Digital MCHW

Training for authoring
Part 0: Pre-reading material

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Purpose of these slides

Provide introductory material on the future MCHW including:

1. Need for the MCHW update work
2. Vision and practical implications for the future MCHW
3. Content, structure and presentation of the future MCHW
4. Key dates

Key points from this introductory material will be refreshed during the 4-hour training session.

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Need for the MCHW update work

Why we will be updating the MCHW

- It is part of Highways England's business strategy.

- Jim O'Sullivan and Mike Wilson have both described it as 'good business' and something we should be doing as business as usual building upon the success of the DMRB update.

Other key drivers for change

- Age and inconsistent format
- Making it easier to keep content up to date
- Unclear distinction between construction and design requirements
- Alignment between the new DMRB and MCHW can be improved
- Our contracts and our relationship with our supply chain are continuing to evolve
- To be digital ready – enhanced compatibility with BIM / support to our vision for digital roads
- Wider changes in design and construction methods affecting how construction works are specified

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Consultation with key stakeholders

- Conducted over 5 months in 2018
- 106 responses were received from 67 organisations including contractors, design organisations, product manufactures, other transport organisations, software developers
- As a result, we developed one high-level recommendation and 15 specific recommendations covered over the following slides

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High-level recommendation

The MCHW should be updated to enhance its usability, structure, content and applicability for modern contract forms and construction

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The future MCHW will…

PURPOSE, SCOPE AND CONTENT
1. …continue to set out the requirements to be used for the United Kingdom motorway and all-purpose trunk road network.
2. …be compatible with the future DMRB.
3. …have content related to conditions of contract removed.
4. …be and remain up-to-date.
5. …clearly define requirements to be fulfilled by constructors.
FORMAT
6. …will provide clear and easier to use instructions to contract compilers.
7. …enable national variation of MCHW clauses by Devolved Administrations or Highways England by introducing clauses in the main text.
8. …have a consistent style and format, and be intuitive to use.
9. …be future-proofed for advances in information technology.
ENABLING FUTURE (LONGER TERM) EFFICIENCIES
10. …be compatible with future asset information strategies and digital design, construction, operation and maintenance of roads.
11. …seek to implement more content developed in partnership with others and to refer to content published by other reputable bodies.
12. …not inhibit and will seek to support trends in construction.
13. …be contract neutral and compatible with conditions of contract used by Devolved Administrations and Highways England.
PROGRAMME DELIVERY
14. The timing of work on the update of the future MCHW will not overlap work on the DMRB update, whilst seeking to achieve efficiencies available from continuity of resourcing.
15. Create a community of document owners, supported by content specialists, to strengthen collective commitment to programme, derive efficiencies and ensure high quality drafting.

Vision and practical implications for the future MCHW

Vision

The future MCHW will provide
clear and unambiguous requirements and instructions,
compatible with modern contract forms and
future construction practices

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Practical implications

1. MCHW developed and hosted digitally enabling machine readability
2. Volumes 1 and 2 fully updated and with a new look - new drafting rules to develop clear requirements for constructors and instructions for specifiers
3. Volume 3 removed, with drawings fully updated and moved to relevant DMRB and SHW documents – archived versions of old drawings will be made available
4. Volume 4 fully updated by Commercial team
5. Volume 5 removed, relevant content moved to Volumes 1, 2, 4
6. Volume 6 removed, relevant content moved to DMRB and H&S docs
7. Conditions of contract content removed – clauses to be contract neutral
8. Introduction of nationally determined requirements / sections – vision on final published documents to be agreed
9. Moving towards full compatibility between MCHW and DMRB

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Key benefits

- ✓ Greater efficiency in project delivery
- ✓ Greater efficiency in the production of contract documentation
- ✓ Greater efficiency in the production and maintenance of the MCHW
- ✓ Fewer compensation events
- ✓ Fewer Departures from Standards
- ✓ Improved construction quality
- ✓ Enhanced innovation

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Content, structure and presentation of the future MCHW

New matrix of technical requirements

		Part (discipline)								
		G	**L**	**C** (Civil Engineering)					**T** (Technology)	
		General Principles & Scheme Governance	Sustainability & Environment	Road Layout	Pavement	Highway Structures & Bridges	Drainage	Geotechnics	Control & Communications Technology	Road Lighting
Volume (life-cycle stage)		100 - 999	100 - 999	100 - 199	200 - 299	300 - 499	500 - 599	600 - 699	100 - 499	500 - 999
General Information	**G**	DMRB review programme – RIS 1								
Appraisal	**A**									
Design	**D**									
Contract preparation	**P**	NEW ROW: Instruction for specifiers documents – RIS 2								
Construction(1)	**C**	Specification for Highways Works documents – RIS 2								
Maintenance & Operation(2)	**M**	DMRB review programme – RIS 1								
Inspection & Assessment	**S**									
Disposal	**Z**									

Current MCHW

Volume 0	Volume 1	Volume 2	Volume 3	Volume 4	Volume 5	Volume 6
Manual Contract Document for Major Works and Implementation Requirements	Specification for Highways Works	Notes for guidance	Highway Construction Details	Bill of quantities	Contract Documents for Specialist Activities	Requirements and advice relating to H&S legislation

Current MCHW

Volume 0
Manual Contract Document for Major Works and Implementation Requirements

Volume 1
Specification for Highways Works

Volume 2
Notes for guidance

Volume 3
Highway Construction Details

Volume 4
Bill of quantities

Volume 5
Contract Documents for Specialist Activities

Volume 6
Requirements and advice relating to H&S legislation

Constructor requirements

Instructions for the specifier

Design content

Method of measurement

H&S documents

'Design' row

'Construction' row

New 'Contract preparation' row

Location TBC

Future MCHW

Specification for Highways Works (SHW) documents

- Introductory content
- Core Requirements
- Nationally determined requirements / sections

Instructions for Specifier (IfS) documents

- Introductory content
- Core Instructions
- Nationally determined requirements / sections
- Sample appendices

Bill of quantities

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Terminology

Current MCHW	Future MCHW
‘Specification for Highways Works’ (SHW) series	‘Specification for Highways Works’ (SHW) documents
Requirements for constructors (in SHW)	Constructor requirements (in SHW)
‘Notes for Guidance’ (NfG) documents	‘Instructions for Specifier’ (IfS) documents
Guidance for contract compiler (in NfG)	As relevant: Design requirements / advice (in DMRB) Specifier instructions (in IfS) Constructor requirements (in SHW)
Contract specific appendixes (in NfG)	Works specific inputs (WSI)

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Old content and presentation of SHW and NfG (1/3)

SERIES 900
ROAD PAVEMENTS – BITUMINOUS BOUND MATERIALS

Contents

SERIES NG 900
ROAD PAVEMENTS – BITUMINOUS BOUND MATERIALS

Contents

In this case the titles of the sections match up between SHW and related NfG documents.

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Old content and presentation of SHW and NfG (2/3)

900 (05/18) **General**

1 (05/18) This Series is part of the Specification for Highway Works. Whilst this Series is particularly relevant to the subject matter in its title it must be read in conjunction with the general requirements in Series 000 and 100 and with all other Series relevant to the specification for the particular works to be undertaken.

901 (05/18) **Bituminous Pavement Mixtures**

(05/18) **General**

1 (05/18) This Clause gives general requirements for the properties of the aggregates and bitumen used in plant-produced bituminous mixtures. These requirements apply to all plant produced bituminous mixtures unless otherwise specified in contract specific Appendix 7/1 or where other requirements are given in specific Clauses in this Series.

2 (05/18) Bituminous mixtures shall be laid by organisations registered to and operating in compliance with the 'Sector Scheme 16 for the Laying of Asphalt Mixes' listed in Appendix A. All mixtures supplied in accordance with BS EN 13108 shall be CE marked and the Contractor shall submit the declaration of performance which shall demonstrate that the mixture provides the performance required by the specification.

(05/18) **Aggregates for Bituminous Mixtures**

3 (05/18) Natural, recycled unbound and manufactured (artificial) aggregates shall be clean, hard and durable and shall comply with BS EN 13043:2002 and be CE marked and have a declared performance which demonstrates that the aggregate meets the requirements of the specification. Where recycled coarse aggregate or recycled concrete aggregate is used in bituminous mixtures, it shall have been tested in accordance with Clause 710 and the content of other materials (Class X) including wood, plastic and metal shall not exceed 1% by mass. Reclaimed asphalt shall comply with Clause 902.

4 (05/18) The use of aggregate derived as a by-product during the extraction of china clay is permitted. It shall comply with the requirements of this Clause, BS EN 13043:2002 and the examples of the relevant annex of BSI PD 6691.

5 (05/18) The use of crushed slate aggregate is permitted in base and binder course layers. It shall comply with the requirements of this Clause, BS EN 13043:2002 and the examples of the relevant annex of BSI PD 6691, except for the flakiness category, which shall be subject to prior approval by the Overseeing Organisation. Mixtures of crushed slate aggregate with coarse aggregate of a different geological type shall not be permitted.

(05/18) **Resistance to Fragmentation (Hardness)**

NG 900 (05/18) **General**

1 (05/18) Advice on the design, construction and maintenance of bituminous r
for Roads and Bridges (DMRB), Volume 7.

NG 901 (05/18) **Bituminous Pavement Mixtures**

(05/18) **General**

1 (05/18) Current pavement design methods may give the Contractor a choice
extent of this choice should be stated in contract specific Appendix 7/1 and the a
reference to the Specification Clause numbers. Bituminous mixture specifications are given in the relevant parts of BS EN 13108 with guidance on the requirements to be selected in the UK in BSI PD6691.

2 (05/18) Requirements included in contract specific Appendix 7/1 may include penetration reference of binder and aggregate properties such as polished stone value, aggregate abrasion value, resistance to fragmentation, resistance to freezing and thawing, and water absorption as specified in BS EN 13043.

3 (05/18) Sub-Clause 2 details the Sector Scheme which is mandatory for laying of bituminous mixtures. The requirements for bituminous mixtures to be in accordance with standards harmonised under the Construction Products Regulation and be CE marked means that the manufacturers are obliged to make a declaration of performance for each mixture. The declaration of performance should contain the performance information to confirm that the mixture meets the requirements stated in the specification including those contained in the contract specific Appendices. The Series 900 Clauses and Clause 104 require the declarations to be submitted in order to demonstrate the performance characteristics of the mixtures. The mixture components, bitumen and aggregate, are also required to be CE marked under the regulation and so in some instances the Contractor is also obliged to submit the declarations of performance for components.

(05/18) **Aggregates for Bituminous Mixtures**

4 (05/18) The use of natural, recovered unbound and artificial aggregates is permitted. In this context, recovered unbound aggregates are natural aggregates recovered from a previous use in an unbound form which satisfy the requirements of Clause 901.

5 (05/18) Guidance on the use of BS EN 13043 can be found in PD 6682-2.

(05/18) **Resistance to Fragmentation (Hardness)**

6 (05/18) Regional knowledge may indicate that particular aggregates with higher levels of Los Angeles

In this case the sub-titles match up between SHW and related NfG documents.

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Old content and presentation of SHW and NfG (3/3)

Volume 1
Specification for Highway Works

WATERPROOFING FOR CC

2001 (05/01) General

1 The surface finish for new bridge decks between parapet upstands and to top of buried structures to be waterproofed shall be Class U4 finish in accordance with sub-Clause 1708.4.

2 Existing waterproofing systems to bridge decks between parapet upstands are to be repaired or replaced in accordance with Clause 2008.

2002 Protection of Bridge Deck Waterproofing During Construction

1 (05/01) On any structure, providing no damage results, plant and equipment all fitted only with rubber tyres may stand or travel on permitted waterproofing systems solely for the purposes of laying an additional protective layer or surfacing course on that structure.

Rollers shall not be permitted to stand or travel directly on the waterproofing system.

Where it is necessary for plant, equipment or traffic to

NG 2001 General

1 The most opportune periods for installing waterproofing systems are the spring, summer and autumn when climatic conditions are most favourable.

2 Specification requirements for restrictions on curing liquids, compounds and membranes are given in sub-Clause 1710.5.

3 The use of ventilating layers, partial bonding or bond breakers is not permitted in the Specification as they provide an easy passage for water to pass under the membrane. The pumping action produced by the passage of vehicle wheels exacerbates the problem and leads rapidly to the general failure of the adhesion and disruption of the surfacing.

4 Fillets are generally formed in sharp internal angles to ensure the fitting and shaping of prefabricated sheet and minimum thickness of sprayed membrane in the angle.

Outgassing

5 (05/01) The design of many bridge decks includes voids, which contain air, and air may be held within the concrete itself. This contained air can move in and out of voids with temperature and barometric pressure

7 (05/01) Under the conditi
outgassing it has been found
membranes are most suscepti
thin slower gelling membran
blow holing.

NG 2002 Protection of B
Waterproofing During Construction

1 Before rubber tyred plant and equipment are allowed to travel on bridge deck waterproofing, it should be ensured that the surface is and remains, free of all loose materials and is stable enough to withstand traction forces.

NG 2003 Materials for Waterproofing Concrete Bridge Decks

Permitted Waterproofing Systems

1 (05/01) As soon as possible after the Contract has been awarded, it should be ensured that the Contractor provides the BBA (British Board of Agrément) Roads and Bridges Agrément Certificate.

2 (05/01) Should the Overseeing Organisation call for

In this case the sub-titles do not match up between SHW and related NfG documents.

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New content and presentation of SHW

4	Element
4.1	Elements shall be compliant with BS 2210.
4.2	The class shall be as stated in the works specific inputs.
4.3	The height of the element shall be a minimum of 500mm.

- SHW requirements will be split out.
- SHW requirements will only cover:
  1. products;
  2. materials;
  3. activities related to products and materials including:
     - construction activities required to ensure that products and materials are correctly installed (installation/workmanship requirements);
     - verification (including testing and inspection) to prove that products and materials are acceptable;
     - documentation to prove that other requirements have been carried out.

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New content and presentation of NfG (now IfS)

1	Element	
1.1	Elements shall be compliant with BS 2210.	Constructor requirements
1.2	The class shall be as stated in the works specific inputs.	
SI 1.2	Insert **X**, **Y** or **Z** to represent the class	Specifier instruction
1.3	The height of the element shall be a minimum of 500mm.	

- The Notes for Guidance will change significantly in terms of scope and structure.
- For ease of use by specifiers, Instructions for Specifiers documents shall be published with both:
  - the default set of constructor requirements of the SHW and,
  - the specifier instructions on providing the required works specific inputs related to the constructor requirements.
- Specifier Instructions aligned with the SHW Requirements and only included where SHW requirements refers to Works Specific Inputs.

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Key dates

Timeline

- February 2021: **programme** shared with the Devolved Administrations
- 24 & 29 March 2021: **training** for Volumes 1 and 2 authoring
- From April 2021: **start authoring**
- From April 2021: **monthly MCHW progress calls** with the Devolved Administrations' Heads of Standards
- August 2023: **end authoring**
- December 2023: final **CHE approvals**
- January – June 2024: last **notifications** to EC
- 2024: **Big bang publication**
- After publication: 5-year document review cycle

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Interim changes to MCHW

Q. What if you want to make a change to your document(s) prior to 2024 (when all documents are expected to be published)? For example due to:

- a technical update
- industry or supply chain feedback
- changes in national legislation
- changes to external standards

A. TAGG are developing criteria by which changes / amendments will be accepted to current documents. The MCHW needs to work contractually for the next three years. For any specific query, please speak to TAGG.

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Closing remarks

Summary of key points

1. Our vision for the future MCHW is to provide clear and unambiguous requirements and instructions, compatible with modern contract forms and future construction practices.
2. MCHW developed and hosted digitally enabling machine readability.
3. Volumes 1, 2 and 3 fully updated and with a new look.
4. Volume 5 and 6 removed, relevant content moved.
5. Introduction of nationally determined requirements / sections.
6. New content, structure and presentation of the MCHW.
7. SHW and IfS will be located in the DMRB matrix under “construction” and new “contract preparation” rows.
8. IfS will be authored and presented in line with SHW requirements for ease of use.

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Key contacts

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Thank you