Design Manual for Roads and Bridges

Pavement
Maintenance & Operation

CM 231
Pavement surface repairs

(formerly HD 31/94, HD 32/16)

Revision 0

Summary
This document provides guidance on methods to be used for minor repairs of both flexible and rigid pavements.

Application by Overseeing Organisations
Any specific requirements for Overseeing Organisations alternative or supplementary to those given in this document are given in National Application Annexes to this document.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

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Contents

Release notes 2

Foreword 3
Publishing information . . . 3
Contractual and legal considerations . . . 3

Introduction 4
Background . . . 4
Assumptions made in the preparation of this document . . . 4
Mutual Recognition . . . 4

Abbreviations 5

1. Scope 6
Aspects covered . . . 6
Implementation . . . 6
Use of GG 101 . . . 6

2. Crack repairs 7

3. Surface repairs 8
Bituminous surfacing . . . 8
Concrete surfacing . . . 8

4. Normative references 9

5. Informative references 10

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Release notes

Version	Date	Details of amendments
0	Mar 2020	CM 231 replaces HD 31/94 and HD 32/16. This full document has been re-written to make it compliant with the new Highways England drafting rules.

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Foreword

Publishing information

This document is published by Highways England.

This document, along with CD 227 [Ref 1.N], supersedes parts of HD 31/94 and HD 32/16, which are withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

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Introduction

Background

The timely repair of small localised pavement defects plays an important part in providing safe roads and reliable journeys for the road user. Regular maintenance is required to protect the integrity of the overall pavement structure and to ensure the safety of the road user. Depending on the environmental conditions, including traffic loading and the type of road pavement, an untreated defect can deteriorate quickly and present a hazard to road users.

This document provides requirements and associated advice on methods to be used for minor repairs of both flexible and rigid pavement. It covers minor defects such as patching, crack and joint repairs. Trench reinstatements, where required, are covered by the Specification for the Reinstatement of Openings in Highways SROH [Ref 1.I] and specifications in Series 700 of the MCHW [Ref 3.N].

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 2.N] apply to this document.

Mutual Recognition

Where there is a requirement in this document for compliance with any part of a "British Standard" or other technical specification, that requirement may be met by compliance with the Mutual Recognition clause in GG 101 [Ref 2.N].

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Abbreviations

Abbreviation

Abbreviation	Definition
CRCP	Continuously reinforced concrete pavement
HRA	Hot rolled asphalt
msa	Million standard axles
NRSWA	New Roads and Street Works Act

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1. Scope

Aspects covered

1.1 The requirements and associated advice on methods in this document shall be used for minor repairs on both flexible and rigid pavements.

1.2 To assess the need for more substantive maintenance treatments, e.g. retexturing, resurfacing and reconstruction, reference shall be made to the Pavement maintenance assessment procedure CS 230 [Ref 4.N] and Design for pavement maintenance CD 227 [Ref 1.N].

Implementation

1.3 This document shall be implemented forthwith on all schemes involving the maintenance of pavement surfaces on the Overseeing Organisations' motorway and all-purpose truck roads according to the implementation requirements of GG 101 [Ref 2.N].

Use of GG 101

1.4 The requirements contained in GG 101 [Ref 2.N] shall be followed in respect of activities covered by this document.

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2. Crack repairs

2.1 Crack repairs using over-banding and inlaid crack sealing systems shall be specified in accordance with Clause 711 of the MCHW [Ref 3.N].

2.1.1 Crack sealing systems may be classified as follows:

1) simple overbanding systems;
2) fill and overbanding systems; and
3) inlaid sealing systems.

NOTE *Crack sealing systems comprise a range of materials, including cold applied thermoset resins, hot applied thermoplastic resins and bituminous materials. They are commonly used to:*

1) prevent water ingress and subsequent damage to pavements exhibiting cracks;
2) repair poorly constructed or open longitudinal joints; and
3) maintain profile and skid resistance of the pavement surface.

2.1.2 Inlaid crack sealing systems are classified as either Grade F (flexible) or Grade H (high modulus) and Grade F should be used where movement at a crack is anticipated.

NOTE *For example, movement can be anticipated at a transverse crack in an asphalt overlay to a jointed concrete pavement.*

2.1.3 Grade H (high modulus) should be used in circumstances where cracks do not penetrate through the pavement structure and movement is unlikely to occur, or where small patches in the wheel tracks are required.

NOTE *More information on repairing reflective cracks in flexible pavements with hydraulic bound base is given in CD 227 [Ref 1.N].*

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3. Surface repairs

Bituminous surfacing

3.1 Repairs to pavement layers over a relatively small area shall be specified in accordance with Clause 946 of the MCHW [Ref 3.N].

3.2 When undertaking a local repair, materials shall be specified to be consistent with, and compatible to, the surrounding existing materials.

NOTE *For example, for permanent repairs, hot rolled asphalt (HRA) can only be repaired with HRA specified in accordance with Clause 943 of the MCHW [Ref 3.N].*

3.3 Where there are circumstances when an emergency pot hole repair or carriageway patch is required, the use of a pre-bagged proprietary material or processes conforming to Sub-clauses 946.15 to 946.16 MCHW [Ref 3.N] is permitted, on the condition that a subsequent permanent repair shall be undertaken as part of programmed maintenance.

NOTE *Defect definitions and time periods for temporary and permanent repairs are dependent on individual management and maintenance contracts. The severity of the defect can be related to:*

1) the environmental conditions;

2) traffic loading;

3) road pavement structure and the materials used; and

4) size of and location of defect.

3.3.1 Where the presence of detector loops have necessitated the requirement for a local repair, the existing surface course should be planed out, and loops installed in the pavement layer directly beneath, before the repair is carried out.

Concrete surfacing

3.4 Thin bonded repairs to concrete pavements shall be specified in accordance with Clause 1032 of the MCHW [Ref 3.N].

NOTE 1 *Thin bonded repairs can be used for repairing shallow spalling at joints or the edge of slabs and for addressing surface scaling, aggregate pop out and surface irregularity.*

NOTE 2 *Non-shrink concretes are preferred for thin bonded patch repairs since some high strength concretes used for patching can be affected by high temperatures soon after placing.*

3.4.1 Maintenance to continuously reinforced concrete pavement (CRCP) should be carried out to extend the service life which includes crack sealing, repair to spalled cracks, grouting to stabilise vertical slab movement.

3.5 Deep spalling and 'punchout' to CRCP shall be repaired using full depth repair in accordance with CD 227 [Ref 1.N].

3.5.1 Maintenance works to CRCP should be planned to be carried out during Spring and Autumn.

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4. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Highways England. CD 227, 'Design for pavement maintenance'
Ref 2.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 3.N	Highways England. MCHW, 'Manual of Contract Documents for Highway Works'
Ref 4.N	Highways England. CS 230, 'Pavement maintenance assessment procedure'

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5. Informative references

The following documents are informative references for this document and provide supporting information.

Ref 1.I	HAUC. SROH, 'Specification for the Reinstatement of Openings in Highways.'

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