UK ROADS LIAISON GROUP

Department for Transport

Design & Maintenance Guidance for Local Authority Roads

Departures from Standards: Procedures for Local Highway Authorities

October 2011

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Contents

Foreword

Public budgets for highway works are constantly under pressure. At the time of writing, the UK is recovering from one of the deepest recessions in memory, and highway authorities and their designers are having to innovate and deliver more for less.

Published design standards offer benefits but also potential constraints and progressive authorities may seek to work beyond the limits of standards in delivering “more for less”. This is to be welcomed, but it is important that the correct governance procedures are in place so that risks can be well managed and value for money maximised.

In deciding upon the appropriateness of particular approaches, highway authorities are expected to consider the scale of the highway works and the commensurate effort to be applied.

This Guidance document offers pragmatic methods for preparing Departures from Standards and associated policies. A new simple proforma is also included and is commended to highway authorities.

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1. Executive Summary

It is only trunk roads that are required to be designed according to the Design Manual for Roads and Bridges and the Specification for Highway Works. For all other roads the decisions on the choice of standards and their incorporation into designs remain in the hands of local highway authorities.

This document has been written to assist highway authorities assessing Departures from Standards and designers preparing submissions. It has also been prepared to assist highway authorities that are developing or updating Departure from Standards policies and procedures.

This document may be applied by non-trunk highway authorities across the UK, except in Northern Ireland where there is a unified Overseeing Organisation for trunk and non-trunk roads that currently uses a common Departures from Standard system and application form.

The use of a Departures system should be appropriate and be designed to avoid the creation of a burdensome and bureaucratic process. Instead the process should be viewed as an opportunity to simply and effectively record the best judgements of the professionals involved in the delivery of a highway scheme.

The objectives of this Guidance are:

- To enable a highway authority to establish a policy and procedures for Departures From Standard
- To provide a simple pro-forma for recording and determining Departures from Standard
- To provide basic tools for risk assessment
- To define the respective roles and responsibilities of the Design Organisation and highway authority staff.

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2. Definitions

The following definitions are used in this document:

Aspects not covered by Declared Standards
Design features or methods not included in the Declared Standards and thus requiring approval as Departures.

ALARP
The duty under Health and Safety legislation to reduce risks so that they are "As Low As Reasonably Practicable". This relates to those that work on the road only.

CDM Regulations
The Construction (Design and Management) Regulations.

Declared Standards
The standards and specifications containing Mandatory Requirements and used by the highway authority and stipulated as such in a standards management system, other policy documents, contracts (e.g. "Employers Requirements") or a design brief or design statement.

Departure or **Departure from Standard(s)**
A non-compliance with a Mandatory Requirement of a Declared Standard.

Design Manual for Roads & Bridges (DMRB)
The Stationery Office publication containing current standards, advice notes and other guidance documents relating to the design, maintenance, operation and improvement of motorways and trunk roads.

Design Organisation
Any organisation, including in-house local authority resources, undertaking the design of works that affect any part of the highway network. Such works include private and public developments.

Design statement
An optional document that outlines the design philosophy and the standards to be adopted. This document is normally prepared by the Design Organisation and agreed by the highway authority.

Determination
The highway authority's formal decision to approve, approve with comments or reject an application[1] for a Departure from Standard.

HASWA
The Health and Safety at Work Act.

Hazard
Something with the potential to cause harm.

[1] Throughout this document "application" and "submission" are used as interchangeable terminology

Mandatory Requirement
A statement in a standard that is “black-boxed” and/or associated with the words “must”, “must not”, “shall” or “shall not”

MHSW Regulations
The Management of Health and Safety at Work Regulations.

Project Manager
The person within the highway authority responsible for overseeing the design and the designer.

Relaxation
A permitted variation from the Mandatory Requirement of a Declared Standard, as set out in the Declared Standard or other policy document.

3. Introduction

3.1 PURPOSE OF THIS DOCUMENT

3.1.1 This UKRLG Guidance document has been prepared for use by local highway authorities[2]. This document has been written for highway authorities assessing Departures from Standards and designers preparing submissions. It has also been prepared to assist highway authorities that are developing or updating Departure from Standards policies and procedures.

This Guidance document may be applied by non-trunk highway authorities across the UK, except in Northern Ireland where there is a unified Overseeing Organisation for trunk and non-trunk roads that currently use common Departures from Standard system and application form[3].

3.2 APPROPRIATE EFFORT

3.2.1 The use of a Departures system should be applied pragmatically and be designed to avoid the creation of a burdensome and bureaucratic process. Instead the process should be viewed as an opportunity to simply and effectively record the best judgements of the professionals involved in the delivery of a highway scheme. Rarely does the delivery of a new highway or improvement scheme result in a worse overall outcome than the pre-scheme situation and this should be borne in mind when considering Departures.

3.2.2 This Guidance outlines a robust arrangement whereby Departures from Standards are prepared and submitted by a Design Organisation and approved (determined) by the highway authority. This suggested approach does not prevent consideration of alternative approaches by highway authorities. Other pragmatic approaches can be taken, including a reduced input from the highway authority[4]. Whatever the chosen method[5] it is beneficial if the policy is articulated in writing so that all parties are clear what is expected of them.

3.2.3 The depth of assessment carried out should be proportional to the scale of the project and the likely risks.

3.2.4 The Guidance set out best practice that Design Organisations should already be following and it is not anticipated that there should be any design cost implications arising from its implementation.

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[2] The terms “highway authority” and “highway authorities” have been used throughout this document. In Scotland the terms “road authority” and “road authorities” are applicable.

[3] See http://www.roadsni.gov.uk/index/publications/publications-specific_interest_publications/publications-specific-departures_from_standard.htm

[4] For example the highway authority may consider it unnecessary to review the detailed justification of individual Departures and may prefer to simply be informed of the designer’s deliberations as part of the general arrangements for “client approval” of a highway scheme. This process could include the designer completing the suggested Departures proforma (see Annex C) for his own purposes and retention in his internal records, yet being available for sample inspection by the highway authority.

[5] Other approaches could include the designer presenting the case to a highway authority Departures Panel and that panel, via formal minutes, agreeing the issues.

3.3 OBJECTIVES

3.3.1 The objectives of this Guidance are:

- To enable a highway authority to establish a policy and procedures for Departures From Standard e.g. a highway authority may choose to adopt this document wholly or amend it to produce a similar document or produce desk-top procedures that supplement it
- To provide a simple pro-forma for recording and determining Departures from Standard
- To provide basic tools for risk assessment
- To define the respective roles and responsibilities of the Design Organisation and highway authority staff.

3.3.2 This Guidance is not intended to provide a 'designer's manual': it is the responsibility of the Design Organisation to ensure that staff with the necessary skills are involved at all stages of the process. However, design issues of particular relevance to the assessment of Departures are highlighted

3.3.3 The anticipated benefits to be derived from the implementation of this Guidance are:

- Ensuring a high quality of submissions and quick determinations
- Minimising the number of Departures being rejected
- Minimising the risk of unintended consequences on the network
- Greater stimulus to innovation
- Whole life cost savings

3.4 LEGAL POSITION

3.4.1 It is only trunk roads that are required to be designed according to the Design Manual for Roads and Bridges. For all other roads[6] the decisions on the choice of standards and their incorporation into designs remain in the hands of local highway authorities.

3.4.2 In the case of risks related to construction of the works or future roadworker activity, the duty under Health and Safety legislation is to reduce risks so that they are “As Low As Reasonably Practicable” (“ALARP”) (also known as “So Far As Is Reasonably Practicable”). HASWA is not normally applicable to road accidents involving public road users but it applies to situations that are relevant to those who work on the network. This is reinforced by the CDM Regulations.

3.4.3 The UKRLG publication “Highway risk and liability claims: A Practical Guide to Appendix C of The Roads Board report “Well Maintained Highways - Code of Practice for Highway Maintenance Management” notes that:

“Road users bear responsibility for their own safety. Courts will apportion responsibility. (A) Claimant will have to establish that they were entrapped into

[6] Where a trunk road scheme has an effect on a local highway, the local highway authority should agree the process with the trunk road authority.

danger. It is only in exceptional circumstances that individuals may be able to establish a breach of duty of care."

3.4.4 Following an accident investigation, the discovery of the implementation of a design that was not in accordance with a recognised standard may be cited as a material consideration in any accusation of a failure in a duty of care. In these circumstances both the Design Organisation and the highway authority would need to be able to demonstrate that they exercised a reasonable level of professional skill and care in the submission and determination of a Departure. This process is easier and less expensive if good records exist and if exhaustive retrospective investigation of design documents can be avoided.

3.4.5 In general drivers have to "take the road as they find it". The risk of a highway authority being held liable in law is potentially lessened if any Departures from its standards could be shown, via records, to have been adequately considered. Whilst the principle of ALARP does not strictly apply in law for consideration of risks to public road users, using the same principles in preparing and justifying the safety aspects of a Departure is considered good administrative practice.

3.4.6 It is important to note that decisions should not be made on the grounds of safety or risk alone. Decisions should be balanced and take account of all relevant impacts, factors and constraints. Highway authorities may exercise considerable discretion in developing and applying their own local policies and standards.

3.4.7 Notwithstanding the above, all persons involved in processing a Departure, whether preparing, submitting or determining an application, have a duty and responsibility to apply reasonable professional skill and care to that task. Highway Authorities and their employers may be criticised and/or found to be legally liable,in the event of a dispute or legal action.

Other Documents

3.4.8 For highway structures BD2 (DMRB Volume 1.1) provides additional advice on Departures and technical approval and should be used unless the highway authority has developed an alternative document within its Declared Standards.

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4. The Benefits of Departures

4.1.1 Local highway authorities operate in a challenging environment where value for money is an important consideration. Without suitable processes for managing Departures from Standards it may not be possible to fully embrace lean designs that lead to potential cost savings or other forms of "added value", or to resolve issues where there are severe constraints such as available highway land.

4.1.2 Giving highway authorities the confidence to handle Departures from Standards is an important step in making highway designs fit the overarching project or authority objectives, including cost constraints. Authorities and Design Organisations that are excessively risk averse may inadvertently increase construction costs or unnecessarily delay projects or fail to make the best advantage of new innovative techniques.

4.1.3 In the event that a novel or lean design results in pre-construction challenge or post opening investigation, the demonstration of a suitable process and provision of an audit trail is of high importance in defending the decisions taken. Standards are developed with future maintenance[7] and whole life costs[8] in mind. Such issues should be considered in any non-standard situation and without effective safeguards there is a possibility that future problems may be built into designs.

4.1.4 Standards are not statutory documents, but represent the best advice[9] that was available at the time that they were written. The basis for a Mandatory Requirement may no longer be valid and even where it is broadly valid, the author of an individual standard cannot reasonably be expected to have foreseen all combinations of circumstances, including alternative compensatory measures that are within the gift of the highway authority.

4.1.5 The development of standards to take account of new ideas can sometimes be frustrated by a lack of evidence that alternative approaches can work. Although the use of a Departures process does not replace the need for a thorough post-opening evaluation and dissemination of outcomes, it could supplement such activities thereby creating a "virtuous circle" of information that will assist future projects.

[7] Conversely older standards may become out-dated over time and highway authorities should retain an open mind in considering if new maintenance techniques would require a change to the Declared Standards particularly if a useful feature (for the benefit of maintenance) was omitted from the default standard.

[8] Conversely older standards may become out-dated over time and highway authorities should retain an open mind in considering if new technologies (e.g. LED lighting or dimming technology) could reduce the future financial cost of maintenance or operation.

[9] Many standards, particularly those in DMRB are written only with high flow, high speeds routes in mind.

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5. The Procedure

5.1 PRINCIPLES

5.1.1 An important principle is to ensure that the balance of investigation, assessment and decision-making responsibility rests with the Design Organisation in order to speed up the process and reduce the burden on highway authority staff. This Guidance recognises that the Design Organisation is in the best position to initially assess the merits or otherwise of Departure applications related to their scheme and make it clear that the onus is on them to clearly demonstrate that a proposed Departure from Standard is justified. An overview of the procedure is given in Figure 1 below.

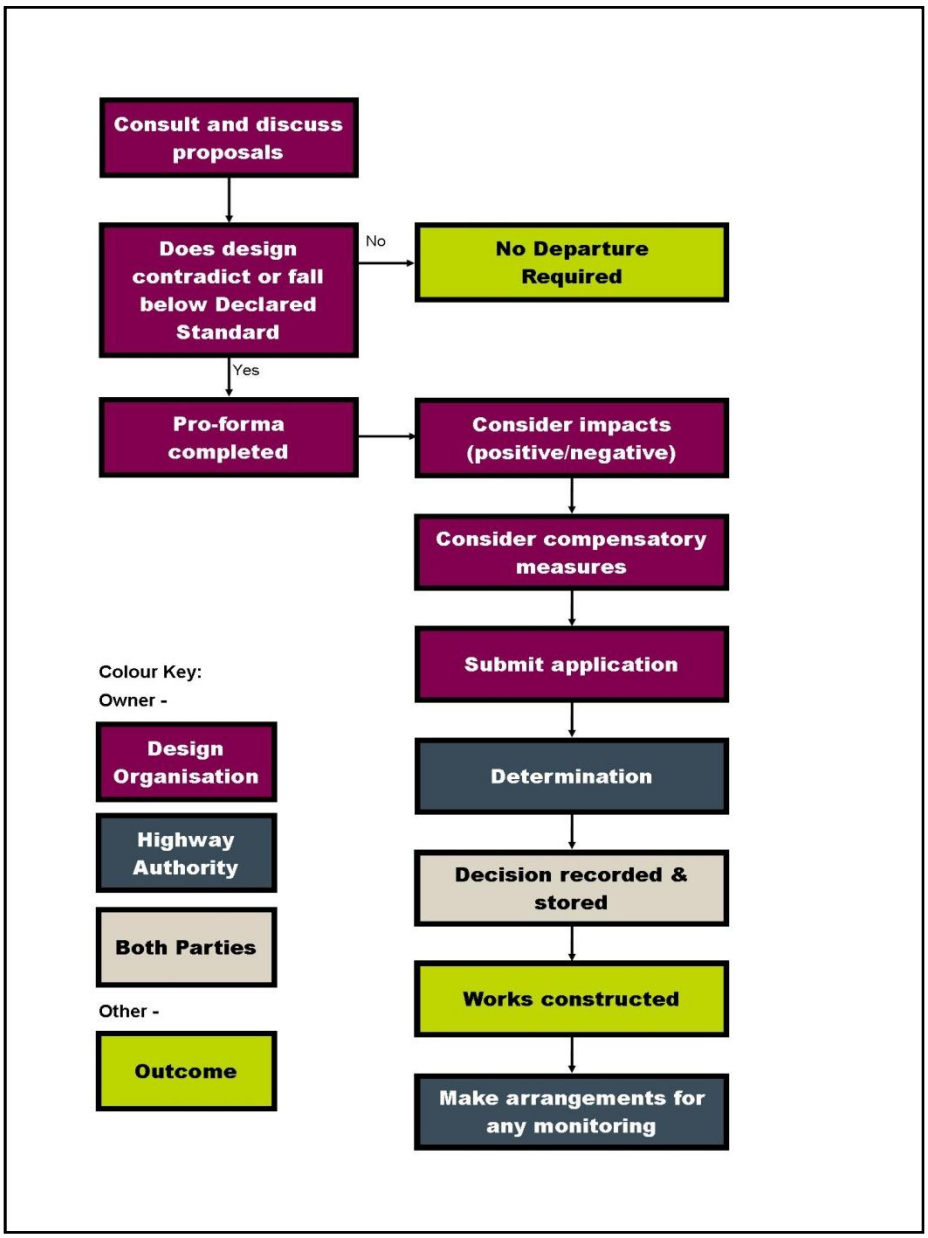

Figure 1: Overview of procedure

5.2 ROLES AND RESPONSIBILITIES: DESIGN ORGANISATION

5.2.1 The primary responsibility for the assessment of a proposed Departure lies with the Design Organisation. Design Organisations not appointed by the highway authority (e.g. on developer schemes) should satisfy themselves and the highway authority that they are competent to carry out highway design work of the type submitted and have the appropriate professional indemnity insurance.

5.2.2 The Design Organisation is responsible for the identification of **all** Departures from **all** Declared Standards[10] including **all** Aspects not covered by Standards involved in a particular design.

5.2.3 Whilst Design Organisations should be mindful of the standards used by the highway authority it is important that they remain alert to the possibility of adding value by proposing designs that may be variants from those presented in standards

5.2.4 The Design Organisation should assess the risks, negative impacts and benefits involved with a proposed Departure. The assessment should consider safety, technical issues, programme, economic and environmental issues as well as durability, routine and major maintenance requirements, disruption during the works and network resilience. The needs of any group that may be affected should also be considered, for example, residents, businesses, non-motorised users and motorised users

5.2.5 It is not always reasonably practical to be abreast of all completed and ongoing research, but this is now becoming easier as funders of research are increasingly distributing results via public websites ahead of incorporation into standards. Design Organisations should make best use of their industry contacts and public websites not only to support Departures applications but also to support innovative design concepts not yet contained in standards.

5.2.6 As part of the assessment of a proposed Departure, Design Organisations should carry out all necessary consultations. This should include consultation with the relevant maintenance organisation (as advised by the highway authority) covering the area of the proposed Departure. All such consultations should be summarised in the application.

5.2.7 The Design Organisation should be able to confirm that the residual risks are acceptably low and that the negative impacts are outweighed by the benefits associated with the Departure and the benefits associated with the scheme as a whole.

5.2.8 The Design Organisation should compare the proposed Departure with a design[11] fully in accordance with Standards.

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[10] Where occasionally the process of identification of standards that comprise the "Declared Standards" has not taken place (by the highway authority), the Design Organisation should at the outset of the design seek clarification from the highway authority of the appropriate standards to use.

[11] Where a design fully in accordance with standards is clearly not a feasible option, such a design need not necessarily be formally prepared to a detailed level. The level of preparation of a compliant design should be limited to the point that a broad understanding of the likely consequences of a compliant design can be gained

5.2.9 The Design Organisation should consider alternatives and reasons for promoting the proposed option rather than an alternative.

5.2.10 The Design Organisation is responsible for the accuracy, comprehensiveness and validity of the statements made regarding its proposals. By submitting an application for a Departure from Standard, the Design Organisation is indicating that it has used reasonable professional skill and care.

5.2.11 The Design Organisation shall retain responsibility for the quality of design incorporating the Departure, including user safety, buildability, maintainability, compliance with the CDM Regulations and environmental legislation.

5.3 ROLES AND RESPONSIBILITIES: HIGHWAYS AUTHORITY

5.3.1 The role of the highways authority is to determine if a Departure, based on the details submitted by the Design Organisation with the application, represents a convincing argument that may be brought forward at any future date to assist in explaining the actions taken. The highway authority should be convinced that the case shows that the benefits outweigh any disbenefits. In practice, particularly where impacts cannot be easily monetarised, this requires professional judgement.

5.3.2 In reflecting upon a submission, the highway authority should recognise that firm evidence may not always be available to the Design Organisation, particularly for innovative designs. The absence of firm evidence is not sufficient reason on its own to reject a design concept, but may be reason enough to justify a higher level of scrutiny and consultation.

5.3.3 Where a Departure application is found to be incomplete or inaccurate, inadequately prepared or with insufficient justification, it should be rejected and returned to the Design Organisation for revision. It is helpful if the reasons for rejection are well articulated and an indication given as to whether a Departure may be approvable once additional justification is available.

5.3.4 The highway authority should not compile part or all of a Departure application on behalf of a Design Organisation, except where the design function is in-house. In this case the normal rules of “distance” between a designer and a client should be applied to ensure an appropriate level of scrutiny and challenge.

5.3.5 In situations where the Design Organisation is not competent to produce the necessary documentation (e.g. some developers with insufficient expertise) then the highway authority should ask the scheme promoter to seek specialist assistance from a suitably competent engineer with highway design expertise and appropriate professional indemnity cover.

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6. Overview of Standards and Departures

6.1 THE NEED FOR DEPARTURES FROM STANDARD

6.1.1 Despite the range of flexibility with standards that exists with respect to virtually all the significant road design features, there are situations in which the application of even the minimum criteria (including any allowable Relaxations) would result in safety, technical, programme, financial or environmental negative impacts greater than the benefits that would be obtained by incorporating the proposed Departure.

6.1.2 In other circumstances, innovation, cost or performance considerations may result in a Departure being proposed, providing it takes account of durability/maintenance and network resilience considerations and is consistent with current legislation, policy and the long-term route management strategy.

6.1.3 If the proposed design contradicts or is below the Mandatory Requirements of the current Declared Standard, or permitted as a Relaxation, then it is a Departure.

6.1.4 Highway authorities have at their discretion the power to develop or adopt specific Declared Standards. These may be:

- Standards developed solely for the use of one authority
- Standards developed and shared with peer authorities
- National documents e.g. specific parts of DMRB
- Simply a library of supplementary paragraphs appropriate for the local situation (e.g. to append to DMRB)

6.1.5 When deciding if the Departures process needs to be applied, the designer should compare the design against the Declared Standard, which may not always be the DMRB.

6.1.6 It is recommended that highway authorities produce a list[12] of their Declared Standards and make this known to designers. It is also helpful if the list includes details of other advice and guidance documents recognised by the highway authority.

6.1.7 Several highway authorities have found it useful to distinguish between different classes of highway by reference to speed limits and route purpose when defining the appropriate standards to use and whether such documents are to be considered mandatory or advisory. Some authorities distinguish between “roads” and “streets” in their hierarchy.

[12] This exercise should include identification of documents from The Transport Advice Portal [See www.tap.iht.org]. Many highway authorities have completed this task and in a variety of ways. It is suggested that similar highway authorities are contacted to obtain examples.

6.1.8 It is noted that many guidance notes for the design of “streets” encourage the use of professional judgement and on the assumption that such guidance notes form part of the highway authority’s suite of design standards, then in these circumstances Departures from Standard may not be required.

6.1.9 In certain defined circumstances it may be appropriate for highway authority to extend the use and scope of Relaxations.

6.1.10 Highway authorities may find it useful to re-draft[13] GD 1/08 (DMRB Volume 0.1.2) to produce a formal introductory document for their adopted suite of design standards and guidance.

6.2 ASPECTS NOT COVERED BY DECLARED STANDARDS

6.2.1 The need to prepare Departures where no Declared Standard exists is often an area of debate and uncertainty. The importance of preparing appropriate Declared Standards is emphasised to minimise this uncertainty.

6.2.2 It is often not practical to generate numerous departures where there is a general lack of robustness in the list of Declared Standards. Where necessary the Design Organisation can instead recommend that a particular standard is introduced for an individual project and once agreed with the highway authority that standard can be used as the benchmark, with Departures only being needed when non-compliances with Mandatory Requirements are identified.

6.2.3 Where there is a genuine gap in an otherwise appropriate set of Declared Standards then Departures as Aspects not covered by Declared Standards may be required.

6.2.4 Where a Declared Standard does not prescribe a method for complying with a particular Mandatory Requirement, then it is possible that a Departure for an Aspect not covered by a Declared Standard may be required. The Design Organisation should reach agreement with the highway authority on how to proceed in these circumstances. For example where analytical design (e.g. for pavements or structural elements) is to be used and the technique is a recognised industry practice, the need to process a Departure may be avoidable.

6.3 EXCLUSIONS

6.3.1 It should be noted that a separate process[14] exists for the authorisation of non-prescribed traffic signs. The use of a Departures process is not to be used to replace that process, but in some circumstances the storage of records in a common system may be useful.

[13] For example Transport for London has carried out this exercise.

[14] This process is owned by the Department for Transport. Non-prescribed signs cannot be authorised in circumstances where standard (prescribed in TSRGD) signs must be used.

6.4 TIMING OF DEPARTURES

6.4.1 The timing of Departure applications should be discussed with the Project Manager who may need to consult with other highway authority staff or external advisors. Bearing in mind different procurement routes, key stages may include:

- Entry into programme
- Prior to Public Consultation
- Before completion of preliminary design
- Before completion of detailed design
- After Public Inquiry/before Works Commitment
- In respect of developer-funded highway works, prior to the grant of planning permission for the associated development

6.4.2 The Project Manager will be best placed to make decisions on timing because inevitably decisions on Departures are likely to be affected by contractual, financial and programme considerations. Project Managers should satisfy themselves that due weight is given to these issues. Individual standards also normally mandate that Departures are agreed for inclusion in designs before the appropriate design stage is completed and signed-off.

6.4.3 At the early stages of schemes some design concepts may be insufficiently developed to allow a full risk assessment to be carried out. For example surveys and investigations may be ongoing to determine if a structure is to be retained or demolished. In these cases an agreement in principle may be more useful than a full agreement to a Departure. However at an appropriate later stage an agreement in principle should be converted into a full Departure determination.

6.4.4 Unless the Departure is invalid by virtue of time (see 6.4.6 below), there would normally not be a requirement to provide a like-for-like repeat application at every scheme milestone. However it is unusual for all material facts to remain unchanged as time moves on and where doubt exists over the validity of previous approvals they should be re-examined or agreement reached that they need not be re-examined.

6.4.5 "Retrospective" Departures[15] should not normally be considered and it is important that design decisions and related standards issues are agreed with the relevant highway authority before site work commences.

[15] This is where a Departure is discovered after construction. In such cases it is likely to be appropriate to use the contractual provisions to determine the desired process. Where the design changes during construction works, any new Departure or any necessary amendment to a pre-works Departure that results from the design change can still be dealt with using this Guidance.

6.4.6 Previous Departure approvals will normally be considered as potentially invalid if one or more of the following apply:

- If the construction works have not commenced within a period of 5 years[16] from Departure approval.
- Where a replacement or complementary Standard[17] has been published and has been adopted by the highway authority as a Declared Standard.
- If a material change in a scheme design parameter generates additional risk (e.g. if a new traffic forecast shows a material change compared to the previous forecast).
- Where verifiable research or legislation in force affects the basis on which the Departure was approved.
- If either the Design Organisation or highway authority considers that a change in any other factor may affect the previous approval.

[16] The choice of 5 years is somewhat arbitrary (but is equivalent to the "shelf-life" of Road Safety Audit reports prepared to HD 19) and a highway authority may choose to set a different time period. Where none of the other bullets apply, then the time issue alone is less likely to be relevant in deciding if a revised application is preferred.
[17] Including relevant Interim Advice Notes produced by the national Overseeing Organisations.

7. Design Considerations

When completing the proforma given in Annex C and considering possible Departures, there are a number of design issues which should be taken into account. Many of these issues are highlighted in Annex E but these are by no means exhaustive and are included to prompt further thought. The Design Organisation should ensure that all relevant design issues for a particular Departure application have been assessed.

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8. Assessment of Departures

8.1 INTRODUCTION

8.1.1 When all the design issues have been considered and evaluated, an assessment of the proposed Departure should be carried out by the highway authority.

8.1.2 Due to the varying nature of Departures, their interaction with each other and the existing and future route conditions, each Departure is unique. Therefore, there are no rigid criteria as to whether a particular Departure will be approved or rejected. However, the following would normally be among the factors considered during assessment:

- It should be demonstrable that the benefits significantly outweigh any negative impacts of the proposed Departure through a comparison with a design fully in accordance with Standards[18].
- The avoidance of introducing a discontinuity into the route in terms of its current and known future strategy; e.g. future operational performance requirements.
- The avoidance of a road design that is ambiguous to users. The assessment of this factor will need to take account of the normal range of operating conditions that users can be expected to encounter including varying traffic flows and weather conditions.
- Any significant increase in risk to any user or potential user of the route as a result of the incorporation of the Departure into the works should be considered for compensatory measures.
- The proposed design should be consistent with scheme objectives, current legislation, authority policy and long-term Route Management / Regional Investment Strategies.

8.2 RISK ASSESSMENTS

8.2.1 The Design Organisation should fully assess the risks associated with Departures being proposed. Risks to road user safety, financial, programme (including land and statutory procedures), environmental and network resilience (e.g. congestion and loss of capacity) should be considered. The MHSW Regulations also require that a 'suitable and sufficient assessment' is made of risks to people, and in the context of Departures this relates to the safety of operatives and other road based staff during construction, inspection and future maintenance.

8.2.2 The most appropriate method of risk assessment should be determined by the Design Organisation. Where a long term relationship between the Design Organisation and the highway authority is envisaged, there may be advantages of agreeing a standardised approach to this process. In order to assist Design Organisations in evaluating the justification for the Departure, example

[18] Noting the practical limitations on the design process set out in footnote to paragraph 5.2.8.

evaluation tools are described later in this Section and set out in detail in Annexes A and B. These tools provide a framework to enable designers to compare risks and benefits on a reasonably transparent basis. These evaluations (or similar) should be attached to the Departure application.

8.2.3 It is important to recognise that a risk assessment is rarely corroborated against a reliable accident model and the resultant risk score is a relative measure rather than an absolute measure of risk.

8.2.4 The most critical element of the risk assessment is the identification of a full range of individual hazards and factors within the design and full consideration of the road user groups, including maintainers, that could be affected. This process should not be treated as an appendage to a design but should actually be useful in preparing an appropriate design. Risk assessments should not only be prepared at the end of the design process as such a process becomes merely one of identifying residual risks. Brain storming at the commencement of the process will frequently enable risks to be better understood and/or designed-out as the design progresses, thus also reducing the need for Departures. For example in the case of visibility that is below standard the designer would need to consider:

- Any crossing points or desire lines for the full range of Non-motorised Users (NMUs) at this location
- For two-stage NMU or vehicular crossings, the amount of storage space in the central area
- The propensity for operatives to be regularly maintaining equipment at this location
- The propensity for queuing traffic at this location
- The route hierarchy for winter maintenance and likelihood of ice forming
- The likely speeds at this point due to the approach alignment

8.2.5 The above example illustrates the importance of designers using their experience to understand and assess risk. Currently in the UK there is a lack of robust research data to support the use of Accident Modification Factors (AMF)[19].

8.2.6 A number of risk assessment techniques are available, and these can be useful in appropriate circumstances. For complex situations, designers should consider using a range of techniques to gain confidence in their findings rather than relying on one particular technique. Uncertainty should be recognised when using the results to inform decisions (e.g. by sensitivity analysis). Suggested approaches to risk identification and techniques for risk assessment are set out in this Guidance, however, it is the Design Organisation's responsibility to select and use an appropriate and robust methodology.

8.2.7 The Design Organisation should record a summary of the primary design options that have been considered and the reasoning behind rejected options.

[19] Where AMFs are known they can generate a simplistic numerical basis for the risk assessment e.g. if a visibility of a certain number of steps below standard was researched and shown to be associated with a 3% increase in accidents then an AMF of 1.03 could be applied (by multiplication) to an average accident frequency for the route type. However AMFs are generally based on high level accident data and on their own they do not provide detailed insight into specific combinations of circumstances.

This approach is useful in demonstrating the thoroughness of the design process.

8.2.8 The overall risk assessment and selection of options should have regard to the intended life cycle, including construction, operation, maintenance and foreseeable modifications (e.g. where a wide pavement may be needed in the near future it may be preferable to construct the maximum width at the outset, but with hatching to reduce the width in the interim). It may be appropriate to 'trade-off' risks between different stages of the life cycle in order to obtain the safest solution overall.

8.3 RISK ASSESSMENT TOOL – RISK MATRIX

8.3.1 The Risk Assessment Tool (see Annex A) utilises a risk matrix to assess the broad justification for a proposed Departure in terms of risk alone. This tool should only be used by Design Organisations as a 'first pass' filter since it does not address the other impacts and benefits of the proposal.

8.3.2 Where the Risk Assessment Tool is used, a copy of the risk matrix assessment, including the potential hazards identified and the reasoning behind the selection of severity, likelihood and Overall Risk Level should be included within the Departure application.

8.4 COST BENEFIT TOOL

8.4.1 The decision about whether or not a Departure is justified will often be based in part on economic grounds. One of the main justifications for applying for a Departure from Standard is that significant financial cost[20] would be involved in fully conforming to a standard.

8.4.2 If the cost to the community of any potential increased accident risk stemming from a Departure can be estimated, then this can be compared with the construction cost of conforming to a standard thus allowing a more informed decision to be reached. The costs to the community will accrue over time whilst the cost saving of conforming to a standard will occur close to the time of opening the scheme and will generally be a 'one-off' saving.

8.4.3 The Cost Benefit Tool is an order-of-magnitude technique which provides a simplified methodology to allow designers to consider, on comparable terms, the construction cost savings obtained from a proposed Departure from Standard against a judgement of the maximum likely change in annual road user accidents arising from the Departure. The methodology is set out in Annex B. This tool should only be used as a filter and not a single deciding factor since non-accident related impacts (e.g. delays) are not taken into account when using this tool.

[20] It is noteworthy that money saved on one project can be used to bring about benefits elsewhere on the network. Therefore Departures that are associated with monetary savings should be perceived by designers and highway authorities as a means of increasing overall benefits within the context of the wider network and the circumstances should not be considered purely at a single location.

8.5 ROAD SAFETY AUDIT

8.5.1 Dependant on the detailed policy and standard adopted by the highway authority it is normally the case that road safety auditors are made aware of the prospect of Departures being included in road layout designs before they commence a Road Safety Audit. The input of a road safety auditor should be beneficial to the overall process that includes consideration of safety and non-safety issues.

9. Determination of Departures

9.1 GENERAL

9.1.1 The highway authority has three choices when deciding whether to accept a Departure application. It can determine that a Departure be approved, approved with comments or rejected.

9.1.2 The highway authority may be content to approve a Departure if it believes that:

- a sufficiently strong case has been made by the applicant; and
- the explanation is comprehensible to an outside professional observer with no inherent scheme knowledge; and
- sufficient consultation with stakeholders has been carried out

9.1.3 If a Departure is rejected it would be appropriate to explain the reason for the rejection. If a Departure is approved with comments, it is noted that written comments[21] that positively direct the design may attract designer's responsibilities to the highway authority. It would normally be preferable to prompt the designer to consider these issues in the next design iteration. For example a highway authority may have noted that a proposed traffic sign is inappropriate as a compensatory measure. Rather than the highway authority directly asking for such a sign to be removed from the design it is likely to be preferable for the Design Organisation to be asked to review the need for such a sign with reference to the Traffic Signs Manual and any local policies, e.g. in the cases of signs, any policy on urban design and street clutter.

9.1.4 When a departure is approved with comments, it is often desirable for the commentator to reference comments with a numbering system so that they can be easily understood and subsequently managed by the applicant.

9.2 TIMESCALES FOR RESPONSE

9.2.1 The highway authority may wish to consider what would represent a default time period for its response and publish this in its policy. This will enable those preparing Departures to adequately programme the preparation of designs.

[21] Constructive dialogue between the designer and highway authority will increase comprehension of viewpoints and interpretation of issues.

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10. Competencies and Roles

10.1 COMPETENCY FOR HIGHWAY AUTHORITIES

10.1.1 Highway authorities may wish to define the competencies involved in the determination of Departures and formally delegate responsibilities to their engineers accordingly. On occasion[22] it may be appropriate to utilise the services of an external consultant to assist with the determination. In such cases it is recommended that the comments of the consultant are incorporated on the Departures proforma. Other than in exceptional circumstances and where there is a clear transfer of a highway authority's powers it still would remain the responsibility of the highway authority to determine the application.

10.1.2 It would normally be the case that the highway authority utilises a two stage process so that two officers assess a submission. The submission should be initially assessed by the Project Manager for completeness and general suitably. It is suggested that a more senior member of staff should then formally complete the process of determining the Departure. This is to ensure that sufficiently independent rigour is applied to the process and to avoid "pride of ownership" being the over-riding concern for the Project Manager. Various options for this process exist and highway authorities may wish to develop an appropriate matrix of responsibility with associated competencies. This process would normally consider the use of professional competencies demonstrated through membership of professional bodies.

10.2 COMPETENCY FOR DESIGN ORGANISATIONS

10.2.1 It would normally be acceptable for the Design Organisation to utilise an internal checking and approval process, equivalent to that used for submission of technical reports, so that a sufficient level of independent rigour can be demonstrated. The essential elements are that independent scrutiny is applied to ensure that:

- the submission is complete and technically accurate; and
- the justification can be substantiated

10.2.2 It is recommended that the relevant staff involved in the preparation and subsequent agreement of the contents of the submission are stated on a standard "cover sheet" attached to the completed proforma, consistent with document submission protocols adopted by the Design Organisation and acceptable to the highway authority.

10.3 INDIVIDUALS

10.3.1 It is possible that one or more parties or individuals may impose undue influence on the process, particularly where there is a perception that written standards should have a greater influence than might be borne out by the detailed analysis or project circumstances. In the event of divergent

[22] For example when dealing with Departures for a Category 3 structure

conclusions being reached, this may need to be resolved through an escalation process involving senior staff of the highway authority and Design Organisation.

11. Monitoring

11.1.1 The basic level of post-construction safety monitoring for each scheme is normally given in the local authority's standard for road safety audit or in the rolling procedure for accident investigation and prevention.

11.1.2 Very occasionally the use of post opening "conflict analysis" may be warranted to allow an early opinion to be formed of the likely accident performance.

11.1.3 The Design Organisation should consider the desirability of safety monitoring or other post-opening monitoring and advise what arrangements are considered desirable.

11.1.4 The highway authority may also advise if a different level of monitoring is required as a condition when approving Departures for more innovative, unusual or contentious schemes. This may be particularly important when a new concept may have wider application in future years.

11.1.5 Where durability of a product in-service is required to be measured, the process put in place should take account of the likely accessibility and techniques for such scrutiny. Additionally the timeframe should take account of any maintenance periods in contracts and any warranties supplied by manufacturers.

11.1.6 Imprecise statements should be avoided. If a Departure requires specific monitoring, this should be stated and details of responsibility, frequency and duration included in the application or approval comments.

11.1.7 Monitoring that goes beyond the minimum provision outlined in paragraph 11.1.1 can be expensive and would require a case to be made for inclusion. This process includes considering the potential worst case outcomes and the likelihood of such outcomes occurring.

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12. Continuous Improvement

12.1 REVIEW PROCESS

12.1.1 A periodic review of policies and processes would assist with :

- Them remaining relevant and efficient
- Informing the development of highway authority design standards
- Ensuring staff delegations and competencies remain appropriate

12.2 SHARING EXPERIENCES

12.2.1 Highway authorities should consider sharing their experiences with neighbouring authorities, particularly those embarking on their first formal development of policy and procedures.

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13. Submission Requirements

13.1 GENERAL REQUIREMENTS

13.1.1 Normally it will be appropriate to submit individual applications for each aspect of the design that falls outside of the Declared Standards. To reduce the burden on all parties it may sometimes be appropriate to combine issues. For example if a rock face cannot be avoided then this may give rise to cross-section and horizontal alignment Departures. A single Departure related to the reason (the rock face) may be appropriate on the basis that the individual aspects that fall below standards are all discussed adequately in a single application.

13.1.2 In order to aid Design Organisations in the preparation of fully detailed applications, a specific proforma is given in Annex C. The template can be amended as necessary by the highway authority. The size of text boxes can be amended by the applicant. Examples of how to complete the Annex C proforma are given in Annex D.

13.1.3 The Design Organisation should ask the highway authority if hard copies of documents and drawings are necessary for each attachment referenced in a Departure application.

13.1.4 Design Organisations are reminded that is their duty to ensure that Departure applications are complete, and that responsibility for any errors or omissions remains with them.

13.2 SUBMISSION DOCUMENTS

13.2.1 In general it is recommended that detailed reports, normally prepared for other purposes, are not attached to Departure applications. It is not the intention of the Departure process to capture all aspects of the design process, but it is the intention to summarise the salient facts and assumptions. When summarising information it is good practice to reference the source documents sufficiently so that documents can be retrieved in future. Attachments to the Departure application should be clearly identified and listed (e.g. drawing numbers) so that the reader can ascertain the scope of the submission and the information he is being expected to read.

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14. Record Keeping

14.1.1 Departure records should be stored in such a way that they can be readily retrieved. Whilst this does not always necessitate electronic storage[23], as a minimum it is suggested that electronic media is used to identify the location of any paper files.

14.1.2 Consideration should be given to providing unique document naming and referencing within a formal system so that the road name/number, departure type (by specialism) and other unique identifiers are included. Whatever system is chosen, the identification number for the Departure should always appear on the record form.

14.1.3 Because Departure records may be called upon in the event of any accident some time after a road opens it is not uncommon for long periods of storage to be required. Documents should be stored by the Design Organisation and highway authority according to the current policy for document retention. Periods of 20 years or even 30 years are known to be common. Similar periods are recommended for Design Organisations.

14.1.4 Where Departures contain information that would be useful for maintainers the CDM Co-ordinator should be informed so that he can consider the inclusion of the information for the project Health and Safety file.

14.1.5 Where the highway authority maintains an asset management system, relevant information should be added and retained on such a system so that the future maintenance of an asset is aligned with the assumptions made at the time a Departure is agreed.

[23] For authorities setting up a procedure for the first time the use of electronic media may prove to offer the best option.

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Annex A
Risk Assessment Tool – The Risk Matrix

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ANNEX A: RISK ASSESSMENT TOOL – THE RISK MATRIX

A1 OVERVIEW

Risk is the likelihood of potential harm from a hazard being realised. The extent of risk will depend on:

- The likelihood/probability of that harm occurring
- The potential severity of that harm, i.e. of any resultant injury or adverse health effect
- The population which might be affected by the hazard, i.e. the number of people who might be exposed.

There are various matrix methods of assessing and recording risk. An example is given overleaf.

Step 1: Identification of hazards
The first step of methodology involves the identification of potential hazards resulting from works being built using a proposed Departure compared with works being built in accordance with Declared Standards.

Step 2: Assess the potential severity of harm
For each hazard, make an assessment of the potential severity in terms of accident type. The reasoning behind the selection of severity category should be recorded. The severity is normally related to the most typical outcome rather than the worst case outcome. Reported Road Casualties Great Britain gives information at a national scale of severity outcomes, but local data should also be referred to.

Step 3: Assess the likelihood/probability
For each hazard make an assessment of the relative probability of an accident occurring, bearing in mind that any accident is rare, random and multi-factored. Probability is a function of exposure in combination with other factors. Exposure can be derived from vehicle flows and compositions and, where relevant, non-motorised user flows. Other factors that can affect likelihood include route type, route function, route location, Departure location and frequency of severe weather conditions.

Using experience and engineering judgement, consider all the factors that affect probability in each individual case and select a category. The reasoning behind the selection of category should be recorded.
The selection should be based on additional accidents possible as a result of the departure, not an expectation of 'inherent' underlying accidents for the route or junction type.

Step 4: Assess the Risk Classification for each hazard
Use the risk matrix below to assess the risk associated with each hazard. Each hazard may result in significant variations in risk between user groups (HGVs, cars, motorcyclists, pedestrians, cyclists and equestrians) under different road conditions and, where appropriate, the assessment should consider each in turn. The risk to those who work on the network should also be considered.

Step 5: Assess the overall Risk Classification for the Departure
Where different user groups and those who work on the network are considered separately, the element with the greatest Risk Classification will generally define the overall Risk Classification for the hazard.

Where there is more than one hazard associated with a Departure, the hazard with the greatest Risk Classification will generally define the overall Risk Classification of the proposal.

However, the person making the assessment needs to exercise engineering judgement and a greater or lesser overall Risk Classification may be selected provided that the reasoning behind this decision is recorded.

For hazards at “medium” or above, it will be necessary to consider additional or alternative compensatory measures. Where amended compensatory measures are to be included as part of the works, the Risk Classifications for these hazards should be reassessed using the risk matrix and the overall Risk Classification adjusted if appropriate.

Example Method of Hazard Identification & Risk Assessment (for Departures from Standards)

Project:		**Date:**	
Applicant:			
Departure Reference:			
Contact Details:			
Checked by:		**Date:**	

Ref	Hazard Description	P	S	R	Response/Control Measure/Compensatory Measure	P	S	R	Details
1									
2									
3									

Risk classification and required action:

Probability (P) *		Severity (S) *					Risk Classification (R)
		1	2	3	4	5	
		Minor	Moderate	Serious	Major	Catastrophic	
1	Extremely unlikely	1	2	3	4	5	Low (1-9) - Ensure assumed control measures are maintained and reviewed as necessary
2	Unlikely	2	4	6	8	10	Medium (10-19) – Additional control measures needed to reduce risk rating to a level which is equivalent to a test of "as low as is reasonably practicable".
3	Likely	3	6	9	12	15	
4	Extremely likely	4	8	12	16	20	High (20-25) - Activity not permitted. Hazard to be avoided or risk to be considerably reduced
5	Almost certain	5	10	15	20	25	

* Probability that harm will occur due to Departure:		
1	Extremely unlikely	Highly improbable, never known to occur
2	Unlikely	Less than 1 per 10 years
3	Likely	Once every 5-10 years
4	Extremely likely	Once every 1-4 years
5	Almost certain	Once a year

* Most common potential severity of harm: e.g.		
1	Minor harm	Minor damage or loss, no injury.
2	Moderate harm	Slight injury or illness, moderate damage or loss
3	Serious harm	Serious injury or illness, substantial damage or loss
4	Major harm	Fatal injury, major damage or loss
5	Catastrophic harm	Multiple fatalities, catastrophic damage or loss

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Annex B
Cost Benefit Tool – Economic Analysis

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ANNEX B: COST BENEFIT TOOL

B1 INTRODUCTION

This tool is an order-of-magnitude technique which provides a simplified methodology to allow designers to consider, on comparable terms, the whole life cost savings obtained from a proposed Departure from Standard against the designer's judgement of the maximum likely change in annual traffic accidents arising from the Departure. Where the designer judges that the departure is unlikely to have safety implications, only Step 1 is relevant.

B2 METHOD

The methodology suggested here only applies to localised changes to the infrastructure that are likely to have no more than a minimal impact on other parts of the network. This method of appraisal focuses on comparing potential increases in the number of accidents (the impacts) against whole life[24] cost savings from the infrastructure (the benefits). The analysis concentrates on safety effects, without considering vehicle operating and time costs, as the safety costs are generally the most important decision factor. However, where delays are likely to be caused over a long stretch of carriageway, then time costs and vehicle operating costs should also be considered separately as their impact may be significant.

The methodology for the appraisal has the following steps:

Step 1
Obtain the savings in whole life costs (ΔC). These are derived using the following expression:

$$\Delta C = C_2 - C_1$$

where C_2 represents the whole life cost of designing fully in accordance with Standards, while C_1 represents the whole life cost with the Departure from Standard incorporated.

Step 2
Obtain the typical cost of an average accident (A) for the relevant road type using the information published in the latest version of "Reported Road Casualties Great Britain" which is published annually[25]. It can be found on the Department for Transport's website. This document gives the average cost of the prevention of accidents for each injury category and different road types. Select the appropriate figure for the particular Departure site.

Step 3
Obtain the total number of accidents equivalent to the savings in whole life cost (N1)

---

[24] Various guidance documents exist on developing whole life cost analyses. For the purposes of most Departures the assessment need normally be only high level, with the choice of project life being the most sensitive factor. In the absence of other information to the contrary a minimum life of 30 years should be used in the assessment.

[25] See: http://www.dft.gov.uk/pgr/statistics/datatablespublications/accidents/casualtiesgbar/

$$N1 = \frac{\Delta C}{A}$$

To obtain an equivalent annual accident figure (N2), it is suggested that N1 is divided by the scheme design life. Typically assume a 30 year design life unless there is a reason to choose a lesser figure.

Step 4
Compare the annual number of accidents equivalent to the savings in whole life cost (N^2) against the designer's judgement of the maximum increase in annual accident numbers likely to be caused by the Departure from the design parameters required by the Standard. **Note: This can only be an order-of-magnitude assessment not a detailed calculation.**

B3 SITE EVALUATION

It is stressed that this technique does not provide an 'answer'; it is simply an aid to designers in balancing cost savings against possible small increases in potential accident risk. The technique will be particularly helpful where the 'accident equivalent' of the whole life cost saving is substantially larger (perhaps by several orders of magnitude) than any possible risk that could reasonably be expected to result from the Departure, or vice versa. But, even where this is the case, the designer should ultimately judge whether the Departure is likely to be justified or not.

Attention is drawn to tools that assist with predicting expected accident rates e.g. SAFENET, MOLASSES, UK MORSE , junction modelling and design software.

B4 SCHEME EVALUATION

Where the application of the above technique shows that the Departure may be associated with accident disbenefit costs and these costs outweigh the potential whole life cost savings, the Design Organisation should:

- Consider the other non-safety benefits and their relative importance.
- Consider the scale of overall (macro level) predicted scheme safety benefits for all design elements and how these compare with the (micro level) accident disbenefit costs at the Departure site and determine if the scheme still offers overall safety benefits i.e. macro level benefits minus the sum of individual micro level departure-related disbenefits.

Annex C
Departures Submission Pro-forma

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SUBMISSION FOR DEPARTURE FROM STANDARDS

PROJECT NAME	
APPLICANT ORGANISATION	
CONTACT DETAILS:	
APPLICANT REF	
HIGHWAY AUTHORITY REF	
DATE SUBMITTED	

1) PROJECT DETAILS

A	**Description**	
B	**Location**	
C	**Road category and type**	
D	**Design speed and speed limit**	
E	**Traffic and NMU flows**	

2) DEPARTURE DETAILS

A	**Discipline**	
	Type	
B	**Relevant Standard(s)**	
	Clause	
C	**Difference between Standard(s) and Proposed Design**	
D	**Reason for Departure (overview)**	
E	**Associated Project Departures**	

F	**Other options considered**	

3) JUSTIFICATION (POTENTIAL POSITIVE AND NEGATIVE IMPACTS)

A	**Safety**	
B	**Congestion/ delay**	
C	**Environmental/ Sustainability**	
D	**Capital and Whole Life Cost/Value**	
E	**Accessibility**	
F	**Integration**	
G	**Structural**	
H	**Network Resilience & Maintenance**	

4) COMPENSATORY MEASURES

A	**Included Measures**	
B	**Rejected Options**	

5) ATTACHMENTS & OTHER INFORMATION

A	**List of Attachments**	
B	**Consultations**	
C	**Other information**	

6) DESIGN ORGANISATION'S CONCLUDING REMARKS

7) DECISION

NAME 1		**ROLE**		**SIGNED**		**DATE**	
NAME 2		**ROLE**		**SIGNED**		**DATE**	

TICK ONE BOX	**1 - APPROVED**		**2 - APPROVED WITH COMMENTS**		**3 - REJECTED**		
***COMMENTS or *REASONS FOR REJECTION (*delete as applicable)**							

Notes for Completion

1. **This form must be provided with a signed cover sheet giving full details of the applicant's staff and checking process in accordance with the Quality Assurance procedures in place. The Departures submission should be considered as a "report".**
2. **If a particular box is not relevant, do not leave it blank, instead state "not applicable" or similar.**
3. **Names and signatures associated with the Decision (see Section 6) should be inserted in accordance with agreed responsibility and competency matrix set out by the highway authority policy.**
4. **When completing section 2A, please refer to list of choices provided by highway authority which will normally be broadly based on DMRB/volume or SHW/series categorisation.**

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Annex D
Sample Departures

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SUBMISSION FOR DEPARTURE FROM STANDARDS [EXAMPLE 1]

PROJECT NAME	A99 Black Boar Flyover
APPLICANT ORGANISATION	Smith's Infrastructure Management
APPLICANT REF	9165
HIGHWAY AUTHORITY REF	A99/DFS/STRUCTURE/001
CONTACT DETAILS	Terry Lehman (Senior Engineer) – t.lehman@smithsim.co.uk Tel: 0798 20101010
DATE SUBMITTED	05/10/08

1) PROJECT DETAILS

A	**Description**	As part of the parapet upgrade scheme on the A99 Black Boar Flyover, the waterproofing will be replaced. Once the existing waterproofing has been removed there is a potential for concrete repairs on the bridge deck subject to survey findings. Therefore, to minimise delay, it is proposed to apply the waterproofing membrane over any necessary concrete repair areas 7 days after they have concrete has been poured.
B	**Location**	A99 Black Boar Flyer
C	**Road category and type**	Dual 2 lane carriageway with hardstrips
D	**Design speed and speed limit**	85kph design speed, 50mph speed limit.
E	**Traffic and NMU flows**	18,000 AADT. NMU assessments have not been undertaken as the flyover has no footway. Cyclist flows are very low and unaffected by works.

2) DEPARTURE DETAILS

A	**Discipline**	Structures
	Type	Concrete curing time
B	**Relevant Standard(s)**	BD 47/99 – Waterproofing and Surfacing of Concrete Bridge Decks (DMRB Vol 2 Section 3)
	Clause	1.7 – Certification and Registration Requirements
C	**Difference between Standard(s) and Proposed Design**	The BBA certificates for various waterproofing systems, requires the membrane to be applied to a concrete surface that has been cast at least 28 days previously. This departure from the BBA Certification is to reduce the time to apply the waterproofing membrane to the repair mortar/ repair concrete from 28 days to a minimum of 7 days. The repairs will be carried out in accordance with BD 27/86.
D	**Reason for Departure (overview)**	It is anticipated that there will be 2 phases of re-waterproofing works undertaken on the A99 Black Boar Flyover within the carriageway. There is reasonable probability that a small number of patch concrete repairs will be required to the structure deck. If the repairs in each phase are subject to 28 days curing this would equate to a total of 8 weeks addition to the programme to allow for the curing operation. Experience on similar re-waterproofing works suggests that three weeks of every four week curing period within each phase could be on the critical path. By reducing the curing period to 1 week this could save 6 weeks of the programme.
E	**Associated Project Departures**	None

F	**Other options considered**	The option of removing the traffic management (TM) during the curing period was considered and rejected on the grounds that the overall cost saving would be significantly less, there would be an increase in risk to operatives due to the TM having to be erected and taken down twice. There is also a risk that the works may require attention on site during the 6 week period when the TM is not on site.

3) JUSTIFICATION (POTENTIAL POSITIVE AND NEGATIVE IMPACTS)

A	**Safety**	Although the TM design would be in accordance with Traffic Signs Manual Chapter 8 and safe, there is the potential for substantial queues of traffic. Therefore there are safety benefits to the travelling public of reducing the duration of queues. In addition, the length of time that the workforce are exposed to the hazard associated with working within traffic management will also be significantly reduced. A high moisture content could undermine the bond between the repair and the waterproofing. If the waterproofing were undermined it could become blistered and may become perforated. It could become susceptible to further deterioration as surface water would percolate through the surfacing and under the perforations. Under these circumstances the deterioration of the waterproofing system would accelerate. Eventually this could lead to carriageway failures and in extreme circumstances loss of control accidents.
B	**Congestion/ delay**	The reduction in programme time will significantly reduce congestion and delays as a result of the traffic management being on site for a lesser period.
C	**Environmental/ Sustainability**	A reduction in congestion and delay will reduce the overall emissions that would have otherwise being produced by queuing vehicles during the additional 6 weeks the traffic management could have been in place.
D	**Capital and Whole Life Cost/Value**	The proposed reduction to the curing time the subsequent reduction to the overall programme duration will result in an overall cost saving by reducing the preliminaries costs to the scheme. The preliminaries and traffic management costs are in the order of £10,000 per week. Based on these figures, the potential cost saving would be £60,000 depending on whether the 6% moisture content and 0.7 N/mm2 tensile adhesion at 7 days can be met – if not the programme will be extended and potential costs savings reduced.
E	**Accessibility**	The departure has no effect on accessibility. NMU alternative routes are not affected by the works.
F	**Integration**	No direct effect on bus stops. Bus services will suffer less delay as a result of the departure.
G	**Structural**	It is possible that the system could fail prematurely if the bond between the deck and waterproofing is undermined by moisture evaporating from the repair.
H	**Network Resilience & Maintenance**	The route will be at full capacity 6 weeks earlier if the departure is granted, however, If the waterproofing system were to fail a remedial scheme would be required which would cause further delays on the Network. Due to the compensatory measures detailed in 4A, this situation is unlikely to occur however.

4) COMPENSATORY MEASURES

A	**Included Measures**	The reasons for restricting the curing time before applying a waterproofing membrane is fully appreciated. Therefore, the moisture content shall be taken at the repair locations and the waterproofing membrane shall not be applied if the moisture content exceeds 6%. Similarly, the size of the repair shall be limited to a maximum size of 1 square metre per repair. The properties of proprietary repairs that comply with the standard BD27/86 are such that the rate of hydration is much quicker than standard cement mixes. Therefore, there will be a limited amount of moisture present at seven days, which will be below acceptable limits. Adhesion testing shall be carried out on repair areas and the perimeter surrounding those repair areas. The acceptance adhesion values will be increased to 0.7 N/mm^2 (133% greater than the minimum requirement of BD47 Appendix B), which will give confidence that failure will not occur. If the Contractor is unable to meet the 6% moisture content and 0.7 N/mm2 tensile adhesion at 7 days the approved programme will be extended. The testing will be via an independent company.
B	**Rejected Options**	N/A

5) DESIGN ORGANISATION'S CONCLUDING REMARKS

The approval of this Departure will enable the Highways Authority to minimise Network User delays and avoid significant expenditure on extended preliminaries on site. The control measures proposed will significantly reduced the likelihood of any of the risks identified being realised.

6) ATTACHMENTS & OTHER INFORMATION

A	**List of Attachments**	General Arrangement of proposed works. See Drawing XX100/01 Rev B.
B	**Consultations**	N/A
C	**Other information**	N/A

7) DECISION

NAME 1	James Green	**ROLE**	Senior Structures Advisor	**SIGNED**		**DATE**	06/11/08
NAME 2	Andrew Barns	**ROLE**	Structures Team Leader	**SIGNED**		**DATE**	08/11/08

TICK ONE BOX:	**1 - APPROVED**		**2 - APPROVED WITH COMMENTS**	✓	**3 - REJECTED**		

COMMENTS	It is incumbent on the contractor to ensure that the blacktop planing / scarifying operation is very carefully supervised in order to eliminate the need for repairs as a result of the planing operation itself. The contractor should consider the possibility of removing the existing waterproofing layer by hand in order to avoid the need for repairs. The level of workmanship, moisture content testing and adhesion testing should be very carefully monitored and supervised by the contractor and advised to the Engineer before water proofing proceeds. If the anticipated extent of repair areas significantly increases from that assumed, this information should be reported so that the acceptable curing time can be reviewed and agreed as the risks will obviously be greater.

	It can be difficult to achieve a U4 finish with concrete repair material. This tends to be 'self levelling' and the surface finish tends to be smooth, leading to lower adhesion values. Attention should be paid to achieving an appropriate surface finish, possibly by wire brushing or grit blasting. Specific advice should be sought from the waterproofing supplier on a suitable method to achieve the required adhesion > 0.7 N/mm^2.

SUBMISSION FOR DEPARTURE FROM STANDARDS [EXAMPLE 2]

PROJECT NAME	A200 Rose Farm Bridge
APPLICANT ORGANISATION	Jones Civil Engineering
APPLICANT REF	6515
HIGHWAY AUTHORITY REF	A200/DFS/STRUCTURES/004
CONTACT DETAILS:	Jason Gough (Head of Structures) – j.gough@jonescivil.co.uk
DATE SUBMITTED	01/05/07

1) PROJECT DETAILS

A	**Description**	Rose Farm bridge carries the A200 over the farm access road. The existing aluminium (P1) Parapet on the southbound carriageway of the bridge is of the BACO 301 Series and is substandard in terms of residual load carrying capacity. Its load carrying capacity is estimated to be 55% of current design requirements for normal containment level, N2. This parapet was constructed prior to 1988 with air-cooled sections and no suitable in-situ modification has been identified. As a corrective measure to safeguard the safety of road users, it is therefore proposed to provide a compliant aluminium parapet system of normal containment level (N2). The design of base plates is specific to this site and is to be considered as an “aspect not covered by standards”.
B	**Location**	A200 Rose Farm Bridge
C	**Road category and type**	Dual 2 Lane Carriageway
D	**Design speed and speed limit**	85kph design speed, but 70mph speed limit.
E	**Traffic and NMU flows**	16,000 AADT. There are no footway provisions on either side of the carriageway

2) DEPARTURE DETAILS

A	**Discipline**	Structures
	Type	Parapets
B	**Relevant Standard(s)**	TD19/06: Requirements for Road Restraint Systems
	Clause	N/A [Aspect Not Covered By Standards]
C	**Difference between Standard(s) and Proposed Design**	It is proposed to provide a compliant aluminium parapet system of normal containment level (N2) with posts at the same locations as the existing, but with modified base plates in order to utilise the existing cradle anchorages. The as-built drawings show that there is additional reinforcement found locally at the existing post positions. Calculations have confirmed that there is sufficient capacity in the edge plinth to allow posts to be installed at the existing post locations but not away from these positions.
D	**Reason for Departure (overview)**	Utilising the existing anchor positions in the areas of additional reinforcement should provide substantial time and cost savings along with limiting disruption to the network.

E	**Associated Project Departures**	Departure for the use of new parapets system with existing anchorages has been granted on other schemes in the area. See A10/A98 Junction Bridges Parapet Upgrade & Strengthening Works – Departure ID 4196
F	**Other options considered**	The option of undertaking significant structural reinforcement works to the bridge edge plinth was considered, but rejected due to the potential savings that could be achieved using the departure option.

3) JUSTIFICATION (POTENTIAL POSITIVE AND NEGATIVE IMPACTS)

A	**Safety**	Completing the works earlier than would normal be achievable and will reduce the time that traffic management will be in place, reducing the duration that road users will be exposed to this risk. In addition, the length of time that the workforce are exposed to the hazard associated with working within in close proximity to live traffic will be significantly reduced. The road is associated with tight horizontal and vertical alignment and this results in a lower theoretical design speed than the national speed limit that applies. Although there are no reported accidents at this parapet, the upstream and downstream sections of road (taken as 2km for purposes of analysis) show a number of accidents (5 in 3 years) involving vehicles leaving the carriageway.
B	**Congestion/ delay**	The works involve closure of one lane. This is expected to generate slight peak time delays as traffic merges into one lane ahead of the works although theoretically the capacity of one lane will not be exceeded. Completing the works earlier than would normal be achievable, but this offers only a modest benefit in terms of congestion/delay.
C	**Environmental/ Sustainability**	N/A
D	**Capital and Whole Life Cost/Value**	There will be a significant saving in terms of scheme duration through utilising the existing cradle anchorage system as this prevents the need for coring new anchors. This has significant cost saving potential (in the order of £25,000).
E	**Accessibility**	N/A
F	**Integration**	N/A
G	**Structural**	Utilising the existing cradle anchorage system will reduce the risk of drilling through reinforcement, which could compromise the integrity of the edge plinth Utilising the compensatory measures identified in part 4, there will be no residual concern for the structural of the bridge or suitability of the replacement parapet.
H	**Network Resilience & Maintenance**	N/A

4) COMPENSATORY MEASURES

A	**Included Measures**	Pull-out tests in accordance with BS5080: Part 1: 1993 will be undertaken on the existing bolt anchors prior to work commencing in order to prove adequate strength. Initially, all four bolts of one anchorage will be tested for adequacy. If the initial four tests prove successful, the testing frequency will be reduced to one tension bolt on every other post anchorage for the remaining posts. Should any initial or subsequent test fail then 100% of tension bolts will be tested prior to their use. If a situation is reached where over 25% of the bolts have failed, then testing will be discontinued and the contingency plan employed. If all four initial tests fail then no further testing will take place and again the contingency plan will be employed. Where a bolt in an anchor fails the testing, all four bolt anchors at that post position will be replaced with HAPAS approved drilled in bonded anchors. The anchorages to be tested shall be selected by the inspecting engineer and should be representative of those observed to be potentially the weakest. Any anchor with signs of damage or significant corrosion shall not be re-used. The test load to be used for each anchorage shall be determined by the designer and specified to the contractor. The test load to be applied shall be 1.1 times the tensile force in the bolt obtained from the un-factored failure moment of the parapet post. The two possible contingencies in the case of the existing anchors failing to reach sufficient capacity are as follows: a) Remove the failed anchors by over-coring and fix new HAPAS anchors into the holes created. b) Drill in four new HAPAS anchors within 100mm of the existing post centrelines, and therefore still within the areas of increased reinforcement. All replacement anchors will be tested in accordance with the Specification for Highway Works.
B	**Rejected Options**	N/A

5) DESIGN ORGANISATION'S CONCLUDING REMARKS

The approval of this Departure will enable the Highways Authority to minimise Network User delays and avoid significant expenditure on extended preliminaries on site. The control measures proposed will significantly reduced the likelihood of any of the risks identified being realised.

6) ATTACHMENTS & OTHER INFORMATION

A	**List of Attachments**	Parapet Detailed Drawing. Drawing 012818/SP1978 Rev C
B	**Consultations**	N/A
C	**Other information**	A similar scheme has just been completed on the A6500 where the sub standard BACO parapets were replaced using the existing anchorages. The structures were constructed as part of the same contract and the anchorages are assumed to be identical, On the previous scheme all of the anchorages passed the in-situ tests.

7) DECISION

NAME 1	Andrew James	**ROLE**	Senior Structures Advisor	**SIGNED**		**DATE**	06/06/07
NAME 2	Richard Camden	**ROLE**	Engineering Division Director	**SIGNED**		**DATE**	09/06/07

TICK ONE BOX:	**1 - APPROVED**		**2 - APPROVED WITH COMMENTS**	✓	**3 - REJECTED**	

COMMENTS	Visual inspection of the existing cradle sockets is required by a competent qualified engineer to determine the suitability of the anchorages for reuse and to ensure that there is no significant corrosion or damage Any anchor with signs of damage or significant corrosion should not be reused. It is important to ensure an extra 5mm of thread engagement such that any corrosion in the future, which is generally restricted to the very top of the cradle socket, is allowed for. In order to prevent possible failure of the bolting due to stripping of the threads in the existing sockets it will be necessary to ensure that an engagement length of the bolt into the socket is provided in accordance with clause 6.6.4 of BS 6779 Part 1 : 1998. Pull out tests in accordance with the SHW will be required for all replacement drilled in anchorages as well as for existing cradle anchorages Existing anchorages should only be used if they are of a cradle type. The anchorages to be tested should be selected by the inspecting engineer and should be representative of those observed to be potentially the weakest.

SUBMISSION FOR DEPARTURE FROM STANDARDS [EXAMPLE 3]

PROJECT NAME	A87 Oak Way and New Cut Road Junction Improvement
APPLICANT ORGANISATION	Truman and Tillman
APPLICANT REF	76844
HIGHWAY AUTHORITY REF	A87/DFS/GEOMETRY/001
CONTACT DETAILS	Andrew Byrne (Project Manager) – a.bryrne@tat.com
DATE SUBMITTED	01/02/10

1) PROJECT DETAILS

A	**Description**	It is proposed to remove the simple T-junction at New Cut Road with the A87 and construct a new Major-Minor junction with deceleration length and merge taper to TD 42/95
B	**Location**	Junction of A87 Oakway and New Cut Road
C	**Road category and type**	Dual two lane
D	**Design speed and speed limit**	120kph design speed and 70mph speed limit
E	**Traffic and NMU flows**	16,500 AADT.

2) DEPARTURE DETAILS

A	**Discipline**	Geometry
	Type	Weaving length
B	**Relevant Standard(s)**	TD 22/06 Layout of Grade Separated Junction
	Clause	Para. 4.36
C	**Difference between Standard(s) and Proposed Design**	TD22/06 states that for Rural All-Purpose Roads the desirable minimum weaving length must be 1km. The required 1km weaving length cannot be achieved due to the proximity of New Heights Junction and Williams Lane Junction. The end of the merge taper for the proposed junction is approximately 475m upstream of the start of the diverge taper at Williams Lane. Therefore, the maximum weaving length that can be provided is 475m
D	**Reason for Departure (overview)**	It is not possible in this case to comply with standards without closing a junction or moving it a considerable distance.
E	**Associated Project Departures**	N/A

F	**Other options considered**	In order to remove the below standard weaving length it would be necessary to either, (1) Remove the merge slip at New Cut Road, (2) Remove the diverge slip at New Heights, or (3) Provide a separate local access road parallel to the existing A87 between the two junctions. For the following Reasons, these options have been rejected: Do nothing option. Although traffic modelling shows that there is no normal demand flow (and hence no requirement for a merge taper from New Cut Road up to year 2033 under normal conditions, a known regular flooding problem on Leaton Road can make it impassable. The alternative route is via New Cut Road as the only means of access to the existing A87 for Leaton residents during times of flooding. Removal of the merge slip road would take away this alternative route. When this diversion occurs, sometimes 2 or 3 times per year the flow warrants a merge taper rather than a priority arrangement. Removal of the diverge at New Heights would require a significant diversion route for traffic travelling to New Heights via Leaton Road. The proposed narrow cross section of the diversion route with passing places would not be suitable for this increased level of traffic and would require upgrading to full width carriageway. The known flooding problem in Leaton would make this route impassable during flood periods. Provision of a parallel local access road would require the construction of approximately 1km of carriageway, for which the traffic modelling shows no demand during normal conditions. This would require significant additional land take and increased construction costs to provide a link for a very low demand flow.

3) JUSTIFICATION (POTENTIAL POSITIVE AND NEGATIVE IMPACTS)

A	**Safety**	The accident rate of the existing junction is consistent with norms for the type of junction. As is expected the majority of accidents in the past have been associated with right turning vehicles (5 from a total of 8 in the last 3 years). These accidents are unlikely to be affected by the scheme. Visibility at the improved junction will be as per TD42 and TD9 requirements. In the proposed arrangement vehicles merging from New Cut Road could be struck by vehicles moving into Lane 1 that are already preparing to diverge at New Heights. Advanced signing on the A87 would alert vehicles on the A87 of the presence of both junctions. Signs will be positioned such advanced signing for the downstream junction will only commence after road users have passed the upstream junction. The proposed layout is not novel and would be easily understandable to road users.
B	**Congestion/ delay**	Although existing queue delays are only around 20 seconds at peak times, these are likely to reduce if the departure is accepted.
C	**Environmental/ Sustainability**	The departure would avoid extensive additional civils work and negate the need for additional land take and the removal of mature trees (for the rejected alternatives).
D	**Capital and Whole Life Cost/Value**	There will be a significant cost saving with the departure than the implementation of any of the alternative options detailed in section 2F
E	**Accessibility**	The route carries an occasional bus service (Service No. 88, running once an hour) that turns right from the junction. The new merge lane will clear short existing queues quicker (for left turners) providing a modest time saving for the

		bus service.
F	**Integration**	N/A
G	**Structural**	N/A
H	**Network Resilience & Maintenance**	The departure would potentially mean that the junction of New Cut Road can remain open and access to the Leaton area can be maintained during flooding The departure will potentially save the introduction of new carriageway which would present the authority with an additional maintenance liability.

4) COMPENSATORY MEASURES

A	**Included Measures**	The existing lay-by between these junctions would be closed as part of this scheme. An assessment of usage of this facilities and other nearby facilities shows that this is unlikely to create a shortage of stopping places.
B	**Rejected Options**	N/A

5) DESIGN ORGANISATION'S CONCLUDING REMARKS

This departure proposes a junction layout which would not provide the 1km weaving length required by the DMRB between junctions. The disbenefit in terms of reducing weaving length does not offset the benefits of reduced construction cost, minimal disruption to road users and environmental savings in what is considered by the Designer to be a low safety risk imposed by the introduction of this departure.

6) ATTACHMENTS & OTHER INFORMATION

A	**List of Attachments**	Drawing 69068/TP/SK009 – Existing layout showing distances between junctions Appendix A – New Heights Accident Data Appendix B – New Cut Road AM and PM Peak Demand Flows Appendix C - Risk Assessment
B	**Consultations**	N/A
C	**Other information**	N/A

7) DECISION

NAME 1	Alex Charmers	**ROLE**	Highways Manager	**SIGNED**		**DATE**	01/03/10
NAME 2	Richard Camden	**ROLE**	Director for Transport and Environment	**SIGNED**		**DATE**	04/03/10

TICK ONE BOX:	**1 - APPROVED**	✓	**2 - APPROVED WITH COMMENTS**		**3 - REJECTED**		
COMMENTS	No comments.						

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SUBMISSION FOR DEPARTURE FROM STANDARDS [EXAMPLE 4]

PROJECT NAME:	A87 Long Brow Road, B5999 Tib Road Grade Separated Junction
APPLICANT ORGANISATION:	Atom Consultants
APPLICANT REF	6496
HIGHWAY AUTHORITY REF	B599/DFS/GEOMETRY/002
CONTACT DETAILS:	Russell Rees (Consultant Engineer) – r.rees@atom.co.uk
DATE SUBMITTED	08/04/09

1) PROJECT DETAILS

A	**Description**	It is proposed to introduce a grade separated junction to replace the existing at grade-junction at A87 Long Brow Road / B5999 Tib Road interchange. The new grade separation layout for the trunk road consists of a dumbell roundabout arrangement on the local road network.
B	**Location**	Junction of A87 Long Brow Road / B5999 Tib Road
C	**Road category and type**	D2AP - Dual 2 Lane carriageway – All Purpose trunk road (A87) Single carriageway with no hardstrips (B5999)
D	**Design speed and speed limit**	70kph for B5999
E	**Traffic and NMU flows**	20,000 AADT (A87) 3,000 AADT (B5999). The B5999 has no footways and the verges are not regularly used by pedestrians. No desire line for on foot or cyclist crossings is present.

2) DEPARTURE DETAILS

A	**Discipline**	Geometry
	Type	Horizontal Radius and Sight Stopping Distance
B	**Relevant Standard(s)**	TD9/93
	Clause	1.24
C	**Difference between Standard(s) and Proposed Design**	The proposed B5999 alignment incorporates an existing horizontal radius of 150m, which represents more than 2 steps below the desirable minimum horizontal curvature for a design speed of 70kph. In addition, a sight stopping distance (SSD) of only 110m is achievable to a low object of 0.26m as opposed to the desirable minimum of 120m.
D	**Reason for Departure (overview)**	Due to site constraints the substandard horizontal curvature and SSD is proposed in combination.
E	**Associated Project Departures**	N/A
F	**Other options considered**	The option of realigning the B5999 to achieve the minimum desirable horizontal radius as detailed in TD9/93 was considered, but rejected due to the reasons outlined in sections 3 and 4

3) JUSTIFICATION (POTENTIAL POSITIVE AND NEGATIVE IMPACTS)

A	**Safety**	The reduced horizontal curvature means that there could be a risk of vehicles entering the curve faster than the design speed and losing control. In addition, the substandard SSD means that motorists may not be able to see low objects i.e. 0.26m, within the minimum desirable distance of 120m. As this is a junction location, queuing vehicles are expected. The compensatory measures detailed in section 4 will significantly reduce the likelihood of vehicle entering the curve too fast. The accident record shows no loss of control accidents at this curve over the last 5 years. The new layout is unlikely to affect the risk of loss of control detrimentally. The achieved SSD is not considered a significant risk. This is because 120m of visibility is achieved for objects 0.55m and higher, therefore vehicle lights will be visible. Additionally there will be sufficient signs to alert road users to the junction location and form. Vehicle Speeds have been measured (as described in TA 22/81) on the B5999 and the survey shows that the 85%ile speed is consistent with the design speed for the road. The road width varies down to a minimum of 6.0m immediately south of the tie-in. Through this section of the B599, visibility is restricted to a level below standard as a result of the narrow verges and existing rock cutting. Therefore, the proposals maintain the geometric standards appropriate for the likely vehicle speeds and do not create a situation worse than already exists along this section of the route.
B	**Congestion/ delay**	N/A
C	**Environmental/ Sustainability**	Implementing the substandard horizontal curvature will significantly reduced the impact on the environment by reducing the extent of new carriageway required and the need to take additional greenbelt land. The proposals will reduce the number of lighting columns required and therefore reduce energy consumption and pollution over the life of the proposals.
D	**Capital and Whole Life Cost/Value**	There will be a significant saving in terms of reduced material and construction costs. A fully compliant layout would increase construction costs by round £360,000. Although this funding could be sought from the trunk authority, this sum would represent a significant increase on the overall works cost for the junction scheme and would impact on the benefit to cost ratio substantially. The whole life costs of the scheme will also be reduced with the reduction in the number of lighting columns and maintenance requirement.
E	**Accessibility**	N/A
F	**Integration**	N/A
G	**Structural**	N/A
H	**Network Resilience & Maintenance**	The proposals will reduce the extent of the works and therefore the scheme will be able to be completed sooner than otherwise and the network can be up to full capacity sooner. Maintenance will also be reduced due to the reduction of new infrastructure to be maintained.

4) COMPENSATORY MEASURES

A	**Included Measures**	Superelevation of 7% has been proposed as recommended in TD9/93 for a curve of this standard. The presence of street lighting on the section of the road concerned will improve conspicuity of other vehicles / obstacles ahead. Chevron signs will be installed on the roundabout using a mounting height that ensures they will be visible at a distance of 120m from the roundabout.
B	**Rejected Options**	N/A

5) DESIGN ORGANISATION'S CONCLUDING REMARKS

The departure is considered the best compromise between minimising the impact of the road on the local surroundings whilst maintaining geometric standards appropriate for the likely vehicle speeds. The compensatory measures detailed in section 4 should mean that the risk associated with introducing the substandard curve radius is significantly reduced to warrant its introduction.

6) ATTACHMENTS & OTHER INFORMATION

A	**List of Attachments**	General Arrangement of proposed works. Drawing 01199/B5999/012 Rev C
B	**Consultations**	N/A
C	**Other information**	N/A

7) DECISION

NAME 1	John South	**ROLE**	Senior Highway Engineer	**SIGNED**		**DATE**	28/04/09
NAME 2	Fred Upton	**ROLE**	Head of Highways and Environment	**SIGNED**		**DATE**	05/05/09

TICK ONE BOX:	**1 - APPROVED**	✓	**2 - APPROVED WITH COMMENTS**		**3 - REJECTED**		

COMMENTS	No comments

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SUBMISSION FOR DEPARTURE FROM STANDARDS [EXAMPLE 5]

PROJECT NAME	B6999 Gale Lane Railway Bridge
APPLICANT ORGANISATION:	Stimpson Design Solutions Ltd
APPLICANT REF No	6416
HIGHWAY AUTHORITY REF	B6999/DFS/GEOMETRY/001
CONTACT DETAILS	Thomas Bongard (Consultant Engineer) – t.bongard@Stimpsonds.co.uk
DATE SUBMITTED	22/06/10

1) PROJECT DETAILS

A	**Description**	Structural inspections to Gale Bridge on the B6999 have found it to fail in a number of key categories and will require bridge deck and bearing replacement on existing substructures.
B	**Location**	B6999 Gale Lane Railway Bridge, Lowing – 1.6km north east of Penny Lane
C	**Road category and type**	S2 – Single lane carriageway with hardstrips (no hardstrips on bridge)
D	**Design speed and speed limit**	100kph
E	**Traffic and NMU flows**	6000 AADT. NMU data shows up to 200 pedestrians a day use the footway on the existing bridge which forms an important link between the railway station, village and post office.

2) DEPARTURE DETAILS

A	**Discipline**	Geometry
	Type	Cross-section
B	**Relevant Standard(s)**	DMRB Vol 6 Section 1 Part 2 – TD27/05
	Clause	4.2.1 (fig.4.4a)
C	**Difference between Standard(s) and Proposed Design**	The standard requires that the carriageway width is 7.3m (3.65m lanes). It is proposed to introduce a 7.0m carriageway width (3.5m lanes) with no hardstrip.
D	**Reason for Departure (overview)**	The existing carriageway width across the existing bridge is 7.0m, which does not conform to standard. The width of the footway provisions across the bridge is also substandard, with the north side footway measuring 600mm and the south side footway measuring 900mm. With the construction of the new bridge deck, it is proposed to re-introduce the carriageway width at 7.0m for the reasons detailed in section 3. There is one pedestrian desire line along the south side of the bridge, which experiences a high daily pedestrian flow and provides a link to the railway station and post office. As the design speed of the road is 100kph, it is considered important for pedestrian safety that the footway provision over the bridge is brought up to a reasonable standard as part of these works. Therefore, it is proposed to widen the southern footway to the recommended minimum width of 1.2m used with the highway network for Trumpton Council. The other footway will be retained with a below standard width.

E	**Associated Project Departures**	N/A
F	**Other options considered**	The option of implementing a wider bridge deck to accommodate a 7.3m wide carriageway (with and without hardstrips) was considered but rejected on the grounds of safety and cost (see section 3A and 3D). The option of increasing both footways was considered. However there is little desire line on the north side and the increased width would have required additional construction works to substructures.

3) JUSTIFICATION (POTENTIAL POSITIVE AND NEGATIVE IMPACTS)

A	**Safety**	The carriageway width along the B6999 varies between 7.0m and 7.3m along its entire length but is generally 7.3m without hardstrips on approach to the bridge. In light of this, not increasing carriageway width on the bridge to 7.3m will have no significant impact on safety and will not make it any worse than the current situation. In addition to the above, the PIA records for the past three years show a small number of instances of overtaking accidents (2 in 5 years) along the B6999 in the vicinity of the bridge. In light of this, there is a strong case for not providing a 7.3m carriageway with hardstrips as it may further encourage overtaking manoeuvres on a route that generally has poor overtaking provision. There are no reported pedestrian casualties in the last 5 years. Improved footway provision will improve safety for pedestrians crossing the bridge and will significantly improve the situation for users of wheelchairs or pedestrians pushing prams where the current width is unattractive.
B	**Congestion/ delay**	The necessary possessions have been negotiated with Network Rail. The works can be substantially be accommodated in a series of railway possessions over a single Christmas period. This is reliant on a minimum of works to substructures. Any other design (e.g. for wider deck) will result in increased possessions.
C	**Environmental/ Sustainability**	N/A
D	**Capital and Whole Life Cost/Value**	Introducing the carriageway width at 7.0m as opposed to the 7.3m will provide a significant cost saving of approximately £30,000. Whilst the existing substructure could accommodate this increase in width a direct cost of £100,000 would be associated with substructure works for a widened north footway and £200,000 for hardstrips. Each additional rail possession would also cost in the order of £100,000.
E	**Accessibility**	The wider south footway provision will improve conditions for pedestrians, wheelchair users and those with prams
F	**Integration**	N/A
G	**Structural**	N/A
H	**Network Resilience & Maintenance**	N/A

4) COMPENSATORY MEASURES

A	**Included Measures**	The existing narrow north footway will be provided with cobbled features to discourage use.
B	**Rejected Options**	N/A

5) DESIGN ORGANISATION'S CONCLUDING REMARKS

Although classed as an improvement, the principle of the project is to put back only what is necessary so as to match the existing situation. The approval of this departure will reduce costs, reduce rail possessions and is not associated with any significant residual risks.

6) ATTACHMENTS & OTHER INFORMATION

A	**List of Attachments**	General Arrangement of proposed works. Drawing 501790/600/02
B	**Consultations**	Project discussed with Mr Andrew Townsend of Network Rail (Rugby office) in December 2009 and technical approval authority (Mr Robert Jones) in October 2009.
C	**Other information**	N/A

7) DECISION

NAME 1	Ben Tyreman	**ROLE**	Highways Manager	**SIGNED**		**DATE**	23/07/10
NAME 2	Robert Moore	**ROLE**	Highway Group Leader	**SIGNED**		**DATE**	25/07/10

TICK ONE BOX:	**1 - APPROVED**		**2 - APPROVED WITH COMMENTS**	✓	**3 - REJECTED**		

COMMENTS	The existing carriageway structure is known to pond during rainfall from time to time. Although we are aware that new drainage will be included at deck level, it is advised that the condition of the carrier pipes is checked during rail possessions to ensure that they are in good repair and free from debris.

Annex E
Notes for Guidance when completing Departure Proforma

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ANNEX E: NOTES FOR GUIDANCE WHEN COMPLETING DEPARTURE PROFORMA

E1. APPRECIATION OF LAYOUT, TRAFFIC CONDITIONS AND ROAD SAFETY CONSIDERATIONS

Consideration should be given to the effect of the Departure from Standard on the safety and operation of the improved length of road and its compatibility with adjacent sections of the route in terms of its current and known future strategy; e.g. future operational performance requirements.

Account should be taken of the functional classification of the road, the amount and character of the traffic, the type of scheme, and the accident history of the road.

A key factor in consideration of safety is the perception of the road user. This will be influenced by a number of factors including: the general topography and roadside land use; the layout and nature of the road upstream and downstream of the Departure site; forward visibility; conflicts in traffic movements; warning and advisory traffic signs; road markings; and the presence and effectiveness of street lighting.

Thought should be given to the ability of all vehicular and non-motorised road users (including drivers entering from side turnings and pedestrians, cyclists and equestrians crossing the road) to realise the presence of motor vehicles approaching and to have sufficient time and space in which to carry out their own manoeuvre.

Recent accident trends suggest that mopeds and motorcycles are over-represented in statistics and therefore powered two wheelers should be given careful consideration when considering Departures, particularly for horizontal curvature. Advice has been published by IHIE in their 'Guidelines For Motorcycling' (April 2005).

E2. ACCIDENT ANALYSIS

Where a Departure relates to an existing feature within an improvement scheme, an evaluation of the accident history of the relevant section should be considered. An exhaustive analysis of existing accidents may prove worthless for schemes that substantially alter the layout, but is suggested that the non-provision of detailed analysis is agreed via a positive decision rather than inadvertent omission.

Any accident analysis[26] should consider the type of accident, severity, contributing circumstances, environmental conditions and time of day. A short report with the conclusions of this analysis should be produced, with the most salient points summarised within the Departure application.

In a similar way, the likely overall accident savings of a proposed layout may form part of the justification for a Departure from Standard i.e. where rejection of a Departure would render construction of a worthwhile safety scheme impractical and give rise to continuing accident problems.

[26] Design Organisations should make good use of predictive models in junction design software.

E3. BUILDABILITY CONSIDERATIONS

The Design Organisation must consider whether the proposed works, including Departures, can be constructed safely and in accordance with Health and Safety legislation. The CDM Regulations require the application of foresight to consider what hazards exist and to ensure, as far as is reasonably practicable, that these are either eliminated or managed effectively through the process of risk assessment. Non-compliance with the CDM Regulations by organisations or individuals is a criminal offence.

Sometimes, however, the approval of a Departure may significantly reduce exposure to risks for operatives and road users during construction.

E4. MAINTENANCE CONSIDERATIONS

The Design Organisation also has a legal duty under the CDM Regulations to ensure that what is built can be safely maintained. Experience shows that a project designed with sufficient consideration given to future maintenance (including design elements requiring Departures from Standard) will overall operate more effectively and safely.

Where a Departure is perceived to potentially affect the safety, efficacy or efficiency of maintenance the Design Organisation should document the consideration of maintenance implications and consult with the relevant maintenance organisation about each proposed Departure. If a maintenance organisation has yet to be appointed, the designer should make an assessment in consultation with the existing maintainer.

It is imperative that Design Organisations understand how maintenance of a particular scheme fits into the maintenance regimes for a route or section of the network or the adjacent local authority network. Suitability of diversion routes and awareness of the plant utilised for particular maintenance functions may have a direct impact on whether a proposed Departure is justified.

Checks should be made to ensure that layouts are capable of safe and satisfactory operation during maintenance works requiring lane closures or contraflow working by considering the necessary traffic management measures, including temporary signing. Routine maintenance activities also require access to structures and ancillary items such as drainage, signs, lighting, signalling equipment, telephones, planting and mown areas. For winter maintenance activities[27], consideration should be given to ploughed snow storage, salting routes and diversion routes.

The higher risks associated with working at height, working adjacent to live traffic and confined space working are most likely to be the focus of this element of the application. While these risks should be eliminated or reduced as far as possible, they are all familiar problems that are managed on a regular basis by competent contractors and therefore the existence of activities associated with these risks is not normally reason enough for non-approval of a concept.

The Design Organisation shall assess the likely risks arising from future maintenance considerations and report their findings as part of the Departure application. Particular care should be taken to assess whether some existing risks will worsen as a result of the proposed Departure.

[27] This would include identification of “hard to reach” locations or features. However this must always be balanced by considering the potential low frequency of any winter problems.

It is noted that consultees do not have a “veto” on Departures or design decisions and therefore problems identified by maintainers should not necessarily constitute a permanent barrier to the progression of a Departure.

E5. ENVIRONMENTAL CONSIDERATIONS

Any resultant impact of applying the full Standard on scenic, historic, or other environmental features should be examined. Similarly the impact of the Departure should be assessed and compared against the standard provision.

Environmental aspects to be considered include noise, visual impact, designated sites, biodiversity, potential pollution and sustainability.

E6. STRUCTURAL CONSIDERATIONS AND PRODUCT RELATED CONSIDERATIONS

Where a proposal refers to the use of a particular propriety system or use of a new material or new construction technique it would be normal to provide evidence of testing or successful use elsewhere. On occasion it would be appropriate for manufacturers to supply information to assist designers. This may include the supply of warranties.

Standards for assessing structural strength and loading may contain conservative assumptions that are not always fully appropriate for specific circumstances. Departures from Standard are not uncommon to vary the calculation technique, often utilising fundamental engineering principles to justify higher levels of confidence for the application of lower (factored) loading values[28] or resultant factors of safety that would be applied by direct application of standards alone. In such cases it would not be expected that calculations are submitted as a component part of the submission. The potential mode of structural failure should be carefully considered in any structural Departures.

Departures that limit future personnel access to components that require inspection or maintenance would require very careful consideration and in the case of inspection may necessitate some remote form of monitoring.

New structures are often designed for very long life expectancies. Departures that are related to systems that are intended to protect the structure from deterioration mechanisms would normally require careful consideration of the whole life cost model and the sensitivity of assumptions of longevity of such systems.

Standards are normally written to provide generic advice on the performance of products. Departures applications (at the design stage) that specify particular products may breech European procurement directives.

E7. NETWORK RESILIANCE CONSIDERATIONS

Departures that are associated with the potential risks of low frequency but high impact events, such as incursion onto railways, highway flooding or structural failure are often the most difficult to assess. Common with all risk assessments the quantum of the disbenefits is an important consideration, so although a high impact event may be problematic in terms of severity, any expected low frequency will moderate the assessment of overall impact. Whilst it is important to consider such

[28] For example, accurate calculations for dead loading

events[29] and avoid them if possible, it is not normally necessary to design-out every conceivable risk.

E8. CROSS-DISCIPLINE ISSUES AND OTHER CONSIDERATIONS

Some Departures require the input of different specialists within the Design Organisation. Also occasionally different highway authority officers may need to input where an issue affects different policy areas e.g. maintenance. It is suggested that the Design Organisation gathers the views of all the relevant highway authority staff. Where conflicting viewpoints are revealed the Project Manager should be asked to advise taking into account the scheme objectives.

Departures should not be considered in isolation. Account should be taken of any associated Departures and Relaxations (whether existing or proposed), nearby novel or distracting features, and the nature of the route in the area in question. The influences and effects of such other aspects adjacent to, or likely to interact with, a Departure should be fully assessed and identified in the application. Any Departures approved previously should be included in this assessment

E9. COMPENSATORY MEASURES

As with any non-standard situation, Design Organisations should consider suitable measures to reduce risks associated with any potential adverse effects of the Departure. Compensatory measures may not always be needed and should not be introduced as an automatic response to a Departure from Standards. In some cases a watching brief may be appropriate in the early post-opening stages of a scheme.

Compensatory measures to consider would include:

- high friction or coloured surfacing[30]
- additional signing[31] or markings
- speed reduction measures
- road restraints (barriers)
- measures for the most vulnerable (non-motorised users, powered two wheelers)
- technology
- changes to operating (including maintenance) regimes such as increased frequency

Compensatory measures need to be appropriate for the individual location whilst being consistent with the wider route design. Care should be taken since compensatory measures on one scheme (e.g. bend warning signs) may create

[29] Including effects on other transport networks

[30] Such material may need replacing frequently and once installed may generate a high ongoing cost burden. A traditional surfacing with a high polished stone value may prove to be more cost effective. Where colour is required to highlight particular issues, pigmented asphalt may be specified without the additional expense of high friction material.

[31] Over-use of signing is not encouraged. The Traffic Signs Manual emphasises that warning signs are only appropriate in limited cases. Simply because there a Departure from Standard does not automatically imply that a test has been passed to allow signing to be placed. The courts have repeatedly noted that whilst highway authorities have the power to erect signs, they do not have a duty to do so.

driver expectation for similar measurers elsewhere in circumstances where they are not justified.

Where particular compensatory measures were considered for inclusion, but subsequently not proposed by the Design Organisation it is often useful to record the thought process and reasoning to demonstrate the thoroughness of the assessment. This may also avoid the highway authority suggesting ideas that have already been ruled out.

It is essential that the Design Organisation states exactly what compensatory measures are included in the design in order that the Project Manager can ensure that these are not varied during the construction phase.

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Disclaimer

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