" for a construction product, in the case of UK highways authorities, they are at liberty to specify their requirements within the classes and level boundaries set out in Annex ZA of the hEN.

11.12 RADs shall include guidance and instructions to designers and specifiers in relation to specifying product performance requirements by giving:

1. The minimum level
2. A risk assessment which enables the designer and specifier to select the appropriate level or class subject to any factors or variables evident in the proposed location.

11.13 Technical authors shall draft RADs, which require the provision of a value or level against all essential characteristics, even if it is the minimum selectable value.

NOTE 1 The choice of required values for the essential characteristics as applicable to the "intended use" rests with the regulator (in the case of UK highways, National Highways or the other Overseeing Organisations).

NOTE 2 There is no obligation on a manufacturer to declare performance for any essential characteristic for which there is no product performance requirement stated at the time the order is placed. This does not mean that the Overseeing Organisation has to accept any CE marked product with a DoP, it only has to accept those where the DoP meets or exceeds the product performance requirements, defined for each essential characteristic in accordance with the product acceptance requirements of Series 100.

NOTE 3 For any essential characteristics where product performance requirements are not stated at the time the order is placed, the manufacturer is at liberty to provide a product with reduced or untested physical properties for this aspect - No Performance Declared (NPD). This can lead to performance

for this aspect being subject to a special level of performance in the harmonised standard, which is below even the lowest selectable class or level.

NOTE 4 *The simplest and clearest way for the designer or specifier to specify the required performance of products against essential characteristics, is in tabular form, listing all the essential characteristics for the product from Annex ZA and:*

1. *For each, stating its required performance.*
2. *Where any performance class is acceptable, specifying the lowest class and above.*
3. *Confirming when the level of performance is defined on a contract-specific basis.*

11.14 RADs containing requirements for products, whether or not those products are covered by the CPR, must be notified to the EC under the TRSD.

NOTE *Further information on notification of documents is provided in Section 16 to MDD Part 1.*

Accommodating changes in hENs

11.15 Technical authors shall contact TSG at standards_enquiries@nationalhighways.co.uk for advice on how accommodating changes in hENs.

NOTE *Under the CPR, there is no requirement on a manufacturer to revise its product or existing DoP to comply with a change in a hEN, only to take it into account. This means that a product complying with an old hEN carrying a valid CE mark and DoP can continue to be placed on the market when a new hEN is published. It also means that if designers and specifiers set product requirements in compliance with the new hEN and does not accept products complying with the old hEN, it could potentially be seen as a barrier to trade. Current advice is to specify in compliance with the new hEN and rely on SHW clause 104 (equivalence) to guide decisions regarding equivalence should the situation arise.*

Development of additional product requirements

11.16 When specifying products or works covered by hENs or EADs in a RAD, full account shall be taken by the Overseeing Organisation of its obligations under the CPR as a public procurer and as an organisation that sets national standards and specifications, which are a point of reference for the UK highways construction market.

NOTE *Technical authors cannot specify additional requirements that would impede the choice of products that meet performance requirements for the essential characteristics.*

11.17 To allow for situations where stating the essential characteristics at a general level will not meet contract-specific requirements for a product, RADs shall:

1. Leave the selection of class or level of essential characteristic open within limits and instruct designers or specifiers to select a value or class for the relevant essential characteristic for that situation.
2. Provide the guidance by which the designer can develop the appropriate value or class which reflects the site-specific and environmental factors (wherever possible referring to documents already existing for this purpose such as a National Annex).

NOTE *There can be instances where there is a need to give additional product performance requirements beyond those covered by the essential characteristics and these are justifiable in terms of local (contract specific) conditions (e.g. when specifying requirements for sulphate resisting cement in areas of ground prone to thaumasite attack).*

11.18 Technical authors shall not structure requirements and advice on contract specific specifications such that they will result in additional requirements of the same or similar nature being applied on every contract.

NOTE 1 Universally applied contract specific requirements can be viewed as if they are effectively generally applied requirements and hence a barrier to trade. There is evidence of a manufacturer complaining to the EC, citing repeated contract specific requirements, as part of its evidence of non-compliance with EU product legislation.

NOTE 2 Series 000 notes for guidance of the MCHW gives guidance to the Compiler on compiling contract specific specifications.

11.19 Where there is a need to apply additional non-harmonised requirements to cover specific foreseeable and clearly identifiable engineering situations, the need for the additional requirements shall be justifiable with verifiable evidence (not just engineering opinion) and the application of the requirement shall not have the effect of preventing the marketing of products that, but for the additional requirements, would meet the overseeing organisations' requirements related to the essential characteristics.

NOTE An example of this would be testing that is additional to the hEN requirements for oxidisable sulfides in fill materials adjacent to concrete. Generally only the hEN tests would apply unless the fill is adjacent to concrete.

11.20 Where additional requirements are not physical or testing requirements, but other requirements such as quality and marking requirements and restrictions on the materials that may be used, the specification of requirements necessary for the health and safety of workers and other persons in addition to the essential characteristics shall be reviewed [Ref 1], which emphasises that such requirements have to be fully justified, proportionate and not in effect an arbitrary or disguised restriction on trade.

NOTE The burden of proof for such aspects would rest with the Overseeing Organisations.

11.21 Technical authors shall discuss options for including additional requirements for agreement with TSG.

NOTE Including additional requirements will be exceptional and can require a large body of evidence.

11.21.1 Additional requirements may be considered by TSG on the following basis:

1. The proposal shall justify the additional requirements by reference to transparent and available information to determine the associated risks and the need.
2. The additional requirements shall be proportionate to the given situation.
3. The additional requirements shall not pose a barrier to trade.
4. The additional requirements shall be based on a material or performance property that can be specified and achieved by testing.
5. The associated testing methodology shall be drawn from established test methods repeatable in any country. If possible this shall be drawn from the hEN or other existing EN standards for testing that property or aspect.

Performance criteria

11.22 Performance criteria and quality management requirements in RADs shall be proportionate to the issues being addressed.

11.23 Performance criteria shall be clear and enforceable and be clearly expressed to achieve the required outcome.

11.24 Performance criteria shall be specified in terms that are comprehensive and appropriate.

11.25 Performance criteria shall be drafted such that it shall not be possible for the supply chain to deliver a product or service that satisfies the performance criteria but does not achieve the required outcome.

11.26 Features necessary to achieve the required outcomes shall be provided from the performance criteria.

11.27 Where the product falls within the scope of a Harmonised European Standard (hEN) or a European Assessment Document (EAD), the performance criteria shall be selected from the essential characteristics as defined by the Annex ZA of the harmonised standard.

11.28 Performance criteria shall contain where appropriate:

1. Performance parameters (essential characteristics defined in hEN).
2. Appraisal methods (defined by harmonised standards).
3. Appraisal pass/fail criteria (levels or values specified by hEN).

11.29 Where it is not possible to give succinct criteria which the user can select from a document in a straightforward manner, the outcome required shall be stated along with factors and considerations that need to be taken into account in arriving at an appropriate solution.

11.30 Performance criteria shall be:

1. Quantitative rather than qualitative.
2. Measurable and verifiable.
3. Material and process independent.
4. Compliant with EU procurement and product legislative requirements when specifying product requirements (see Section 10.0.)
5. Realistic and achievable.
6. Expressed in the terms used in the hEN where a hEN exists.

11.31 Performance criteria shall not specify:

1. Procedures, processes or methods instead of contract compliance tests on the final product.
2. Materials, except in performance terms.

Performance-based requirements for constructed facilities

Choice between performance-based and method-based requirements

11.32 When developing new requirements or reviewing current clauses, technical authors shall assess the potential for expressing requirements in performance terms.

11.32.1 To decide between performance-based requirements and method-based requirements, technical authors should assess their benefits.

NOTE *A non-exhaustive list of advantages and disadvantages in using performance-based requirements and methods requirements is provided in Annex 3B.*

11.32.2 Where a very limited number of methods exist to verify the specific requirement under consideration, these should be provided as method requirements.

NOTE *For common design situations (i.e. where well-proven technology is required and used) introducing method requirement can provide faster, less costly and more reliable solutions, whereas employing a performance-based approach can be demanding, with design effort being greater and potentially disproportionate.*

11.32.3 Where it is desirable to provide more flexibility to the supply chain to innovate and influence the performance outcomes, performance-based requirements should be introduced.

11.33 For a performance-based approach technical provisions shall be expressed in a manner that makes the intended outcome or the performance requirements (or design objectives) clear to the designer.

11.33.1 A decision tree for the development of performance-based requirements is provided in Figure 3.

‘Pure’ vs ‘mixed’ performance-based requirements

11.34 When developing either ‘pure’ or ‘mixed’ performance-based requirement, technical authors shall assess the required level of performance stemming from users’ needs and goals.

NOTE *Performance-based requirements can be presented either as ‘pure’ performance-based requirement or as ‘mixed’ performance-based requirement as discussed in Annex 3B. A simplified spectrum of requirements from method-based to ‘pure’ performance-based requirements is provided in Figure 4.*

Figure 3. Decision tree for the development of performance-based requirements

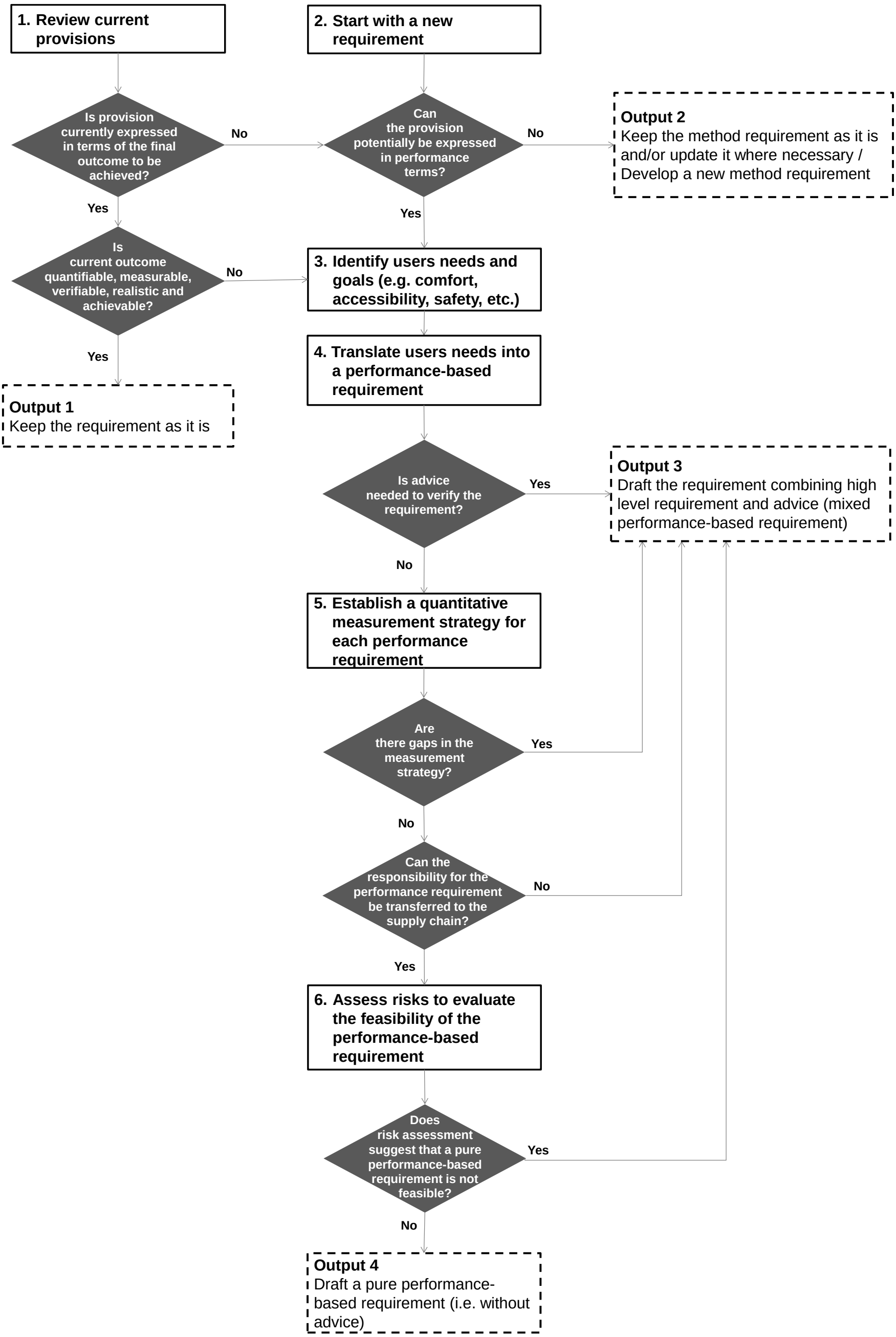
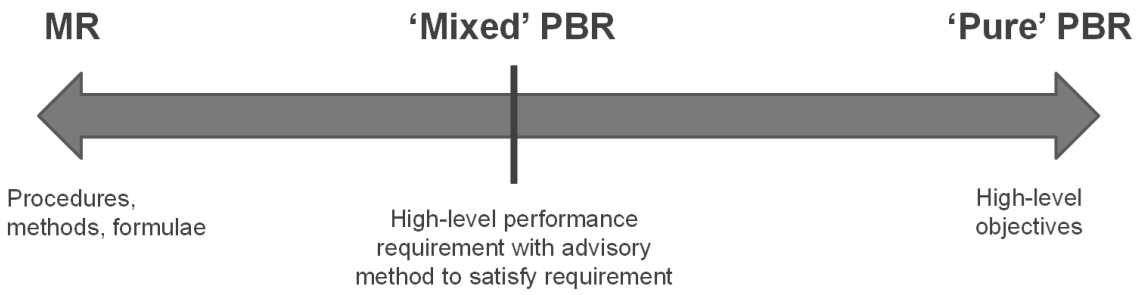


Figure 4. From method-based to performance-based requirements.



11.35 When developing either 'pure' or 'mixed' performance-based requirement, technical authors shall assess the strategies to evaluate / monitor / measure the compliance against the required performance level.

'Mixed' performance-based requirements

11.36 'Mixed' performance-based requirements shall be developed by providing a high-level performance requirement with advisory method to satisfy the requirement.

NOTE Advisory method on the limiting or threshold values accompanying the performance criteria are provided and used as the acceptability criteria to verify that the agreed performance objectives are met.

11.37 Performance criteria shall be:

1. Quantitative rather than qualitative.
2. Measurable and verifiable.
3. Material and process independent.
4. Realistic and achievable.

Pure' performance-based requirements

11.38 When developing a 'pure' performance-based requirement, a quantitative measurement strategy shall be established for each performance requirement.

NOTE A quantitative measurement strategy includes the following activities:

1. *Define what gets measured (i.e. parameters and performance measures) – parameters must be relevant to users goals, as well as quantifiable, measurable, verifiable, realistic and achievable.*
2. *Specify test or evaluation method through which compliance will be determined including considerations on time to collect data, cost, specialised equipment needed, audit.*
3. *Establish sampling plan (sample size, lot size, sample location, frequency, etc.).*
4. *Set performance limits/thresholds including consideration of allowable deviation from the performance standard and consequences for failing to meet the required performance level.*
5. *Determine how the test results will be used (e.g. process control, screening test).*
6. *Determine who will perform the testing.*

11.39 When developing a 'pure' performance-based requirement, technical authors shall identify potential gaps in the measurement strategy.

NOTE Potential gaps in the measurement strategy include:

1. *Technology gap*

2. *Sampling and testing gap*
3. *Knowledge gap*

11.40 When developing a 'pure' performance-based requirement, technical authors shall assess risks.

NOTE Risk assessment includes the following activities:

1. *Identify risks particularly in terms of:*
    a. *monitoring of the proposed performance,*
    b. *maintenance implications,*
    c. *procurement implications,*
    d. *liability issues (reluctance of the supply chain to assume risk, for example because the required performance level is poorly defined),*
    e. *fit for purpose and insurance issues,*
    f. *lack of consistency,*
    g. *time and cost implications of delivering performance-based solutions.*

2. *Define attributes of each risk, including:*
    a. *who assumes the risk (consider how much control over some aspects of the work the Overseeing Organisation is willing to relinquish),*
    b. *the frequency of its occurrence,*
    c. *the impact of the risk,*
    d. *how and where it will manifest itself.*

3. *Plan for risks, i.e. accept, transfer, mitigate or avoid.*

11.41 When developing a 'pure' performance-based requirement, technical authors shall assess the liability/responsibility transfer and shall avoid unreasonable liability being transferred to the supply chain as well as unreasonable risks being placed on the Overseeing Organisations.

NOTE 1 Potential questions to assess the liability/responsibility transfer include:

1. *Does the Overseeing Organisation have authority to transfer the responsibility for the performance-based requirement to the supply chain?*
2. *Does the performance-based requirement put unreasonable liability on the supply chain?*
3. *Does the performance-based requirement put unreasonable risks on the Overseeing Organisations?*
4. *Is supply chain willing and able to assume the responsibility and risk for performance?*
5. *Is there internal (Overseeing Organisations) support to the transfer of responsibility?*
6. *Is there sufficient public support?*
7. *How can project delivery approach allow the re-allocation of responsibility?*

NOTE 2 The establishment of liability for a defect is a complex matters due to design interfaces, multiple design objectives, and the influence of maintenance on performance. The ability to enforce means of recourse such as warranties, guarantees, fitness for purpose is not given for constructed facilities, particularly some years after the design is completed. This is different from what happens for manufactured products and construction materials.

12. Health and Safety

Consideration of the impact of RADs on Health and Safety

12.1 RADs shall require the consideration of safety hazards from design through to construction, maintenance and decommissioning.

12.2 RADs shall make it clear that failure to consider such hazards can lead to increased safety risk and/or substantial additional costs being incurred due to the need for re-design or the addition of mitigation measures during the whole life of the asset.

12.3 Requirements within RADs shall enable the development of solutions to eliminate unacceptable risks and mitigate the remaining risks for all phases of the asset's whole life.

12.4 RADs shall reflect and comply with current Overseeing Organisation provision for health and safety, design risk management (DRM) and national/European Union (EU) legislation.

12.5 When amending a RAD, technical authors shall consider the health and safety aspects of the whole document and not just those relating to the amendments.

NOTE: This activity complements the work on health, safety and wellbeing initiated by the technical author in MDD Part 1, section 8.

Construction (Design and Management) Regulations (CDM)

12.6 For the purposes of CDM, the technical author shall consider the following activities which may attract duties as a Designer:

1. Selection of products for use in construction. The designer must take account of the health and safety impacts arising from their use. (e.g. installation, commissioning, operation, maintenance, and removal)
2. Preparing the specification for a purpose built product or feature.
3. Detailed design undertaken by manufacturers during product development.
4. An approvals requirement that transfers risk back to the Overseeing Organisation.

NOTE The CDM Regulations 2015 require that health and safety are considered from the outset of a construction work. The development of requirements within RADs can in some circumstances be considered as a design activity for the purposes of CDM. Therefore, technical authors can attract some of the duties of a Designer under CDM. Designers are those, who as part of a business, prepare or modify designs for a structure, product or system relating to construction work. The Overseeing Organisation also has duties as the Client.

12.7 The technical author shall have knowledge of current CDM regulations and understand the obligations under CDM and shall develop the document on this basis, referring to National Highways' Health and Safety Team for clarification of National Highways' obligations under CDM if necessary.

NOTE The 2015 revision to CDM removes the role of CDM co-ordinator and introduces the new role of Principal Designer. The Principal Designer is a designer appointed by the Overseeing Organisation in projects involving more than one contractor. The Overseeing Organisation will also appoint a

Principal Designer for network maintenance contracts such as Managing Agent Contracts and Asset Support Contracts. The Overseeing Organisation will expect a nominated person to act on behalf of the Principal Designer organisation and both the nominated person and organisation will be required to have sufficient knowledge, experience and ability to carry out the role.

Safety risk management

12.8 The outcomes for setting policy and requirements through the Overseeing Organisations' document sets shall be equally suitable for use in all the Overseeing Organisations, whether they have adopted GG 104 or not.

NOTE GG 104 has only been adopted for use in National Highways, for other Overseeing Organisations, their specific requirements shall be included.

12.9 RADs shall not be restrictive in permitting or facilitating the adoption of safe working practices by the Overseeing Organisation and its supply chain across all stages of the design, construction, maintenance and operation and the eventual decommissioning, demolition and removal of assets on the Overseeing Organisations' motorway and all-purpose trunk roads.

12.10 Part of the preparation of all RADs shall include:

1. A safety risk assessment, covering the safety risks that are introduced, changed or addressed by the documents (as set out in GG 104 Requirements for safety risk assessment).
2. Preparation of a written record (safety risk report) of how these risks are managed or mitigated through the documents.

NOTE 1 The safety risk report:

1. *effectively records and helps manage risk and cost in setting parameters within a document;*
2. *identifies how risks are controlled or minimised during the development of the document;*
3. *identifies any residual risks known by the technical author that should be passed on to users of the document, including assumptions made to enable users to make sound design decisions that take account of the possible conflicting safety needs of road workers and road users and other stakeholders affected by the asset;*
4. *tracks the development of the RAD such that the final version represents a complete list of all risks considered regardless of whether they were subsequently eliminated.*

NOTE 2 Good safety risk management requires the identification of hazards so far as is reasonably practicable, their elimination or mitigation at all stages of the life of an asset, from specifying requirements through to implementation.

12.11 The words '*safety'* or '*health and safety'* shall not be used without additional qualifying text to explain the context, e.g. safety of road users, health and safety of road workers.

12.12 The health of road users shall be considered (e.g. when considering fumes in tunnels).

NOTE GG 104 sets out the populations to take into account when considering what is reasonably required to manage their safety exposure.

12.12.1 The RAD may require users to carry out their own design-specific risk assessment, taking into account location, anticipated construction, operation and maintenance and working methods and ensure that this is transferred to the health and safety file for the asset.

Consultation with National Highways' Specialist Teams (National Highways Only)

12.13 Prior to commencing drafting, technical authors shall consult with National Highways' National Health and Safety Team regarding the relevant legal requirements.

12.14 Where there is a health and safety issue, perceived or otherwise, identified during the drafting of a document that cannot be resolved by the team and specialists involved, advice and confirmation shall be sought from National Highways' National Health and Safety Team and/or contractors, operators and maintainers as appropriate.

13. Carbon management, sustainable development, and good design

Delivering sustainable and good design outcomes

13.1 Where a product or family of products do not fall within the scope of the Construction Products Regulations or "New Approach" Directives, and is permitted under National, UK and European law, RADs shall align with and encourage application of the principles of sustainable development and good design as set out in the DMRB document GG 103 *Introduction and general requirements for sustainable development and design*.

NOTE *National Highways, The Welsh Government, Transport Scotland and the Northern Ireland Department for Infrastructure (the Overseeing Organisations) believe that understanding the principles of sustainable development and effectively integrating them within the wider framework of 'good design' represents one of the greatest opportunities to enhance the performance of assets and infrastructure on the strategic road network.*

Assessing carbon management, sustainable and good design implications

13.2 Technical authors shall assess how best to achieve the requirements set out in GG 103 *Introduction and general requirements for sustainable development and design*.

13.3 Technical authors shall use the impact assessment report referred to in MDD part 1 to assess documents for carbon management, sustainable development (SD) and good design implications.

13.4 Technical authors shall identify the extent to which RADs can contribute to the principles of good road design and seek to accord with these principles for requirements applicable in the relevant Overseeing Organisation.

NOTE *The principles of good road design that feature in the draft DMRB document relevant to National Highways have also been published separately in the publication 'The road to good design' [https://www.gov.uk/government/publications/the-road-to-good-design-highways-englands-design-vision-and-principles].*

13.5 Through the Impact Assessment, technical authors shall:

a) assess, and clearly state, the levels of impact that RADs will have on the economy, society and the environment;
b) consider how their documents (and the subsequent designs and specifications) can impact on the creation of greenhouse gas emissions and whole lifecycle carbon in the infrastructure National Highways provides;
c) consider how their document can help National Highways transition to a 'Net Zero' carbon organisation and influence our customers to join our 'Net Zero' vision.

Drafting considerations

[DRAFTING NOTE: Further guidance and examples will be added to this section shortly. National Highways staff are recommended to complete the Sustainability at National Highways e-learning module.]

13.6 RADs shall be drafted such that they can meet our customers' present needs without compromising the ability to meet their future needs.

13.7 Using relevant European and British standards, as well as GG 103, technical authors shall draw on sustainable development and low carbon best practice to author RADs for the design and specification of our infrastructure.

13.8 Technical authors shall consider how RADs can encourage and build the infrastructure to allow zero emissions from freight, vans and cars, as well as to make it easier to allow journeys by public transport and supporting walking and cycling.

13.9 Technical authors shall consider how RADs can promote the carbon management hierarchy reproduced below, which is part of the concept of 'circular economy and an important element of the National Highways' 'Net Zero' carbon vision:

a) build nothing or select an alternative lower carbon approach;
b) build less, by maximising use of existing assets and reducing the construction requirement;
c) build clever with low carbon material options, streamlined delivery and minimising resource consumption; and
d) build efficiently by embracing efficient technology, for example in construction, maintenance and operation and eliminating waste.

13.10 Technical authors shall consider how RADs can promote (or at least not inhibit) the adoption of zero carbon materials for construction and maintenance, helping National Highways achieve its aspirations of 'Net Zero' maintenance and construction by 2040.

NOTE 1 This is an important aspect to encourage the adoption of innovative solutions.

NOTE 2 Choices in materials and efficiencies in product design, manufacture, installation, and maintenance processes all make a significant difference to the carbon creation.

13.10.1 Technical authors should consider the use of the Inventory of Carbon and Energy (ICE) or Environmental Product Declarations to show the expected carbon footprint per weight, length or volume of a product and compare this to the carbon footprint of other materials.

13.11 Technical authors shall consider how RADs can improve maintenance practices for example by adopting innovative ways of conducting maintenance such as using recycled water, recycled materials or utilising more efficient plant and machinery, which can help National Highways achieve its 'Net Zero' targets.

Background

Sustainable development

Sustainable development is a concept founded on the normative aspiration of "meeting the needs of the present without compromising the ability of future generations to meet their own needs." World Commission on Environment and Development, United Nations 1987

Sustainable development is defined in the National Highways: Licence (2015) as: "…encouraging economic growth while protecting the environment and improving safety and quality of life for current and future generations."

Five capitals of sustainability

This definition is underpinned by the Overseeing Organisation's five capitals of sustainability:

1. (human) protecting and improving the safety of road users and road workers,
2. (social) improving the well-being of road users and communities affected by the network,
3. (financial) supporting national and local economic growth and regeneration,
4. (manufacturing) ensuring efficiency and value for money,
5. (natural) protecting, managing, and enhancing the environment.

The Overseeing Organisation recognises that sustainable development is a continuous process – not an end point. It is a process that continually seeks to achieve a balance between social, economic, and environmental outcomes.

Climate Change Act and the Net Zero strategy

The Climate Change Act (2050 Target Amendment Order) (2019) put in place the requirement, that by the year 2050 the UK's net carbon creation will be at least 100% lower than the 1990 baselines.

National Highways is committed through its protocol to factor carbon into its design decisions and approaches to the construction, maintenance, and operation of its network. National Highways also plays its part in contributing to the government's plans for a low carbon future.

The car journeys and freight movements made on the strategic road network today, which enable us to travel to work, enjoy recreation time, help deliver our shopping, and keep the UK's economy moving will still be required as the UK transitions to a fossil fuel free economy by 2050.

Our customers will still require the same level of high service from the strategic road network in the clean travel future. The investment in roads will continue to keep them in good condition, meeting our customers' needs and keeping our economy moving. However, the expectation is that the investment will have a 'Net Zero' carbon impact.

National Highways will continue to invest in new technologies like Digital Roads, meaning we can utilise our existing roads more efficiently, cutting the need to build new and achieve our aspiration of 'Net Zero' operations by 2030.

National Highways will also take necessary steps to achieve its aspirations of 'Net Zero' maintenance and construction by 2040.

The drafting principles presented above will help National Highways to achieve sustainable development as defined in our Licence: '…encouraging economic growth while protecting the environment and improving safety and quality of life for current and future generations' and support the government's vision to deliver zero carbon transport by 2050.

These will also ensure that sustainable development and carbon management is a continuous process. National Highways will constantly pursue a balance between economic, social, and environmental variables.

Reference publications

National Highways: Licence (2015)
Road Investment Strategy: 2015 to 2020
National Highways - Sustainable Development Strategy: Our approach
National Highways - Net Zero strategy – to be published soon

14. Equality, diversity, and inclusion

Equality, diversity, and inclusion considerations

14.1 When drafting a document, the actual, potential, and likely impacts on protected groups shall be identified, systematically assessed, and recorded so that outcomes are achieved in a reasonable and proportionate way.

14.2 Where any unfair adverse impacts are identified for particular groups, mitigating action or a change in the document shall be needed.

NOTE *If a document is minor and technical, there can be sufficient existing information to conclude that the document will have a neutral impact on people with protected characteristics.*

14.3 Technical authors shall comply with current equality legislation and be alert to CD 143 Designing for walking, cycling and horse-riding (covering vulnerable groups).

14.4 Technical authors shall also follow the best practice known as the 'Brown Principles' relating to the PSED.

NOTE *The Brown Principles state that anyone who exercises public functions (including those who deliver services on behalf of public sector organisations) must be consciously aware of the general requirements of the equality duty. The duty must be considered from the outset when a project/function is in progress so that decisions are not taken retrospectively or as a simple tick-box exercise.*

14.5 The technical authors shall gather sufficient information to influence decisions and keep auditable records that show proper accountability and ensure that implementation is considered as part of ongoing review.

Equality Impact Analysis (EqIA)

14.6 Technical authors shall identify whether the document should include guidance on the need to carry out an EqIA as part of the design or construction process.

14.7 Where the document should include guidance on the need to carry out an EqIA as part of the design or construction process, guidance shall be included within the document and/or a requirement to contact the Overseeing Organisation for access to the appropriate guidance on completing an EqIA.

NOTE *There is no prescribed process for assessing the impact of proposals on different groups, but in the context of drafting RADs, an EqIA (which covers screening and analysis) can provide a structured way to help technical authors avoid unconscious discrimination and identify opportunities to promote equality and good relations between different groups. It also serves as an auditable record of the decisions taken and can provide a useful defence against any challenge.*

14.8 Where an EqIA is not considered relevant for the development of a document, this decision shall be recorded with supporting information for the audit trail and shall be agreed by the Technical Standards Committee for the document who will substantiate that the requirement concerned has a neutral impact on all groups (e.g. that it is a purely technical change with no adverse impacts on particular groups).

Barriers to providing an inclusive service

14.9 Any RADs which affect the road-using public or neighbourhoods impacted by the Overseeing Organisations' motorway and all-purpose trunk roads shall be assessed for the potential to create barriers to those with protected characteristics.

NOTE 1 There are many kinds of barriers, including:

1. *Architectural barriers - these can result from the design or layout of a facility.*
2. *Physical barriers - refer to objects added to the environment.*
3. *Information or communication barriers - choices of communication can introduce barriers that make it difficult for people to receive or send information (e.g. the use of language that will only be readily understood by particular groups of road users).*
4. *Attitudinal barriers - refer to a failure to engage effectively with the specific needs of all population groups.*
5. *Technology barriers - devices such as computers, telephones, and inadequate or inappropriate assistive technologies, which may impede rather than assist.*
6. *Systemic barriers - can result from an organisations' policies, practices and protocols if they exclude parts of the population (e.g. women, ethnic groups, people with disabilities etc.).*

NOTE 2 In the context of developing RADs, the likelihood is that not all of these barriers will be relevant.

NOTE 3 Table 5 provides advice on the areas to consider when developing or updating a RAD and the barriers associated with each.

Diversity issues

14.10 RADs shall encourage design in terms of safe accessibility.

NOTE 1 Rapid advances in assistive technology mean that some physical impairments are no longer an impediment to using Overseeing Organisations' motorway and all-purpose trunk roads, either as a non-motorised or motorised user.

NOTE 2 As the driving population gets older and people become less reliant on others to utilise the Overseeing Organisations' motorway and all-purpose trunk roads, this can have an effect on how it must adapt to their needs and it may be necessary to address how information is presented to road users.

14.11 Where there is a lack of knowledge about how physical impairments or other diversity considerations might affect someone's ability to use the Overseeing Organisations' motorway and all-purpose trunk roads, technical authors shall consult organisations and stakeholders that understand these issues so that they can contribute to the RADs and the EqIA process.

Table 5 Advice on areas to consider when developing or updating a RAD and the barriers associated with each

Areas to Consider when Developing RADs	Barriers
Disability: Disabled people with physical, mental, sensory, visible or hidden disabilities • **Physical impairment** – including limited mobility, such as the head and neck, as well as impaired co-ordination of upper or lower limbs. Also, physical reactions to noxious materials and stimuli may need to be considered. • **Sensory impairment** – including sight or hearing impaired, which might make perception in specific situations difficult, such as information being presented too quickly or in the wrong format. • **Mental / comprehension** – examples of this might include impairments which make comprehension of routine situations more difficult. This might be exacerbated by inconsistent use of hazard or warning signals, or information being presented too quickly. • **Limitations to either speech or language** – comprehension or communication capability. For advice on the needs of disabled people, technical authors shall refer to document CD 143 Designing for walking, cycling and horse-riding	Attitudinal Technological Information Communication Architectural Physical
Race: People from various ethnic groups. technical authors shall guard against information being presented too quickly or in the wrong national language or using an inappropriate language/image or format.	Attitudinal Information Communication
Sex: Men, women, married people, parenting, caring, flexible working and equal pay considerations. The predominating areas for concern might be personal safety and lack of information.	Attitudinal Information Communication Architectural
Sexual Orientation: Heterosexual and bisexual men and women.	Attitudinal
Religion or Belief: People who have a religious belief; atheist or agnostic people and people who have a philosophical belief which affects their view of the world.	Attitudinal
Age: Young, old and middle-aged people. Consider both ends of the age spectrum. Elderly users may have limitations in body response and joint flexibility and range, reductions in cognitive ability, perception, and mobility, as well as concerns for personal safety and wellbeing. Younger users may have issues regarding safety, lack of awareness and accessibility. For advice on the needs of elderly non-motorised users refer to document CD 143 Designing for walking, cycling and horse-riding	Attitudinal Technological Information Communication Architectural Physical
Gender reassignment: Transgender and trans-sexual men and women.	Attitudinal
Pregnancy/maternity: Pregnant women and new mothers.	Attitudinal Architectural Physical
Marriage and civil partnerships: Marriage - but only in respect of eliminating unlawful discrimination for civil partnerships.	Attitudinal

Background

Public Sector Equality Duty (PSED)

A sustainable and prosperous society depends on the Overseeing Organisations' motorway and all-purpose trunk roads. Motorway and all-purpose trunk roads are

a major contributor to the quality of life of millions of people and their ability to travel and gain access to employment and services. It is therefore important that the Overseeing Organisations and those delivering services on their behalf understand and comply with the *Equality Act 2010* which consolidates protection against discrimination on the grounds of age, disability, race, sex, sexual orientation, marital status, religion or belief, gender reassignment, pregnancy and maternity.

The *Equality Act 2010* places the PSED on public bodies which requires them to have 'due regard' to the need to:

a. Eliminate unlawful discrimination, harassment, and victimisation.
b. Advance equality of opportunity.
c. Foster good relations between people who share a protected characteristic and those who do not, with the aim of making society fairer.

It relates to decisions on employment and service delivery and requires transparency and accountability.

Having 'due regard' means consciously thinking about the three aims of the duty to ensure the services or products provided are appropriate, accessible and meet the needs of protected groups using these services or products as well as the local communities that maybe affected by work on the Overseeing Organisations' motorway and all-purpose trunk roads.

Further information

National Highways Equality Impact Guidance - http://share/Share/LLISAPI.dll/overview/20050656

Inclusive Mobility: https://www.gov.uk/government/publications/inclusive-mobility

TRL Overseas Road Note 21. Enhancing the mobility of disabled people: Guidelines for practitioners: https://www.gov.uk/research-for-development-outputs/overseas-road-note-21-enhancing-the-mobility-of-disabled-people-guidelines-for-practitioners

Disabled Persons Transport Advisory Committee, DPTAC: https://www.gov.uk/government/organisations/disabled-persons-transport-advisory-committee

Equality and Human Rights Commission publications: http://www.equalityhumanrights.com/publications

Annex 3A Legislation affecting RAD drafting

[DRAFTING NOTE: This section will be updated shortly to reflect the UK exit from the EU and some of the links may now be obsolete.

Withdrawal from the EU.

The process of withdrawal is ongoing, and until it is complete, users should continue to put their requirements in term of the essential characteristics of Harmonised / Designated standards. It is not expected that accreditation to CE / UKCA marks will change in the short term, but the list of designated standards and the products that fall within their scope may change over the longer term. Base documents and Northern Ireland NAA / NDR will continue to be assessed for notification to Europe where they fall within the scope of the Northern Ireland Protocol.]

A1 Introduction

This Annex provides information on those items of EU and other legislation that affect drafting of RADs. It covers an overview of the legislation affecting the content of RADs, specific terminology related to National and European legislation, and the following regulations and directives in more detail:

- Construction Products Regulation (CPR) EU 305/2011.
- Low Voltage Directive (LVD) 2006/95/EC (being replaced with effect from 20 April 2016 by LVD 2014/35/EU.
- Electromagnetic Compatibility Directive (EMCD) 2004/108/EC (being replaced with effect from 20 April 2016 by EMCD 2014/30/EU.
- Radio Equipment Directive (RED) 2014/53/EU (replaces the Radio and Telecommunications Terminal Equipment Regulation).
- Machinery Directive (MD) 2006//42/EC.
- Mutual Recognition Regulation (MRR) 764/2008/EC.
- Technical Standards and Regulations Directive (TSRD) 20151535/EU.
- Public Procurement Directive (PPD) 2014/24/EU.

A2 Legislation affecting the content of RADs

Legislation forms one of the key drivers for RADs' development to ensure that they convey the requirements of the Overseeing Organisation and the actions required of the supply chain to deliver works that meet the Overseeing Organisation's legislative obligations.

Legislation comes from three main sources:

- International legislation and treaties – e.g. World Trade Organisation (WTO) rules.
- EU Legislation – e.g. Construction Products Regulation (CPR), Public Procurement Directive (PPD), Mutual Recognition Regulations (MRR).
- UK and National legislation – e.g. *Construction (Design and Management) Regulations (CDM Regulations)*, equality and diversity legislation.

There are many types of legislation that affect the content of RADs and they fall into three main categories:

a. Legislation that affects particular aspects of design, e.g. the CPR, *CDM Regulations* environmental legislation, *Manual Handling Operations Regulations*, *Traffic Act*, *Highways Act*, etc. In meeting the Overseeing Organisation's legislative obligations, it may be necessary for subject specialists to provide guidance to technical authors on the design issues to take into account when drafting RADs.

b. Legislation that affects the supply of materials and the construction of works, e.g. *Manual Handling Operations Regulations*, environmental legislation, CE Marking, Electromagnetic Compatibility Directive (EMCD), Low Voltage Directive (LVD), Radio Equipment Directive (RED), Machinery Directive (MD). This category of legislation is an obligation of delivering compliance that the supply chain must meet when constructing the works. In many cases, RADs do not need to restate that requirement, but may require members of the supply chain contracted to the Overseeing Organisation to provide evidence of compliance with that legislation.

c. Legislation that affects the manner in which the content of RADs is drafted and governance processes, e.g. the CPR, *CDM Regulations*, Technical Standards and Regulations Directive (TSRD), PPD, MRR etc. This category of legislation is mainly concerned with meeting UK obligations with regard to providing a safe working environment as well as to facilitate free trade, principally in the EU but also wider world trade.

A3 Specific terminology

Construction Product

Under the CPR, a construction product is defined as any product, 'kit of parts' or proprietary design commercialised as a product which is produced and placed on the market for incorporation in a permanent manner in construction works. The performance of this product has an effect on the performance of the construction works with respect to the basic requirements for the construction works.

A product falls under the CPR if it lies within the scope of a Harmonised Standard (hEN) or a European Assessment Document (EAD).

In this context, 'kit of parts' means a construction product placed on the market by a single manufacturer as a set of at least two separate components that need to be put together to be incorporated in the construction works.

A proprietary design commercialised as a product covers products which are created entirely on site to a proprietary design, such as in-situ concrete barriers.

A construction product can have multiple CE marked components, e.g. steel plate, nuts and bolts, etc., that may be used in a larger product that is itself covered by a CE mark.

European Standard (EN)

An EN is a standard that has been adopted by one of the three European Standardisation Organisations..

Harmonised European Standard (hEN)

Harmonised Standards (hENs) are given this status by their citation in the Official Journal of The European Union (OJEU). hENs under the CPR consist of two main parts:

- The main body of the document.
- Annex ZA, compliance with which is mandatory for the purposes of CE marking of construction products. It is this annex that contains the essential characteristics for the product and the information necessary for CPR compliance.

The harmonising part of the standard is informative as far as application of the requirements to the product is concerned but normative for the manufacturer of the product to comply with the CPR. Confusingly, it is titled as an informative annex. The harmonising annex refers to parts of the voluntary standard to give its requirements, effectively mandating these parts. There are also informative and normative annexes covering particular technical issues in the standard and providing additional information to support the main body of the standard.

Technical authors shall be aware that standards harmonised under other EU product legislation may affect the specification of construction products. As a result, a product may be CE marked under both that legislation and the hEN.

CE Marking

The CE mark indicates compliance with the requirements, and methodology to confirm the performance, of a hEN. Where a construction product is covered by a hEN or EAD, a CE mark is the only mark that attests conformity of a construction product.

A manufacturer must affix a CE mark when a product falls under the scope of a harmonised standard.

National marks and quality marks (e.g. Kite Marks or British Board of Agrément (BBA) certificates) are no longer permitted to be set as requirements by Member States. They may be shown voluntarily by manufacturers but RADs must not require or refer to these alternative quality marking systems.

For the latest advice on CE marking prior to the CPR, technical authors should refer to the EC's FAQs on the CPR [Ref 1] and the Construction Products Association's *Guidance Note on the Construction Products Regulation* [Ref 2].

If a CE Mark was granted under the Construction Products Directive (CPD) it is still valid; there is no obligation on the manufacturer to renew or amend it under the CPR. The manufacturer need only apply for a new CE mark if the product changes significantly from the design or specification under which it was originally granted.

Declaration of Performance (DoP)

The DoP is a document developed in agreement with the manufacturer and the Notified Body (or Technical Assessment Body). It gives the performance of the product in terms of the essential characteristics, and uses classes and levels available for selection in the Annex ZA of the harmonised standard (or relevant section in the EAD).

The manufacturer must provide the Declaration of Performance before a product is delivered.

The EC has agreed that DoPs may be provided by publication on the manufacturers' website. This would be particularly applicable for bulk materials such as aggregates or timber where the supply of a paper DoP with each delivery would be an administrative burden on the manufacturer.

The DoP is provided on the basis of initial type testing and factory production control. This is based on the system of Assessment and Verification of Constancy of Performance (AVCP) defined in Annex ZA of the hEN.

Product Performance Requirements

Product performance requirements are the set of minimum values or classes to be attained by construction products, given to the manufacturer by the specifier when the order is placed.

Member States (and therefore National Highways and the other Overseeing Organisations) may only use the essential characteristics to define the product performance requirements.

Achievement of the product performance requirements can only be satisfied by provision of a DoP which meets or exceeds them, for each essential characteristic.

Product performance requirements for construction products are developed on a contract specific basis by construction professionals.

For construction products outside the scope of a hEN or EAD, see 'Non-harmonised Standards'.

Assessment and Verification of Constancy of Performance (AVCP)

The requirements for AVCP and its different levels are set out in the CPR. The levels of AVCP are stated in the mandates for harmonised standards issued to CEN by the EC. In hENs, the requirements for AVCP are given in Annex ZA. EADs also contain information on AVCP systems for the products they cover.

AVCP is comprised of systems (numbered 1+, 1, 2+, 3 and 4) which define the tasks the manufacturer or Notified Body (NB) have to undertake in order to ensure the product meets and continues to meet the essential characteristics. The system of AVCP is set at a consultation stage and agreed by the EC in product mandates. The system defines the extent to which NBs are involved in the assessment of product conformance and factory production control. There can be more than one NB covering a manufacturer's product dealing with different aspects of the AVCP.

There are situations where the level of AVCP in a hEN may not be deemed appropriate by technical authors for the intended use. If any further reassurance is required for products, technical authors shall speak to TSG. Unilateral changes by Member States to AVCP systems are not permitted under the CPR; any changes must be made through dialogue with the Standing Committee on Construction (SCC) .

National Annex

A national annex sets out appropriate minimum performance levels for specific intended use of a product to take into account the local differences, such as climate and geography, between Member States.

Unless the main body of the standard recognises that additional, Member State specific, parameters are permitted to be included in national annexes, they can only be regarded as informative annexes.

However, RADs may refer to national annexes to set general performance requirements for use by designers and specifiers.

European Assessment Document (EAD)

EADs are documents developed by European Organisation for Technical Assessment (EOTA) to allow the development of a European Technical Assessment (ETA) between an individual manufacturer and a Technical Assessment Body (TAB) for the purposes of CE Marking a product for which no hEN exists. The development of new EADs starts with a manufacturer's application for an ETA for a type of product not covered by existing hENs or EADs (thus differing from hENs which are developed on the basis of a mandate issued from the EC). This flexibility may give rise to EADs being developed in as little as six months. The use of EADs by manufacturers is voluntary.

Where a manufacturer has applied for an ETA for their product, there is no legal requirement for other manufacturers of similar products to CE mark their products by conforming to the EAD and applying an ETA to their products. However, for commercial reasons, it may be advantageous for them to do so.

In contrast, Member States must specify products which fall under the scope of an EAD in terms of the essential characteristics given in the document. Member States must also specify acceptance criteria for products without an ETA and accompanying CE mark.

An EAD is not sufficient in itself to allow the manufacturer to affix a CE mark to their product. An ETA has to be in place.

European Technical Assessment – ETA (CPR 2013 - Present)

An ETA is a harmonised technical specification containing:

- General information on the manufacturer and the product type, name and manufacturing plant.
- Performances of the product to be declared and references to the methods used for its assessment.
- Technical details necessary for the implementation of the AVCP system (see 0).

An ETA allows a manufacturer to affix a CE Mark where no harmonised standard for their product exists.

European Technical Approvals - ETA (CPD 1989-2013)

Under the CPD (1989 to 2013), ETA meant a European Technical Approval and required a European Technical Approval Guideline (ETAG). Although many of these ETAs and ETAGs are still valid, there is a programme to transfer all ETAG documents to EADs. Manufacturers with these existing ETAs are under no obligation to update their documentation to CPR ETAs.

Non-harmonised Standards

Non-harmonised standards generally fall into four types:

- National standards - e.g. British Standards published by BSI.

- International standards – e.g. ISO standards.
- European standards – e.g. EN standards which have not been harmonised.
- Other national and industry standards issued by national standards setting bodies e.g. DIN (the German Institute for Standardisation), International Electrotechnical Commission (IEC).

For products that are not covered by hENs or EADs, technical authors shall use the above document types where they exist for a product to define RAD requirements and guidance rather than developing unique or bespoke requirements.

However, technical authors should be aware that there is an ongoing programme within National Highways to develop hENs which will require subsequent revision to existing documents, when both harmonised and non-harmonised standards are permitted to be current.

Where a product is not covered by a hEN or EAD, technical authors shall establish the acceptance criteria for its use by considering what proof of claimed performance is required.

Use of product certification systems, such as BBA HAPAS certifications or quality marks such as BSI Kite Marks as proof of claimed performance, has significant cost implications for product manufacturers and consequently for scheme costs related to those products.

Therefore, technical authors drafting RADs, which propose to require product certification or quality marking, shall ensure that any requirements reflect the risks and consequences of failure of that product and the cost implications for that product. Any cost implications should take into account the likely frequency of use and unit cost of the product. The cost of any such scheme shall not be disproportionate to the cost of the product. Further advice may be obtained from TSG.

A4 Construction Products Regulation (CPR)

This section provides detailed guidance on the CPR from the perspective of the Overseeing Organisation, which is a public procurer responsible for issuing documents that influence the requirements for products placed on the UK highway construction product market (in reality, “regulations” in EU legislative terms).

This section is not a substitute for reading the legislation and published guidance from the EC and others, but provides direction for technical authors on issues that will need to be considered in the preparation of RADs.

This section is not a legal interpretation of the legislation and, where questions arise, seeking legal advice is recommended.

Overview

The CPR is a European Regulation laying down harmonised conditions for the marketing of construction products. In July 2013, it became mandatory for manufacturers to affix a CE mark and provide a DoP for products which fall within its scope. It also placed an obligation on Member States to define performance requirements for construction products in terms of their essential characteristics.

CE Marking is the only permitted mark attesting performance of the product and Member States cannot impede CE marked products being made available on their national markets when their performance requirements against the essential characteristics are met.

The CPR replaces the CPD. When the CPD was transposed into UK legislation, the UK treated certain requirements of the CPD as optional rather than mandatory; principally only requiring voluntary CE marking by manufacturers for placing products that were within the scope of the CPD on the UK market. Compliance with the CPR is a legal requirement and its introduction has signalled a necessary change in the way RADs are prepared.

The overall objective of the CPR is to prevent/remove barriers to trade within the EU and to support the EU treaty obligations placed on Member States with respect to the removal of such barriers. When fully implemented, this has the effect of increasing the opportunity for competition within the supply chain. There is also the potential for reduced costs when selecting the products across a range of manufacturers based on the same declared performance criteria.

The CPR not only deals with the safety of products but also their performance, as construction products are intermediate products that form part of complete construction works. The CPR limits the way in which the performance of products may be defined where those products are covered by hENs or EADs.

While the CPR has some differences compared with other EU product legislation, it has aspects of a shared knowledge base. The EC's *The Blue Guide* [Ref 3] on the implementation of EU product rules provides a useful resource of knowledge on EU product legislation and related information (e.g. EU trade agreements) that may provide useful background.

The Construction Products Association's *Guidance Note on the Construction Products Regulation* is a useful publication for reference [Ref 2].

Key points

The following sections explain two concepts, which are key to understanding the CPR.

1. Basic Requirements for Construction Works

"Basic requirements for construction works" has a specific meaning within the terms of the CPR as set out in Annex 1 of the CPR. The harmonised technical specification for a product defines the methods of assessing and declaring all the performance characteristics required by regulations in any Member State, which affect the ability of construction products to meet seven basic requirements for construction works:

1. Mechanical resistance and stability.
2. Safety in case of fire.
3. Hygiene, health and the environment.
4. Safety and accessibility in use.
5. Protection against noise.
6. Energy economy and heat retention.
7. Sustainable use of natural resources.

2. Essential Characteristics of a Construction Product

Essential characteristics of a construction product has a specific meaning within the terms of the CPR and are those characteristics that have been identified as being necessary to deliver some or all aspects of the "basic requirements for construction works" for that product. The list of essential characteristics for each product can be

found in the relevant harmonised technical specification. In hENs they are listed in Annex ZA and are set following consultation with Member States by the EC during the development of the earlier mandate and the standard.

In addition to the essential characteristics, harmonised technical specifications can include testing, calculation and other means for assessing performance in relation to these essential characteristics.

Public bodies may only specify the performance of a product in terms of its minimum class or level for the essential characteristics.

Consequences of the Introduction of the CPR for Overseeing Organisations

The previous voluntary approach to the CPD in the UK caused a failure to fully appreciate the significance of the impact of CE marking of construction products on the drafting of RADs. In addition, existing RADs had in place well established product assurance processes that were necessary to cover the UK position that CE marking was optional for manufacturers to place a product on the UK market.

Historically, UK highways authorities' technical documents have specified what products should be used in a highly prescriptive manner. This is no longer acceptable under the CPR with a performance or outcome based approach now being required. Other EU Member States had incorporated the CPD into law and co-developed the majority of existing hENs. This has not only left the UK with a legacy of RADs and procedures which need to be amended to comply with the CPR, but most of the existing hENs will not have had the benefit of detailed feedback resulting from implementation in the UK.

Through ongoing UK involvement in the development of hENs, it is hoped that any aspects which lead to difficulties for the UK may be addressed by changes achieved through CEN committees and the SCC.

Technical Author Responsibilities in Relation to CPR

Overall responsibility for delivery of compliance with all legislation, including the CPR, remains with the technical author.

The technical implications of the CPR in relation to technical authors' subject areas are also the responsibility of the technical author. This includes consideration of any factors in the hEN or EAD (and associated documents) and the product mandates that form the agreement between the EC and CEN on the contents of hENs.

How to Comply With and Failure to Comply With the CPR

In order for RADs to be and remain compliant, technical authors shall:

a. Keep their knowledge of forthcoming legislation up to date and initiate appropriate actions to keep their RADs compliant.
b. Define requirements in the same language as the hEN.
c. Be aware that there is an ongoing programme to develop hENS. The legislation requires existing documents to be updated within the coexistence period.
d. Anticipate and participate in the continual development of legislation, hENs, product mandates and EADs.

Overseeing organisations have various mechanisms for engaging with future developments (horizon scanning). In addition to being both proactive in identifying and reacting to change, technical authors may also with to contribute to the UK response to proposed alterations with the objective of influencing those decisions so that they do not adversely impact upon business needs of the organisation.

Technical authors will need to gather information from various sources in order to fulfil the obligations listed above:

a. Europa website (hEN list) for the CPR [Ref 4].
b. Europa website useful CPR information [Ref 5].
c. EOTA website [Ref 6].
d. ETA Database [Ref 7].

As all Member States are required to notify their national product requirements to the EU under the TSRD, the Technical Regulations Information System (TRIS) website [Ref 8] provides a useful potential source of information on product requirements being adopted by other EU Member States. This may mean that developing new requirements is unnecessary.

British Standards on Line (BSOL) provides copies of BS ENs and other BSs. National Highways has a subscription to this service for National Highways staff. A request may be sent to the standards enquiries inbox, Standards_Enquiries to obtain a user 'id' and password.

Penalties for Failure

Failure to comply with any EU legislation exposes the Overseeing Organisation to the risk of the EC proceeding with an infraction (infringement) against the UK through the European Court of Justice. If not addressed, this will ultimately lead to significant fines, which can be in excess of £10m per infraction, with daily fines and associated reputational damage to overseeing organisations. There is also the significant disruption and cost during the progress of the case and handling any uncertainties in the supply chain.

Presumption of Conformity of CE Marked Product

A manufacturer's DoP for a product, in association with a CE mark applied to the product in conformity with the CPR, carries with it a presumption of conformity of the product to the declared performance.

This prohibits the technical author from including the following as part of the approval of proposals to use products:

a. Additional testing as a condition of initial product acceptance.
b. Third party product quality assurance (e.g. quality marks).
c. Technical approvals.
d. Limitations on acceptable materials (e.g. when product performance requirements would allow a choice of polymer modified or epoxy resin concretes, only specifying one material as acceptable).

Additional restrictions on tolerances or performances that are not permitted by the hEN or EAD as purchaser choices.

However, this does not prohibit contract compliance testing or commissioning testing of products once they have been supplied to site or installed.

In drafting RADs, it shall be made clear which criteria apply to acceptance of a product proposal and which criteria apply to contract compliance.

Public procurers cannot include within the product specification a requirement for the manufacturer to provide the supporting information for the CE mark and the DoP.

Any requirements for supporting evidence shall take fully into account the primacy of CE marking for the essential characteristics.

Through their RADs, technical authors shall make users aware that for a product proposal to be acceptable, it must not only be CE Marked, but the DoP shall show that the product meets the project-specific intended use and specified performance.

When a manufacturer places a product on the market that falls within the scope of a hEN, or which is covered by an EAD, it has to provide a DoP. The DoP is provided on the basis of initial type testing and factory production control commensurate with the level of the AVCP defined in the harmonised standard.

Specifying Product Installation and Maintenance

The CPR places obligations on product manufacturers to ensure that information is provided with the product on how it should be installed and maintained. This does not require manufacturers to provide training on the installation of their products, although some manufacturers could choose to deliver their CPR obligations in this way.

Technical authors shall not transfer risk by giving additional or contradictory installation requirements for products in RADs.

Such requirements may not only reduce manufacturers' responsibilities under the CPR, but also attract liabilities to the Overseeing Organisation under health and safety legislation.

National Highway Sector Schemes (NHSS)

National Highways has requirements for some products to be manufactured or installed under industry sector specific quality management schemes known as National Highway Sector Schemes (NHSS). A list of permitted NHSS is given in Appendix A of the SHW. In such cases, where manufacturers provide training schemes for products within the scope of the CPR, they may choose to deliver these through a sector scheme but this cannot be mandated in RADs.

Sector schemes that are permitted under the CPR address installation and workmanship issues on behalf of industry bodies. These sector schemes were largely established prior to the introduction of CPR and are mandated through the SHW. They perform a valuable role in the overall technical governance arrangements National Highways has in place, providing assurance that the products are used and installed correctly as part of the works.

With the introduction of the CPR, those sector schemes related to the manufacture or distribution of CE marked products may no longer be mandated unless they can be used in RADs in ways that do not represent a barrier to trade. Examples of potentially acceptable approaches include:

a. The use of more contract compliance testing for products produced or distributed outside a NHSS compared to those produced or distributed by a NHSS registered company.
b. Where other EU standards (e.g. a design standard) related to a product require a quality management scheme to be applied to a product, use of NHSS registration as a means of satisfying the criteria without the need for the submission of additional evidence.

NHSS advisory committees are modifying the content of schemes so that they are CPR compliant and therefore allow them to be set as a requirement during the implementation of construction projects and share the benefits from the assurance advantages they offer.

Where a NHSS exists which can be mandated without contravening the CPR, technical authors shall ensure alignment between the requirements in the RAD and the sector scheme by adopting the principle that the sector scheme follows National Highways' requirements. Consequently, technical authors shall ensure that those representing National Highways on sector scheme committees are consulted when changes to requirements are contemplated, to ensure any necessary changes to the sector scheme requirements are effected.

Where no sector scheme exists, technical authors shall ensure assurance measures for installation and maintenance are included within the text and that they are cognisant of the obligations placed on manufacturers as part of the CPR.

Testing

Testing Required Before Supply (Acceptance Testing of Non CE Marked Products)

Testing is a requirement for acceptance of the supply of the product. It may be initial type testing or it may be production testing of the main production run of products.

The RAD shall make this clear along with the requirements for testing, locations, witnessing, level of independence of testing organisation, etc. The acceptance criteria for all testing shall also be stated.

Information Required Before Supply (CE Marked Products)

RADs shall not set requirements for additional testing or require additional documentation other than the DoP for tests that demonstrate performance of the product in terms of the essential characteristics.

Technical authors shall consider whether the hEN includes supply options or purchaser options. Where the option is not deemed an essential characteristic and therefore will not be included in the DoP, technical authors shall identify the required option(s) and give requirements for demonstration of compliance.

Information Required Before Supply (Non CE Marked Products)

Information required before supply for non CE-marked products is information that needs to demonstrate that a product being proposed by the supplier is acceptable. This may take the form of certified or witnessed testing, the presence of quality marks defining levels of performance and other types of product certification (e.g. BBA HAPAS or Certification Authority for Reinforcing Steels (CARES) certification or declarations).

It shall also be made clear in the product specification what the acceptance criteria are for the product.

Contract Compliance Testing

Contract compliance testing covers the testing and inspection of products once they have been supplied to, or installed by the contractor, to confirm that they meet the requirements of the specification.

Requirements in RADs shall make clear that it is contract compliance testing and inspection of the supplied product.

Technical authors shall be aware that such testing may be challenged by EC if they appear to be *de facto* acceptance testing.

The CPR Standing Committee on Construction (SCC)

The EC is assisted by the Standing Committee on Construction (SCC) and has representatives from the EC, Member States, CEN and EOTA. The SCC meets approximately 3 times a year to discuss issues relating to the functioning of the CPR. Papers are tendered by the EC, CEN, EOTA and Member States for discussion. The UK representative on the SCC is from the Department of Communities and Local Government (DCLG). DCLG consult with National Highways through TSG. Papers tendered relate to all aspects of the CPR covering issues such as harmonised standards and their content, EADs, delegated acts and interpretation of the requirements of the CPR.

Preparatory technical meetings in advance of formal SCC meetings are also held by the EC with broadly the same membership or a core membership reflecting the SCC membership. At these meetings more detailed technical issues are generally discussed ready for papers to be prepared for the relevant formal SCC meeting.

Many of the papers submitted have direct relevance to National Highways' and the other Overseeing Organisations' areas of interest. TSG act as a focal point for SCC papers and will forward papers to National Highways managers responsible for the subject area.

Group managers or appropriate group members are responsible for responding to the papers to TSG by the due date.

These time scales may be challenging but failure to act on this information may ultimately result in additional European legislation or changes to harmonised European standards that have an adverse impact on UK highways.

Where technical authors consider that an EN or hEN is deficient, they should discuss the options for presenting a case to the SCC though DCLG with TSG.

A5 Low Voltage Directive (LVD) and Electromagnetic Compatibility Directive (EMCD) [2014/35/EU & 2014/30/UK]

EU legislation in the electrical sector is important to ensure European-wide harmonisation of essential health and safety requirements for products placed on the market. The LVD and EMCD affect the acceptance criteria to be applied to products that fall within their scope. They do not restrict the specification of performance to the extent of the CPR but products that fall within the scope of these directives shall comply.
Technical authors shall include this compliance as part of the performance requirements.

The LVD ensures that electrical equipment within certain voltage limits (up to 1000v) provides a high level of protection for European citizens and benefits fully from the single market. In February 2014, a new LVD was issued and will come into force on 20 April 2016. The new Directive focuses on the market availability of electrical equipment designed for use within certain voltage limits. For electrical equipment within its scope, the new Directive will cover all health and safety risks, thus ensuring that electrical equipment will be used safely and for its intended purpose.

The EMCD ensures that electrical and electronic equipment does not generate nor is affected by electromagnetic disturbance. In February 2014, a new EMC Directive was issued aligned to the New Legislative Framework and came into force on 20 April 2016.

A6 Radio Equipment Directive (RED) [2014/53/EU]

The RED will come into force on 13 June 2016 and is a revision to the Radio and Telecommunications Terminal Equipment Directive (R&TTE) which established a regulatory framework for placing and putting into service radio and telecommunications terminal equipment on the free market. It covers all equipment that uses the radio frequency spectrum, with a few exceptions. It also covers all terminal equipment attached to public telecommunication networks. Typical products within its scope include radio-terminals (e.g. GSM handsets), other radio equipment (e.g. GSM base stations, car door openers and other short range radio devices) and fixed network terminal equipment (e.g. analogue telephones, ISDN terminals, cable and PC modems).

The RED will streamline rules to simplify application and improve compliance.

A7 Machinery Directive (MD) [2006/42/EC]

The MD is one of the main regulations governing the harmonisation of essential health and safety requirements for machinery (e.g. rotating prism signs and mechanised barriers). It promotes the free movement of machinery within the single market and provides for a high level of protection. It promotes harmonisation through a combination of mandatory health and safety requirements and voluntary harmonised standards. It only applies to products that are to be placed on the EU market for the first time. The MD lists six categories of electrical machinery that are subject to the LVD. For other electrical machinery, the safety objectives of the LVD apply for the electrical risks but the obligations concerning conformity assessment and the placing on the market are governed by the MD.

A8 Mutual Recognition Regulation (MRR) [764/2008/EC]

For products that do not fall within the scope of EU harmonising legislation, the MRR applies. The principle of mutual recognition stems from Regulation EC No 764/2008. It defines the rights and obligations for public authorities and enterprises that wish to market their products in another EU country.

A default clause covering the MRR obligations shall be included in GG 101 Introduction to the DMRB, Clause 104 of the MCHW and TR1000 Introduction to Traffic Systems and Signage Registry.

A9 Technical Standards and Regulations Directive (TSRD) [2015/1535/EU]

The TSRD provides a procedure for the provision of information in the fields of technical standards and regulations and rules on "information society services". It aims to support the principles of free trade and the smooth functioning of the internal market by delivering transparency in respect of national initiatives for the establishment of technical standards or regulations, thus avoiding the creation of new barriers to trade within the EU.

The Directive imposes an obligation upon each Member State to inform the EC and all other Member States of technical regulations and technical standards in draft, before they are adopted in national law (see Section 16 to MDD Part 1 on Notification).

The Directive applies to:

- "Information society services" (i.e. services supplied at a distance by electronic means and at the individual request of a recipient of services).
- All industrially manufactured products.

The scope of this Directive is very broad. It can also include:

- Laws, regulations or administrative provisions.
- Primary legislation and any form of secondary legislation.
- Measures such as administrative circulars, departmental guidelines, advice notes, codes of practice, voluntary agreements, etc.
- Technical specifications or other requirements affecting the consumption of products or services by encouraging compliance with technical specification.

If such documents recommend the use of given specifications or standards and the consequences of following or not following these are such they have a *de facto* obligatory effect, they are notifiable. This means that calling a document a 'manual' or "guidance" does not remove the need for its notification if it contains requirements that make it notifiable.

A10 Public Procurement Directive (PPD) [2014/24/EU]

Current European rules on public procurement date from 2004 and implement the principles and freedoms established by the EU treaties. They aim to make the procedures for awarding public procurement contracts transparent and open to all European companies to enable them to offer their services and products throughout the EU.

In 2014, PPD 2004/18/EC was revised and modernised by Directive 2014/24/EU in order to increase the efficiency of public spending, facilitating in particular the participation of small and medium enterprises (SMEs) in public procurement and to enable procurers to make better use of public procurement in support of common societal goals.

Member States have until April 2016 to transpose the new rules into their national law (except with regard to e-procurement where the deadline is September 2018).

The PPD gives a hierarchy of documents that must be adhered to by public bodies when specifying products and which is therefore relevant to the development of product-related RADs. In ranking order, the hierarchy is:

a. National standards transposing hENs.
b. EADs.
c. Common technical specifications (a technical specification which has been published in the Official Journal of the European Union).
d. International standards published by the International Standards Organisation (ISO).
e. Other technical reference systems established by European Standardisation organisations.
f. National standards and non-harmonised standards (British Standards produced by BSI as the National Standards Body for the UK).
g. National technical approvals (e.g. BBA HAPAS).
h. National technical specifications (e.g. DMRB & MCHW).

The hierarchy means that technical authors cannot use a lower ranking document type if a higher ranking document exists.

References

Ref 1 - CPR FAQs
http://ec.europa.eu/growth/sectors/construction/product-regulation/faq/index_en.htm

Ref 2 - Construction Products Association's *Guidance Note on the Construction Products Regulation*
https://www.constructionproducts.org.uk/publications/technical-and-regulatory/guidance-note-on-the-construction-products-regulation/

Ref 3 - *The Blue Guide* on the implementation of EU product rules
http://ec.europa.eu/DocsRoom/documents/4942/attachments/1/translations/en/renditions/native

Ref 4 - Europa website hEN list for the CPR
http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/construction-products/index_en.htm

Ref 5 - Europa website useful CPR information
http://ec.europa.eu/growth/single-market/european-standards/harmonised-standards/index_en.htm

Ref 6 - EOTA website
http://www.eota.eu/en-GB/content/home/2/185/

Ref 7 - ETA Database
https://ec.europa.eu/growth/sectors/construction/product-regulation/european-assessment_en

Ref 8 - Technical Regulations Information System (TRIS)
http://ec.europa.eu/growth/tools-databases/tris/en/

Annex 3B **Method and performance-based requirements**

B1 Definitions

Requirements can be expressed as performance-based requirements (PBRs) or method-based requirements (MBRs). Performance-based requirements focus on the outcomes or performance of the final artefact. Method-based requirements emphasise methods or processes to achieve the desired outcome.

B2 Distinction between assets and products

Assets or, more generally, constructed facilities are fundamentally different from construction products and materials (e.g. concrete, steel, timber).

The former are big, one-of-a-kind, long lasting and complex structures, which result from a site-specific project-based activity, meaning that the opportunity to build full-scale prototypes is prevented. The latter are generally small and standardised products, which result from a manufacturing process carried out in a highly controlled working environment employing full-scale prototypes.

Moreover, whilst assets are expected to address multiple, diverse and wide-ranging performance objectives, construction products and materials generally fulfil some very specific performance objectives.

B3 Performance-based requirements for products

Product and material standards give classification and required physical and mechanical properties of construction products and materials, and provide a common language to express technical requirements and declare product performance.

It is relatively straightforward to define performance levels for products and materials, as well as to carry out an assessment and verification of ‘constancy of performance’. These aspects are expressly required by the Construction Product Regulation 2011 (CPR) and addressed by current product and material standards.

B4 Performance-based requirements for assets

Due to these intrinsic features of assets presented earlier, the application of the performance-based approach to assets requires a different mind-set for the identification of the performance objectives, the expected performance levels and the criteria and methods for verifying that the final outcomes or outputs meet the agreed performance objectives.

B5 Advantages and disadvantages in method and performance-based requirements

Advantages and disadvantages in using method requirements and performance-based requirements are provided in Tables B5.1 to B5.4.

Generally, the motivation for selecting to use a method requirement or a performance-based requirement varies from document to document, and from requirement to requirement depending on two main factors: (i) number of available methods to verify client's requirements; (ii) the novelty of the requirement.

Table B5.1: Advantages and disadvantages of MR for products

Advantages	Disadvantages
- Method standards are well-established, easily understood, and applicable to a wide range of topic areas. - Requirements are based on materials and methods that have worked in the past, minimizing risk associated with newer or less proven methods	- The contractor has little opportunity to deviate from the product prescribed. - The prescribed product may prevent or discourage the contractor from using the most cost-effective or innovative product to perform the work. - Method standards lack built-in incentives for contractors to provide enhanced performance (e.g. cost, time, quality)

Table B5.2: Advantages and disadvantages of PBR for products

Advantages	Disadvantages
- Aligned with European approach to standardisation - Better quality of product (since it demands industry experience) and long-term durability - More flexibility to select materials, techniques, and procedures to improve the quality or economy, or both, of the end product. - Promoting innovative solutions	- Opportunities for smaller, local manufacturing producers may be reduced

Table B5.3: Advantages and disadvantages of MBR for assets

Advantages	Disadvantages
- Method standards are well-established, easily understood, and applicable to a wide range of topic areas. - The client can exert significant control over the work - Requirements are based on methods that have worked in the past, minimizing risk associated with newer or less proven methods.	- The contractor has little opportunity to deviate from the standard and, provided that the standard is met, is not responsible for performance deficiencies of the end product. - The prescribed method requirement may prevent or discourage the contractor from using the most cost-effective or innovative solution. - Method standards lack built-in incentives for contractors to provide enhanced performance (e.g. cost, time, quality).

Table B5.4: Advantages and disadvantages of PBR for assets

Advantages	Disadvantages
- Better quality of the final constructed facility (since it demands industry experience) and long-term durability - More flexibility to select techniques and procedures to improve the quality or economy, or both, of the end product.	- The client can exert less control over the work - Opportunities for smaller, local firms may be reduced - Challenge in identifying all of the parameters critical to performance and establishing related thresholds

- Promoting innovative solutions - Accelerating construction	- Need to clearly define what is meant by performance standards - Increase in cost due to risk transfer - Difficult to enforce performance particularly where there are complex interfaces with split liabilities - Difficult to enforce performance particularly when dealing with long term assets - Maintenance issues - Increased industry costs to control application of performance standards

B6 Challenges in 'pure' performance-based requirements

Developing a pure performance-based requirement (i.e. high level requirement) brings about several challenges including:

- Establishment of liability for a defect:
  - Design interfaces
  - Multiple design objectives
  - Influence of maintenance on performance
- Means of recourse:
  - Insurances
  - Warranties
  - Ability to enforce means of recourse, particularly some years after the design is completed

B7 'Mixed' performance-based requirements

Current industry best practice for performance-based design suggests that:

- Design requirements should, where possible, be associated with a performance level and should be clear on the performance expectations the requirement is seeking to address (without placing unreasonable liabilities on designers);
- Typically, a method should be provided as a means to meet the requirement, and the method should often be presented as advice (i.e. a recommendation or permissible approach).

To overcome the challenges in pure performance-based requirements and considering current industry best practice, the performance requirements (or design objectives) may be accompanied by performance criteria and related limiting or threshold values. For the purpose of this Manual, such requirements are called 'mixed' performance-based requirements. A 'mixed' performance-based requirement provides high-level performance requirement with advisory method to satisfy the requirement.

Annex 3C **Content of change log** (DMRB, MCHW and NAA)

Efficiency schedule

In the efficiency schedule of the change log, the efficiency gained deleting text shall be clarified (that efficiency gained by changing existing clauses or introducing new clauses is covered in the background document).

Examples include: reducing the number of departures in the future by deleting specific clauses; less resources needed for maintenance of the document as reduced content; etc.

Changes made to the original text

1) Please classify the change made as either:
   - deleted;
   - technical update
   - editorial update
   - technical and editorial update

2) Please summarise the reason for the change made in the change log. Options include:

   - Content kept as it is
   - Content moved to another clause in the same document (clarify in which section)
   - Content merged
   - Content that should be moved to another document
   - Overseeing Organisation-specific content
   - Content deleted from the DMRB/MCHW suite (for example because obsolete, duplication, Overseeing Organisation-specific, moved to industry, etc.)
   - Content rephrased to adjust the verbal form
   - Content changed technically
   - Updated reference
   - Content shared with other asset owners

3) When the content is moved internally (i.e. in the document under consideration) or should be moved to an external document, please clarify the final location.

NOTE 1 *Where a published standard has not yet been drafted and published in CARS, the change log function in CARS allows you to link the clause to the newly drafted document as the change log record.*

NOTE 2 *Where a document has been drafted and published in CARS at least once, the clause change summary functionality in CARS is automatically generated to highlight the change between the current published clause and proposed clause. The background commentary against the clause is included in the clause change summary output to give consultees details of why the clause has changed or a new clause has been added. See Section 11 of MDD part 1 for further details.*

Annex 3D **Content of the background document** (DMRB, MCHW and NAA)

Efficiency schedule

In the efficiency schedule of background document, the efficiency gained by changing existing clauses or introducing new clauses shall be clarified. Efficiency shall be evaluated in terms of economy, productivity, effectiveness.

Examples include:

- *Economy*: reducing the number of departures in the future; less resources needed for maintenance of the document (reduced need for review); technical changes that enable more economic solutions to be developed; etc.
- *Productivity*: better use of the document; technical changes that enable a more productive way of working; innovation supported by providing more performance-based requirements; innovation supported by making better use of cross references to external publications; clearer linkage between the document and the related advice note; clearer linkage between the document and the related IAN; etc.
- *Effectiveness*: technical changes that enable better solutions to be developed; content aligned to the changes to the Overseeing Organisations' strategic approach, needs & objectives; content better aligned to corporate and social responsibility (health and safety, sustainable development and good design, equality & diversity); content reflecting operational practice; etc.

Where background to existing clauses is not known, this shall be clarified.

Commentary shall be provided on the background to the clauses contained in the new RAD.

A non-exhaustive list of topics to include in the commentary:

- The source of the text (i.e. where the text was taken)
- Technical background to the content
- Specific references
- Notes on the scope of application of the content (including limitations)
- Information on how consensus on the content was achieved (this may include a discussion on the challenges emerged during the development of the clause, contrasting views, etc.

Revision history

Version	Date	Description	Author
6.4	October 2023	High-level narrative term added to Terms and definitions. High-level narrative added to deliverables in section 4. Section 4, Table 1, health, and safety matters updated to advise ALARP can no longer be used and is replaced by SFAIRP. Section 5 requirement for where the content of a DMRB document applies to one Overseeing Organisation only expanded to include examples of how to structure the NAAs to indicate the document does not apply. Section 10 withdraw without replacement. Clarification that a CHE memo may be appropriate to announce a withdrawal, and this is no longer a requirement.	NH/WSP
6.3	October 2022	Technical Assurance and Governance Group (TAGG) renamed to Technical Standards Group (TSG). All references to email address for Standards Enquiries amended from old Highways England email address. Section 4 Approach to document development – new requirement to complete commercial impact assessment. Section 6 Develop new RADs - amendments to clause 6.9, 6.12 and new clause 6.13.	NH/WSP
6.2	February 2022	Clause on document review form added to deliverables in section 4	NH/WSP
6.1	November 2021	Highways England changed to National Highways throughout Further details added to section 4 about clause change summary New sub sections added to section 7 under ‘Specific rules for DMRB and MCHW documents’ - Transition from current Volume 3 drawings to figures,	NH/WSP

		location of content and governance of figures Drafting note in Annex 2A on withdrawal from EU updated	
6.0	March 2021	Terms, definitions, and abbreviations updated. Document owner/author is now technical author and Technical Project Board is now Technical Standards Committee. Reference to impact assessment and consultation reports added to section 4. Additional requirements added to section 5, Table 1 - Things to do to develop clear RADs and Table 2 – Non-exhaustive list of vague terms to avoid. Clause on hyperlinks in section 5 expanded for clarity. Reference to 'transfer content to MCHW' form in Jira deleted from section 7 as MCHW documents can now be drafted. Relaxation requirements updated in section 7. New clause added to section 12 to clarify that performance requirements apply to both DMRB and MCHW documents. Section 14 updated to include carbon management and reference to latest impact assessment report.	WSP/HE
5.1	October 2019	Update to section 4 deliverables and section 14 sustainability. Guidance on relaxations added to conditional expressions information in section 5. Additional requirements and guidance on referencing added to cross referencing information in section 5.	WSP/HE
5.0	November 2018	The Manual has been restructured into three parts in recognition of different audiences and feedback received by users: • Part 1 on governance of document development, relevant to those	WSP

		involved in the governance process. • New Part 2 on document layout and clause style, relevant to CARS updates. • New Part 3 on drafting rules, relevant to Document Authors. Key updates include: o document development plan made mandatory; o emphasis on adopting enhanced ways of working and clarification of what this entails; o distinction between: ▪ development of a new RAD, ▪ update of an existing RAD, ▪ 'transfer to industry' option, ▪ collaborative development with other infrastructure clients, ▪ presentation of research outcomes, ▪ withdrawal of RADs o additional rules on national application annexes; o additional rules on the interaction between DMRB and ADMM (Highways England only).	
4.2	March 2018	No changes have been made to requirements contained in MDD 4.1. This version provides additional requirements and guidance, and addresses feedback and comments received.	WSP
4.1	September 2017	No changes have been made to requirements contained in MDD 4.0. This version provides additional requirements and guidance, and addresses feedback and comments received.	WSP
4.0	April 2017	The entire Manual is reviewed to reflect the style of the new DMRB drafting rules. The Manual is developed into two separate Parts to acknowledge their different audiences.	WSP Parsons Brinckerhoff
3.0	January 2017	Restructure of the Manual into two parts. Part 2 on drafting rules reviewed in a pilot project.	WSP Parsons Brinckerhoff

		Revisions and changes made throughout including: new drafting rules, new Annexes, new concepts such as content specialist, National Application Annexes, performance-based requirements for assets.	
2.2	October 2015	Revisions made throughout to make suitable for use by a wider audience. References to Peer Review Board amended to Technical Project Board. Minor changes throughout.	CH2M
2.1	1 June 2015	Revisions to Section 6 for Cost Impact Toolkit. Addition of Annex B Cost Impact Identification for Document Owners. Revisions to Section 10.	CH2M
2.0	7 May 2015	Revisions for CDM 2015. Name change to Highways England throughout. New Section 3.0 Roles and Responsibilities added. New Section 15 Technical Project Board added. New Annex A Drafting Content of RADs added. Minor changes throughout.	CH2M