


Design of Minor Improvement Schemes
NRA TA 85/13

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Training for New Developments
April 2013

ARUP

KILDARE nro NATIONAL ROADS OFFICE

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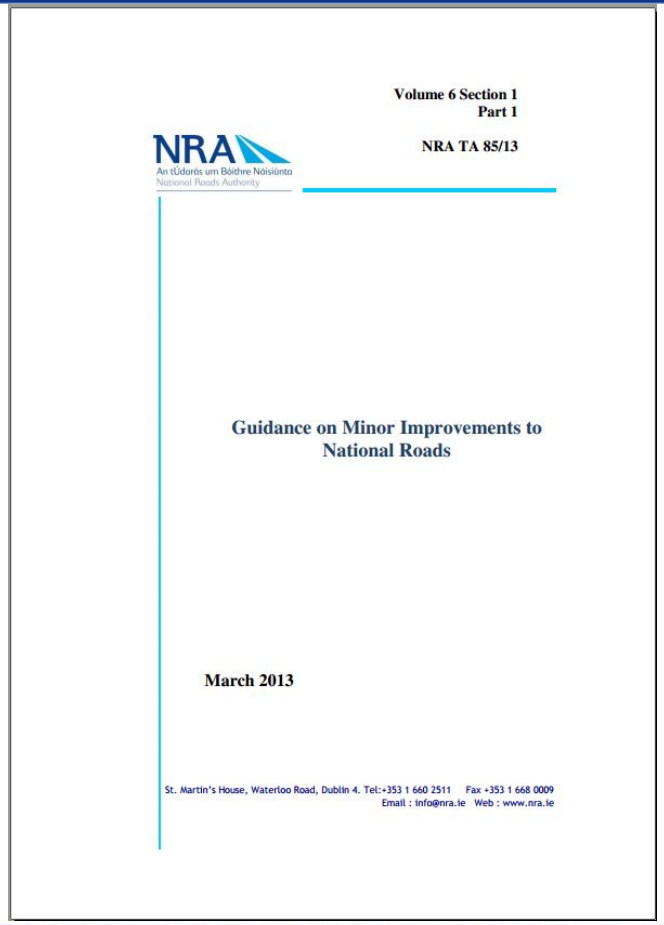
What is NRA TA85/13?



Volume 6 Section 1
Part 1

NRA TA 85/13

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National Roads Authority

Guidance on Minor Improvements to National Roads

March 2013

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What is NRA TA85/13? - Purpose

It is a Technical Advice Note that provides guidance on the design principles to be considered when implementing Minor Improvement and Road Safety Improvement Schemes on National Roads

It supersedes the previous version, NRA TA85/11

Published on the 22nd March 2013

Available to download at
http://nrastandards.nra.ie/nra-dmrb-documents

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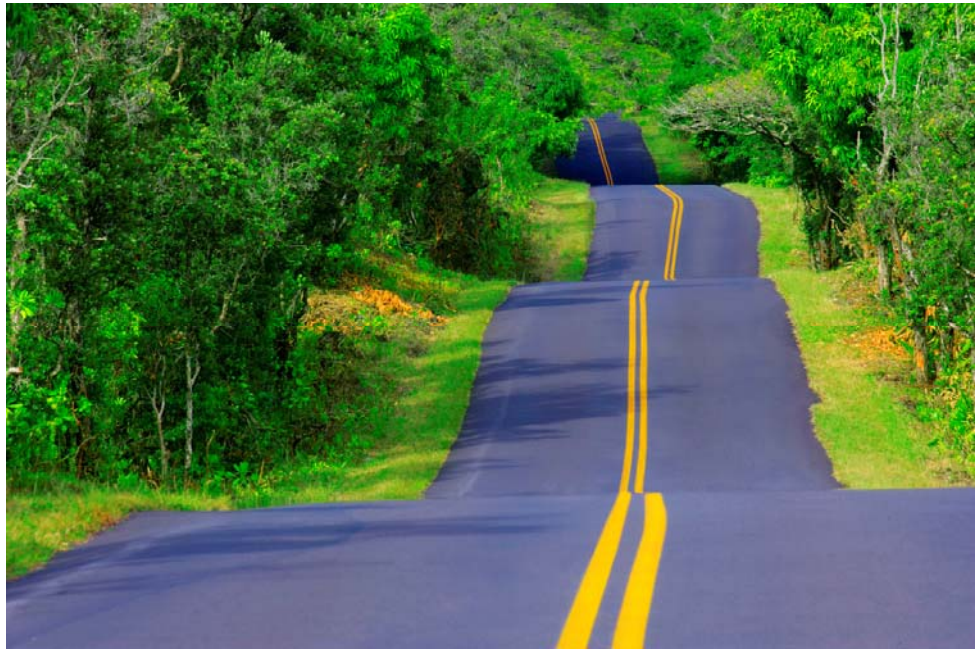
NRA TA85/13 - History

- First iteration of this was NRA IAN 85/06
  - Used 3 categories of Minor Improvement
  - Set out the design procedure for the categories of road
- Then came NRA TA85/11
- Now we have NRA TA85/13

What does it apply to?



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What does it apply to?

- For Minor Improvement Schemes
- For Road Safety Schemes

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What does it not apply to?

- Not to be used on roads upgraded as part of Major Improvement Schemes
- Not to be used on Maintenance Schemes

Main differences between 2011 version and 2013 version

- The means of dealing with Departures from Standards is changed in 2013 version

- Designers are required to consider the risk assessment in Chapter 8 of NRA TD19 – Safety Barriers

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Definitions

Minor Improvement Scheme

"an upgrade to an existing section of sub-standard road less than 2km in length where a design element or combined set of design elements are improved."

Definitions

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Minor Improvements

- The objective of a minor improvement scheme on an existing road is to achieve a localised improvement appropriate to, and consistent with, the characteristics of the adjacent sections of the route having regard to road user demand, collision history and design speed. (Route Consistency)
- Minor Improvement Schemes should be designed
  - to improve road safety and
  - make better use of the existing road network

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Minor Improvements

- The objective of a minor improvement scheme on an existing road is to achieve a localised improvement appropriate to, and consistent with, the characteristics of the adjacent sections of the route having regard to road user demand, collision history and design speed. (Route Consistency)
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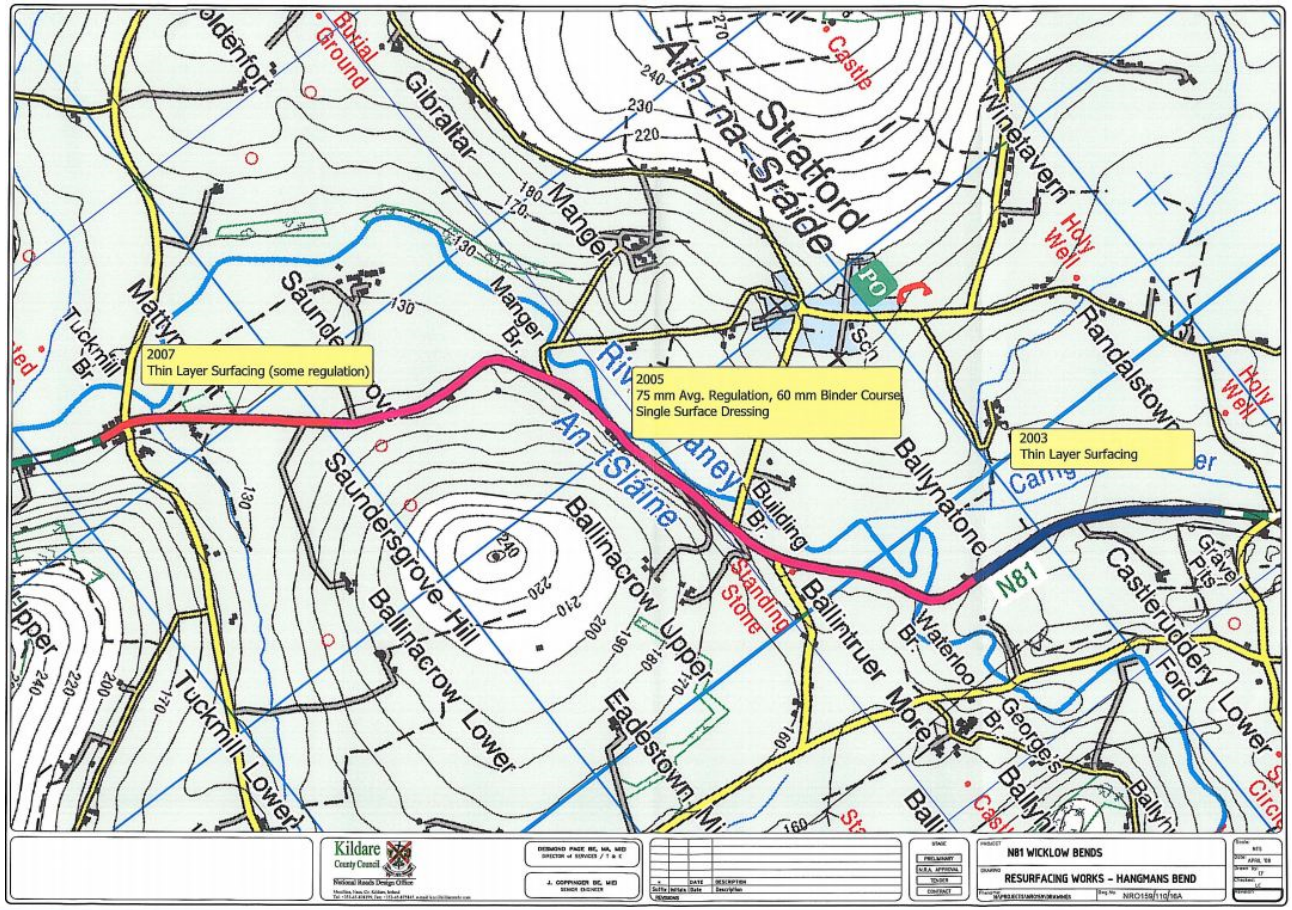
Minor Improvements – Hangmans Bends

Length = 1175m
Accidents:
1 Fatal
3 Injury



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Minor Improvements (contd.)

- Examples of elements that may be improved would include:
  - applying superelevation in accordance with NRA TD 9
  - improving vertical and horizontal alignment
  - upgrading of the road cross-section
  - sightline improvements at junctions

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Definitions

- **Road Safety Improvement Scheme**

  "a Scheme that specifically targets sections of the network with high collision rates to improve road safety"

Road Safety Improvement Scheme (contd.)

- **What is affected in the Road Safety Improvement Scheme?**

  "…a design element or combined set of design elements are improved to reduce the frequency and or the severity of collisions occurring in the future"

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Aim of Schemes

- **Route Consistency**

"…achieved by a route improvement appropriate to and consistent with characteristics of the existing road alignment"

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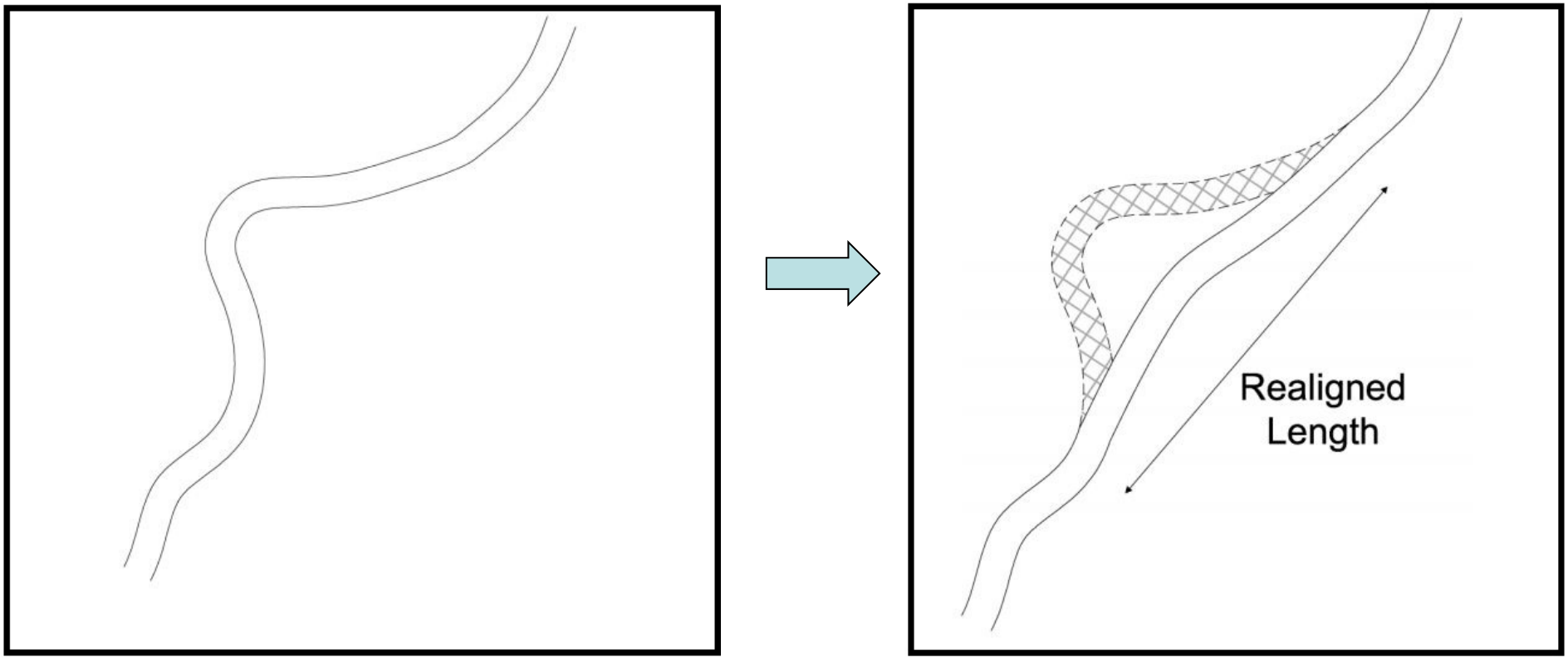
Aim of Schemes

- **Route Consistency**

"…achieved by a route improvement <u>appropriate</u> to and <u>consistent</u> with characteristics of the existing road alignment"

Aim of Schemes
Route Consistency



Aim of Schemes
Route Consistency

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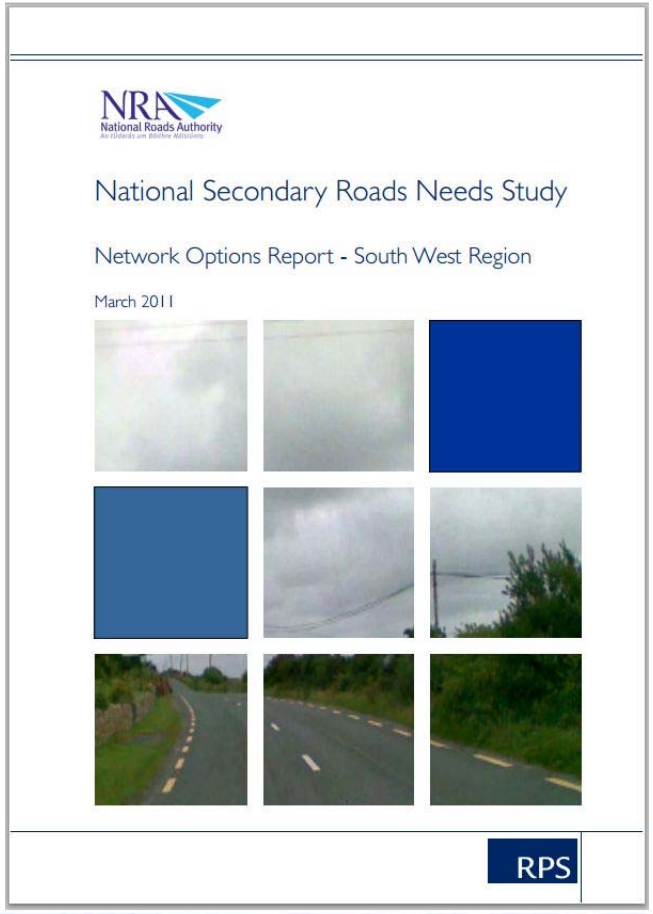
Aim of Schemes
Route Consistency



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Definitions

Maintenance Schemes

"Maintenance Schemes predominantly involve pavement works and other road feature maintenance works "

Definitions

Maintenance (contd.)

This covers elements such as:

- overlay and inlay works which regulate the camber of the existing road;
- the introduction of new traffic signs and road markings;
- edge strengthening of an existing road

NB: These scheme are not covered by NRA TA85

Who is the Road Authority?

- For Minor Improvement Schemes, the Road Authority shall be the relevant Local Authority responsible for the Scheme
- Why is this important?
  - It is the Road Authority who submit the Preliminary Design Report for approval.

Preliminary Design Report

- **Purpose**

"…address and present issues relating to compliance with the relevant parts of the NRA DMRB for the options considered"

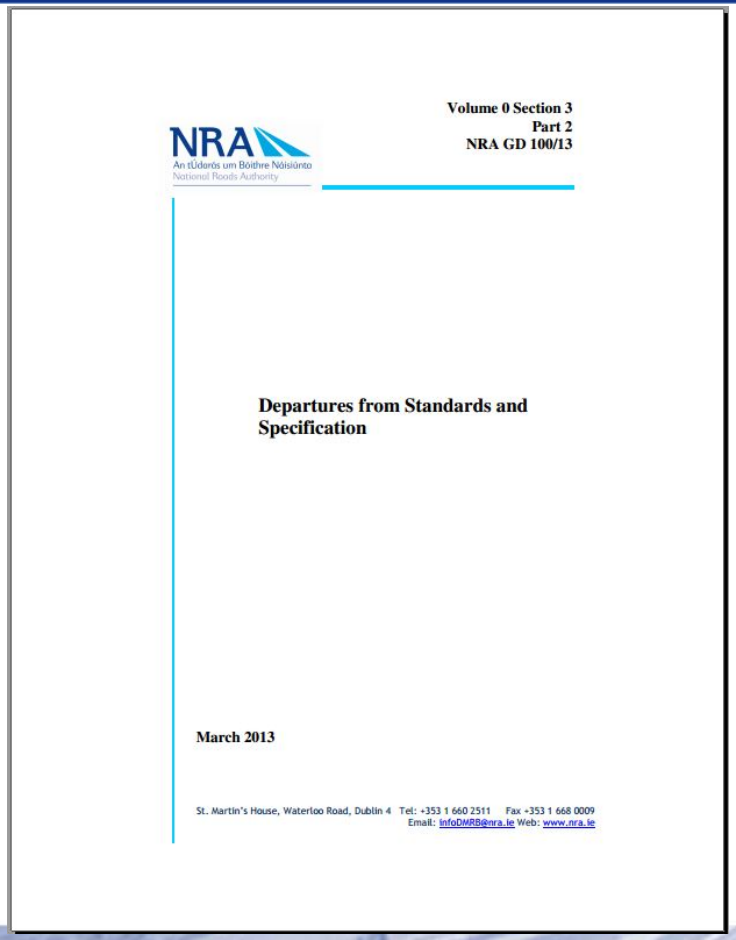
Preliminary Design Report (contd.)

Need for the Scheme	Safety Barrier Risk Assessment
Specific Objective of the Scheme	Drainage Requirements
Collision History and Record	Traffic Signs and Road Markings
Design Speed Calculations	Junction Treatment
Options Considered	Requirements of Non Motorised Users
Geometric Features	Relaxations and Departures
Road Safety Audit	Preliminary Design Drawings

Preliminary Design Report (contd.)

- The Preliminary Design Report is your friend!
- It records, contemporaneously, all the decisions which were made at the time you were going through the design process

Preliminary Design Report (contd.) – Departures NRA GD100/13



Volume 0 Section 3
Part 2
NRA GD 100/13

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Departures from Standards and Specification

March 2013

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Departures

What is a Departure?

- Departure from any of the mandatory requirements of the NRA DMRB
- The use of design standards other than those in the NRA DMRB;
- The use of technical specifications for materials or workmanship other than those in the NRA Specification and the NRA RCD
- The use of a set of requirements or additional criteria for any aspect of the Works for which requirements are not defined in the Contract

Departures (contd.)

General

Junctions

2.1 Major/minor priority junctions are the most common form of junction control. Traditionally, these junctions have been controlled by 'Yield' signs and road markings, with the traffic on the minor road giving way to the traffic on the major road.

advice

However, new junctions onto national roads shall be designed with 'Stop' signs and road markings in place of the 'Yield' signs.

mandatory

2.2 At new junctions onto regional and local

Departures (contd.)

- **What is <u>not</u> a Departure?**
  - Suggestions/Recommendations within NRA DMRB
  - Anything contained within Advice Notes – adopted as 'best practice' advice or as background information only
  - Relaxations – these need to be recorded in the Departures Report, but a formal application does not need to be completed

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Departures (contd.) Submission timeframes

- Prelim/Specimen Design
  - Prior to incorporation into the design and prior to statutory procedures
- Tender Stage
  - Should be submitted to NRA electronically on or before the date specified in ITT
- Construction Stage/Detailed Design
  - ASAP – 3 weeks are required to assess

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Departures (contd.) Submission timeframes

- Preliminary Design Departures are to be submitted prior to CPO
- Retrospective Departures will <u>not</u> be Approved
- Don't let this be you!

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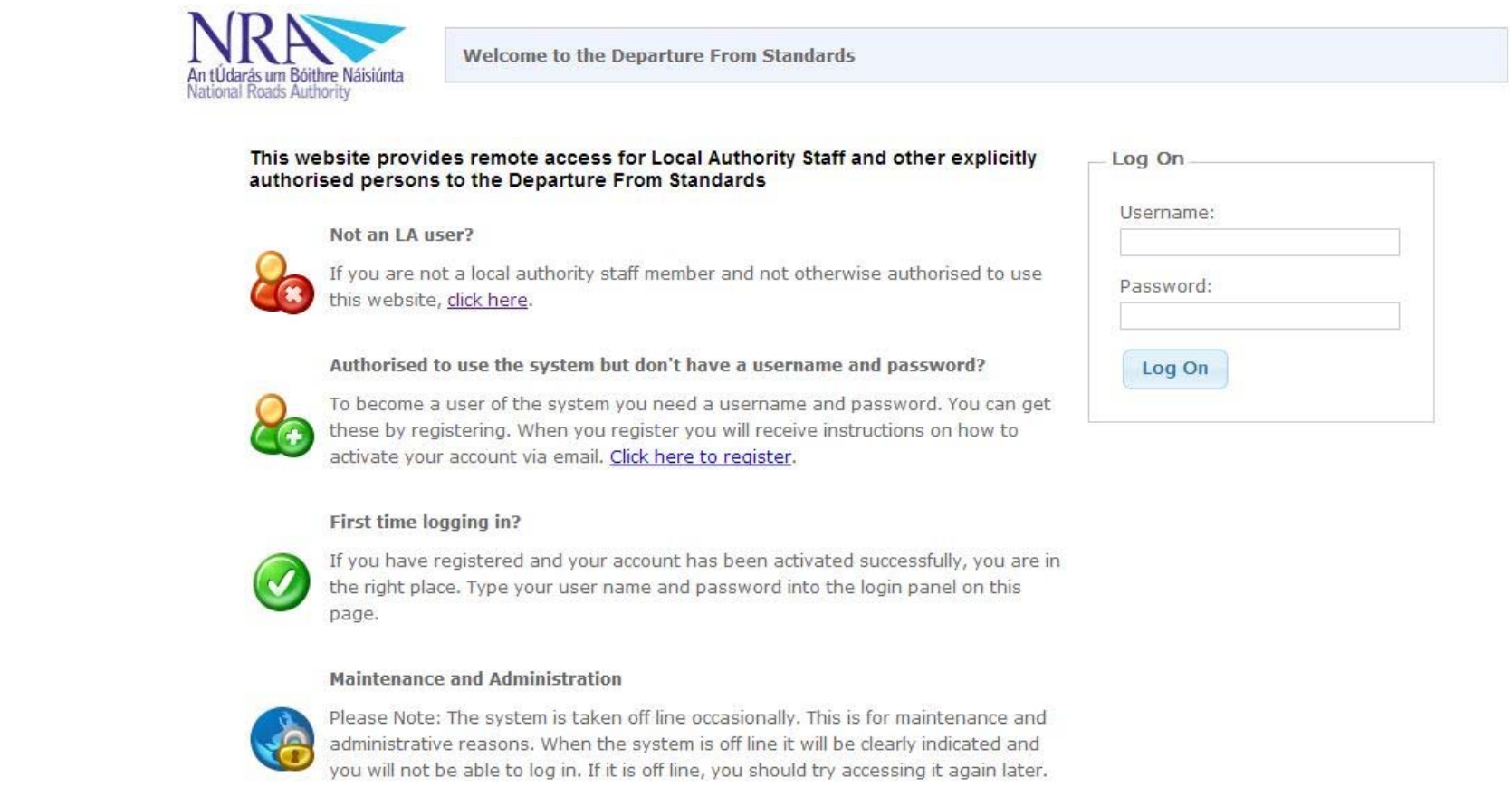
Departures (contd.)
Submitting a Departure

- All Departures are to digitally inputted on the NRA Web-based Departures Database

https://web.nra.ie/departures/

Departures (contd.)
Submitting a Departure



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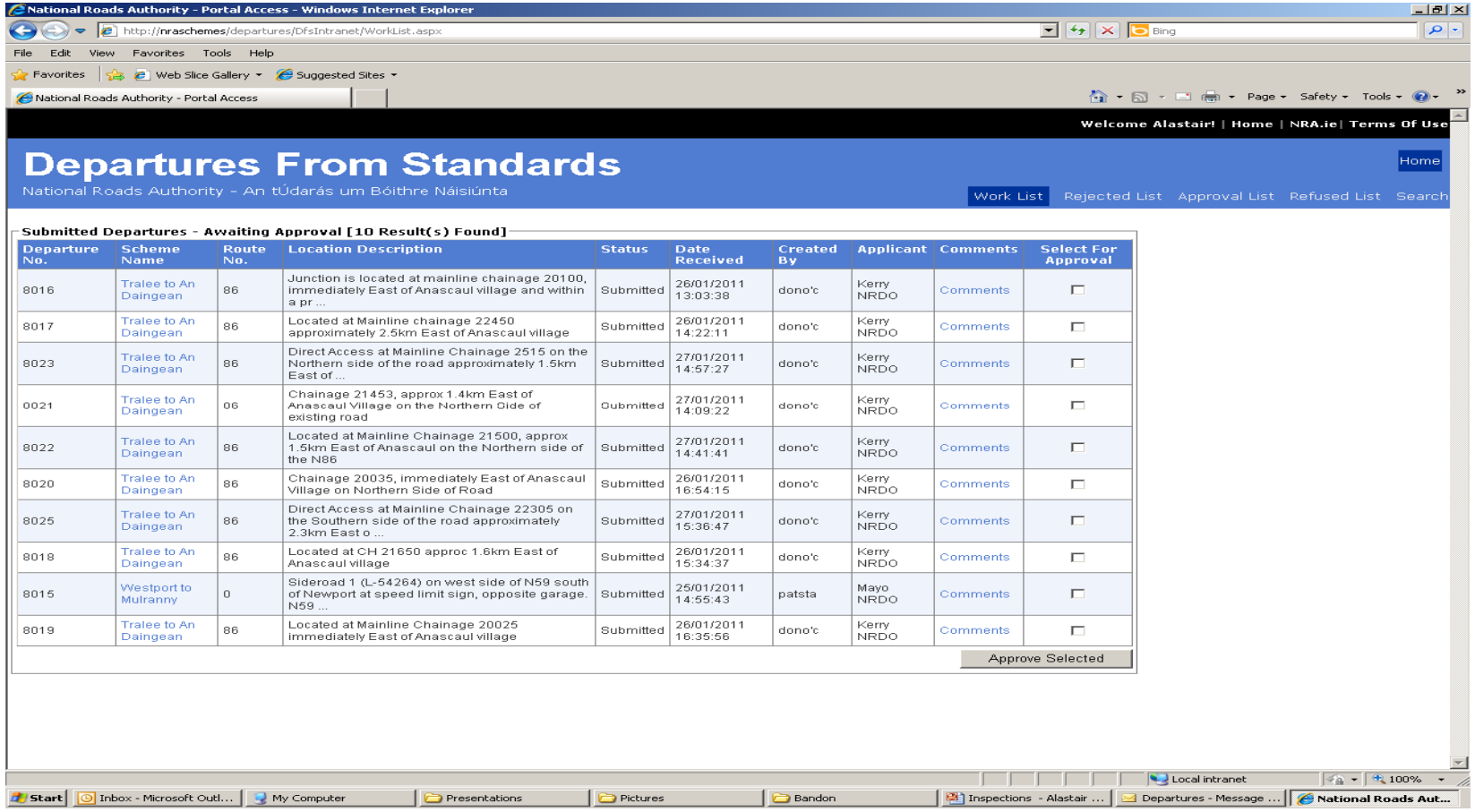
Departures (contd.)
Submitting a Departure



Departure No.	Scheme Name	Route No.	Location Description	Status	Date Received	Created By	Applicant	Comments	Select For Approval
8016	Tralee to An Daingean	86	Junction is located at mainline chainage 20100, immediately East of Anascaul village and within a pr ...	Submitted	26/01/2011 13:03:38	dono'c	Kerry NRDO	Comments	☐
8017	Tralee to An Daingean	86	Located at Mainline chainage 22450 approximately 2.5km East of Anascaul village	Submitted	26/01/2011 14:22:11	dono'c	Kerry NRDO	Comments	☐
8023	Tralee to An Daingean	86	Direct Access at Mainline Chainage 2515 on the Northern side of the road approximately 1.5km East of ...	Submitted	27/01/2011 14:57:27	dono'c	Kerry NRDO	Comments	☐
0021	Tralee to An Daingean	06	Chainage 21453, approx 1.4km East of Anascaul Village on the Northern Side of existing road	Submitted	27/01/2011 14:09:22	dono'c	Kerry NRDO	Comments	☐
8022	Tralee to An Daingean	86	Located at Mainline Chainage 21500, approx 1.5km East of Anascaul on the Northern side of the N86	Submitted	27/01/2011 14:41:41	dono'c	Kerry NRDO	Comments	☐
8020	Tralee to An Daingean	86	Chainage 20035, immediately East of Anascaul Village on Northern Side of Road	Submitted	26/01/2011 16:54:15	dono'c	Kerry NRDO	Comments	☐
8025	Tralee to An Daingean	86	Direct Access at Mainline Chainage 22305 on the Southern side of the road approximately 2.3km East o ...	Submitted	27/01/2011 15:36:47	dono'c	Kerry NRDO	Comments	☐
8018	Tralee to An Daingean	86	Located at CH 21650 approc 1.6km East of Anascaul village	Submitted	26/01/2011 15:34:37	dono'c	Kerry NRDO	Comments	☐
8015	Westport to Mulranny	0	Sideroad 1 (L-54264) on west side of N59 south of Newport at speed limit sign, opposite garage. N59 ...	Submitted	25/01/2011 14:55:43	patsta	Mayo NRDO	Comments	☐
8019	Tralee to An Daingean	86	Located at Mainline Chainage 20025 immediately East of Anascaul village	Submitted	26/01/2011 16:35:56	dono'c	Kerry NRDO	Comments	☐

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Departures (contd.)
Submitting a Departure

- Short description
- Departure Application Form
- Detailed drawing for each Departure showing plan and long section
- Drawing(s) of the entire scheme
- Contact details for the Employer's Representative

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Departures (contd.)
Submitting a Departure

APPENDIX B – APPLICATION FOR A DEPARTURE FROM THE NRA DESIGN MANUAL FOR ROADS AND BRIDGES DURING THE TENDER STAGE ONLY

General Information:		
Route:	Scheme:	Contract Type: (e.g. PPP /D&B/ Traditional)
Design Speed	Traffic Flow and Composition (if applicable):	
Carriageway Type/Cross Section		

Applicant Information:	
Applicant Name:	Contact Person and Contact Details:
Applicants Departure Reference No.	

Departure Information:
Departure Location and Chainage:
Departure Category *(e.g. Road Design, Structures etc.)*
Departure Type *(e.g. Horizontal Geometry, Vertical Geometry, Cross Section, etc.)*
Standard Required by NRA DMRB
Standard Provided
Departure Justification
Other Departures or Relaxations at same location

NRA DMRB References:	
NRA DMRB/MCDRW Reference (e.g. TD 9/05 etc):	NRA DMRB Paragraph/Table/Figure:
Additional Information and Supporting Documentation List:	

RECOMMENDATION AND APPROVAL (FOR NRA USE ONLY)	
Recommendation on Application	
Signature:	Date:
National Roads Authority Approval	
Signature:	Date:
Head of Engineering	
NRA Reference Number:	

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Departures (contd.)
Decision Process

- 3 Decision Options
  - Approve
  - Refuse
  - Reject

Departures (contd.)
Decision Process - Approve

"An approved Departure shall be considered as meeting the NRA's requirements for that element of the works, provided that any mitigation measures proposed by the designer or conditional to that approval are also incorporated into the design and works"

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Departures (contd.)
Decision Process - Refuse

"Where the decision of the NRA is that the Departure proposed is unacceptable"

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Departures (contd.)
Decision Process – Reject

"Where insufficient, inappropriate or contradictory information has been submitted as part of the Departure Application. Further information may be required and it is not possible to form a conclusive decision to Approve or Refuse the application"

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Departures (contd.)

Note:

- a) The approval of an application in no way precludes the NRA from requesting that certain safety measures be carried out at a future date in relation to the approvals given.
- b) The approval of a Departure, with or without comments, does not imply that the NRA relieves the designer of any responsibility for the design;

Departures (contd.)

- c) Departures are approved on a location-specific basis and relate to the particular circumstances identified in each submission. A similar Departure approval may be quoted to support a new application, but each case will be considered on its own merits;
- d) The NRA may allow "bulk" Departures (when the same non-standard method or material is proposed for use at more than one location) in certain, clearly defined circumstances.

Departures (contd.)

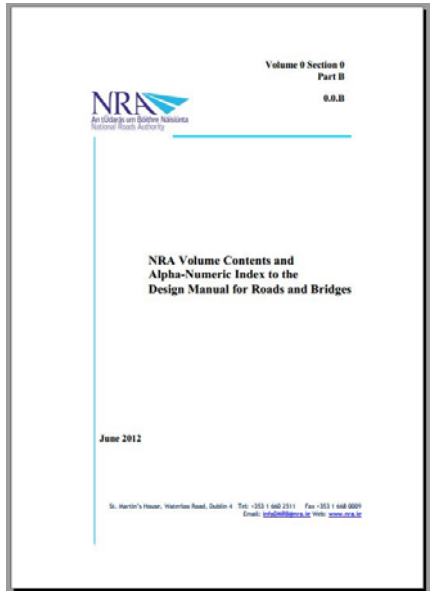
- When in doubt, give us a shout!

Phone: 045 988 900

email: infodeps@nra.ie

Design Standards

- Schemes shall be designed in accordance with NRA DMRB



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Design Standards – Alteration to Horizontal Alignment

- Alterations to Horizontal Alignment shall be consistent with the existing road network for 2km either side of the proposed scheme
- Consider future proposal for the section of road you are dealing with

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Design Standards – Alteration to Horizontal Alignment (contd.)

- Consider the impact of any realignment on existing access and junctions
- Ensure appropriate measures are included to mitigate these impacts

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Design Standards – Alteration to Horizontal Alignment (contd.)

- Where adverse camber is present, then road should be designed to provide superelevation in accordance with NRA TD 9
- The minimum provided should be consistent with adjacent sections
- Applied superelevation should not affect drainage

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Design Standards – Calculation of Design Speed

- Design Speed related to road characteristics not to Mandatory Speed Limits
- Design Speed shall be consistent with anticipated vehicle speeds
- Calculated for section being improved and for 2km sections either side

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Design Standards - Vertical Alignment

- Satisfy Desirable Minimum of NRA TD 9
- If not possible to achieve Desirable Minimum then a Departure shall be recorded
- Ensure no hidden dips are introduced

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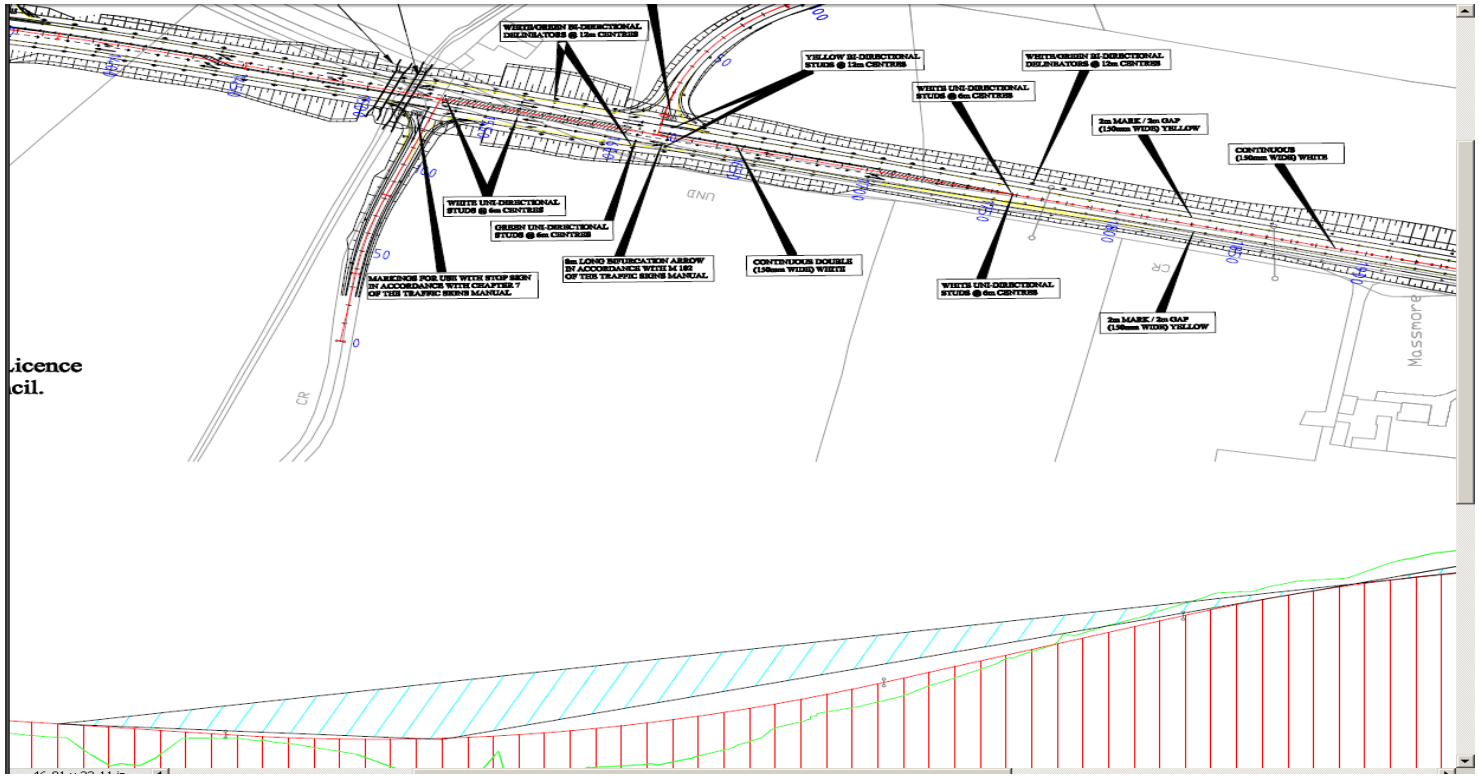
Design Standards - Vertical Alignment



Design Standards - Cross Section

- Designed to NRA TD 9
- Any reduction in cross-section shall be recorded as a Departure

Design Standards - Overtaking Value

- Minor Improvements to be consistent with adjoining sections
- Minimum overtaking should be achieved at a minimum as per Table 7/3, NRA TD 9
- Clearly identify Overtaking and Non-Overtaking sections

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Design Standards – Junction and Access Modifications

NRA TD 41-42 2009, Para 2.5

"There is a potential saving in collisions where there is a reduction in the number of lightly trafficked direct accesses and minor junctions made directly on to each national road"

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Design Standards – Junction and Access Modifications

What to do?

"Such accesses can be joined together with a link or service road before they join the main carriageway of the national road."

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Design Standards – Junction and Access Modifications

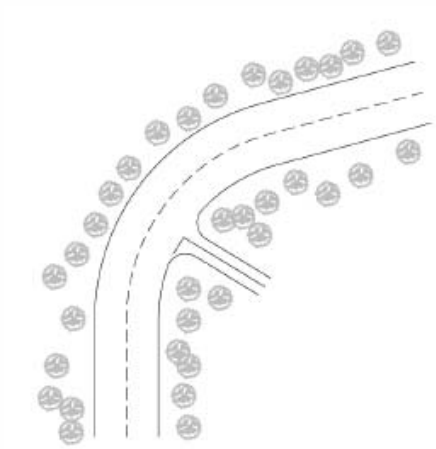


Figure 4/10 - Example 6 Existing Junction

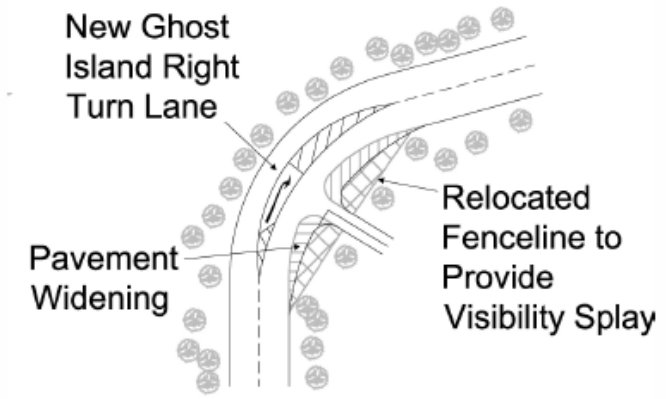
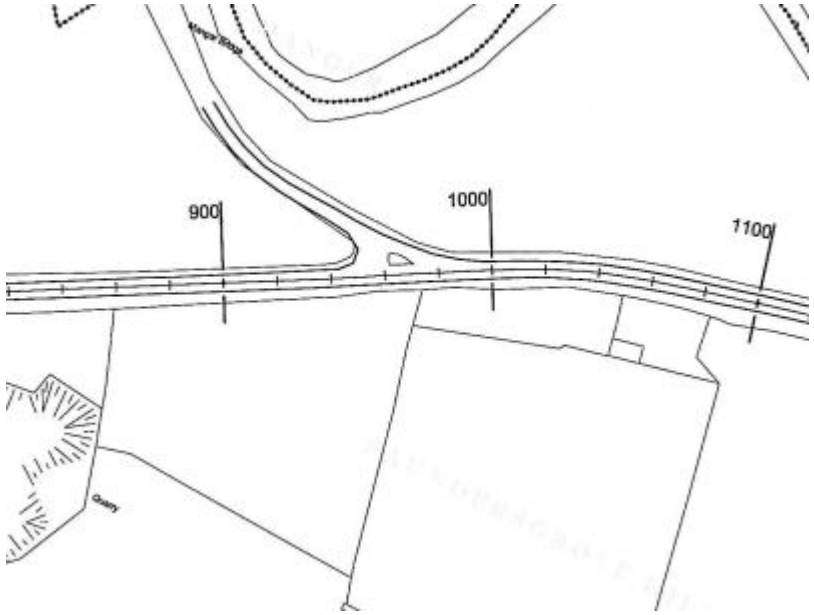
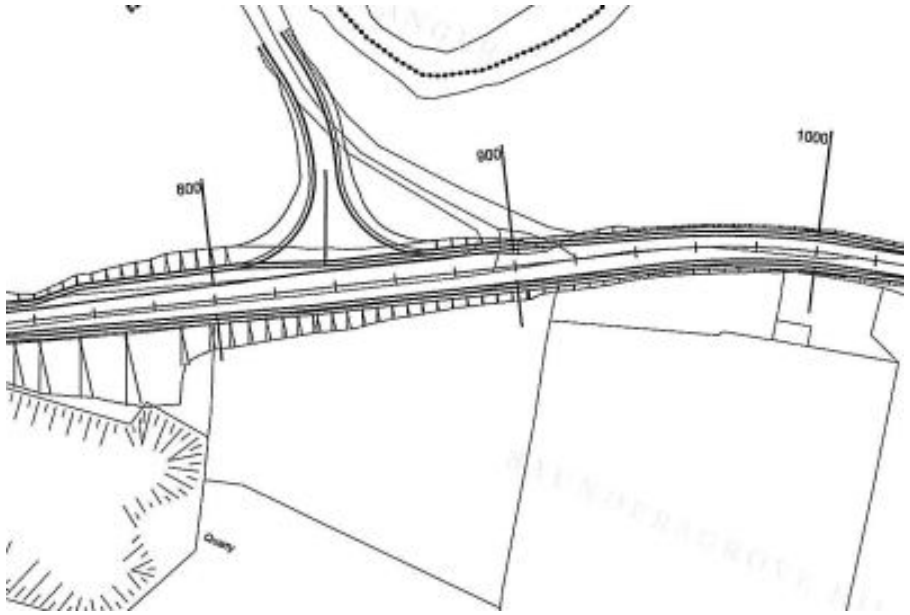


Figure 4/11 - Example 6 Improved Junction

Design Standards – Junction and Access Modifications



Before



After

Design Standards – Junction and Access Modifications

- Junctions and Accesses shall be assessed for compliance with NRA TD 9 and NRA TD 41-42
- Visibility shall not be adversely affected by minor improvements and should be improved

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Design Standards – Safety Barriers

- Designers shall consider hazard mitigation prior to application of NRA TD 19

  Removal - Relocation – Re-design – Revision – Reduction

  The risk assessment shall be undertaken at the prelim design stage

Road Safety Audits

- All schemes shall be subject to Road Safety Audits during design and at completion of construction

Departures from Standard

- May be necessary to retain existing features and design elements that do not meet the full requirements of the NRA DMRB
- These Relaxations and Departures shall be recorded in the Preliminary Design Report

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Departures from Standard

- The Preliminary Design Report shall form part of the Departure Application.
- The Preliminary Design Report shall be sent to the NRA Inspector
- The Preliminary Design Report shall be attached to the Departure Application.

Departure from Standard - Preliminary Design Report

- Application shall be made a minimum of 2 months prior to incorporation at the Final Design Stage
- Well in advance of finalisation of the landtake. This is to allow incorporation of any mitigation measures into the design that may have landtake implications

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Preliminary Design Report

- Preliminary Design Report may also be Refused if the report is deemed not to comply with NRA TA 85

Summary

- The Preliminary Design Report is your friend
- Route Consistency
- Submit Departures as soon as possible
- If in doubt, give us a call

Preliminary Design Report

What will be covered

- Objective of the Preliminary Design Report
- Contents of the Preliminary Design Report
- Worked Examples
- Approval Procedure
- Preliminary Design Report Drawings

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Preliminary Design Report

Objective

- Address and present issues relating to compliance with relevant parts of the NRA DMRB.
- Ensure that the standards to be applied are acceptable and all proposed RELAXATIONS & DEPARTURES are identified.
- The designer already has most of the information required for the preparation of a Preliminary Deign Report.

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Preliminary Design Report

Need for the Scheme

- Safety and Capacity Issues
- Existing pavement condition
- Existing horizontal and vertical alignment
- Existing road markings and signage
- Existing cross section
- Can be a Safety or Road Improvement Scheme

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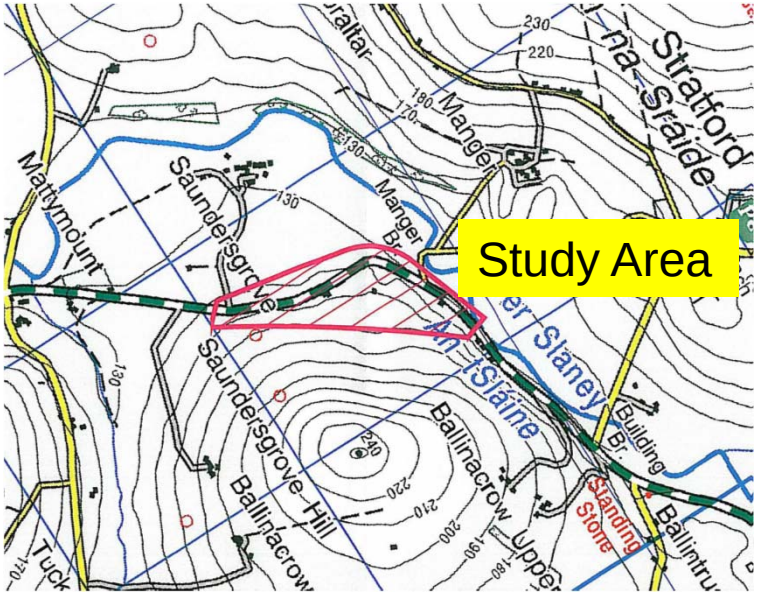
Need for the Scheme

Worked Example N81 Hangmans Bend



Need for the Scheme

Need for the Scheme

Analysis of the Existing Alignment

- Substandard horizontal and vertical alignment
- Substandard stopping sight distance
- Inadequate and incorrectly applied superelevation
- Poor overtaking sight distance
- Substandard visibility at the junction
- Several road side hazards along the proposed scheme
- The existing carriageway/surface is in poor condition with substandard road markings and signage

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Collision History

Available from the NRA Safety Section

- Can be obtained from infosafety@nra.ie
- Contains the collision history for a 5 year period for your study area
- Outlines the collision type and injuries sustained
- Allows the designer to examine the collision types to establish if there is a pattern

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Design Speed

Related to road characteristics and not the mandatory speed limit

Design Speed

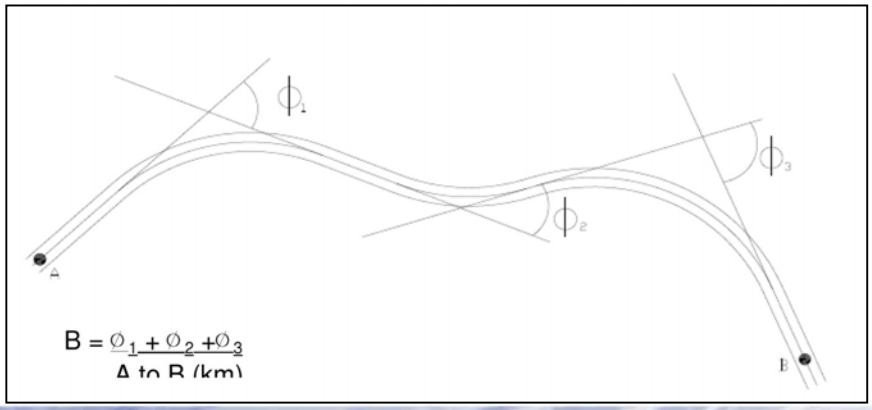
Main Factors Affecting Speed

- Alignment Constraints (Ac)
  - This measures the degree of constraint imparted by the road alignment
  - Dual Carriageways: Ac = 6.6 + B/10
  - Single Carriageways: Ac = 12 - VISI/60 + 2B/45
- Layout Constraints (Lc)
  - This measures the degree of constraint imparted by the road cross section, verge width and frequency of junctions and accesses.
  - Table 1/1 of NRA TD9 shows the values of Lc

Design Speed

Alignment Constraints (Ac)

- B = Bendiness (total angle the road turns through), degrees/km;
- VISI = Harmonic Mean Visibility, m (Annex A of NRA TD9)



Design Speed

Worked Example (Please Refer to Hand Out)

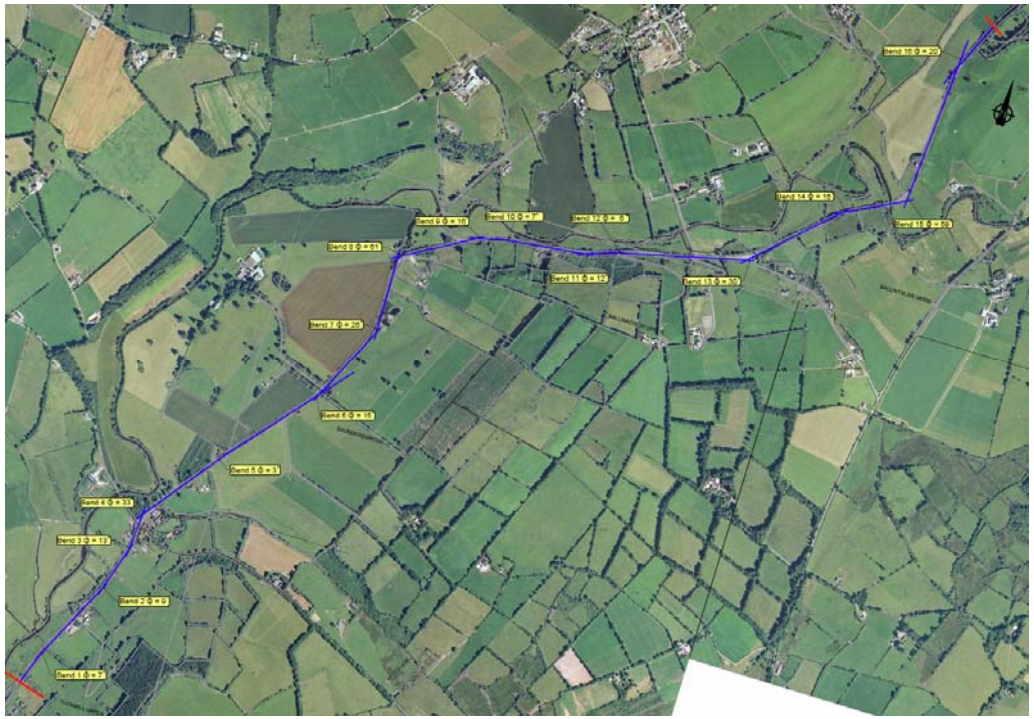
- For the purpose of this example the following properties for the existing carriageway were taken;
  - Existing carriageway 6.0m wide
  - Existing verge width of 1.5m average
  - No hard shoulders
  - 18 Domestic entrances
  - 6 Junctions
  - 4 Double field entrances
  - VISI 150 from Appendix A of NRA TD9

Design Speed

Worked Example (Please Refer to Hand Out)

- Alignment Constraint (Ac)
  - Single Carriageways: Ac = 12 - VISI/60 + 2B/45
  - B = Bendiness of existing alignment 2km either side of proposed improvements
  - Total bendiness over 5km = 333 therefore B = 66.6
  - Ac = 12 – 150/60 + 2X66.6/45
  - Ac = 12.46

Design Speed



Design Speed

Worked Example Layout Constraints
(Please Refer to Hand Out)

- Layout Constraint (Lc)
- Total of 28 Access over 5km
- When rounded up = 6 access/km
- From NRA TD9 that gives a Medium level of access
- From Table 1/1 Layout Constraints of NRA TD9 Lc of 28

Design Speed

Table 1/1 Layout Constraints of NRA TD9

Road Type	S2						D2AP		D3AP	D2M		D3M
Carriageway Width (ex. hard strips)	6m		7.0m		7.3m		Dual 7.0m		Dual 10.5m	Dual 7.0m	Dual 7.5m	Dual 10.5m or 11.25m
Degree of Access and Junctions	H	M	M	H	M	L	M	L	L	L	L	L
With hard shoulders					21	19	10	9	5	5	4	0
Without hard shoulders:												
With 3.0m Verge	(29)	(26)	25	23	(23)	(21)	(12)	(11)	(6)			
With 1.5m Verge	(31)	(28)		(27)								
With 0.5m Verge	(33)	(30)	For Type 2 and Type 3 Dual Carriageways see NRA TD10.									

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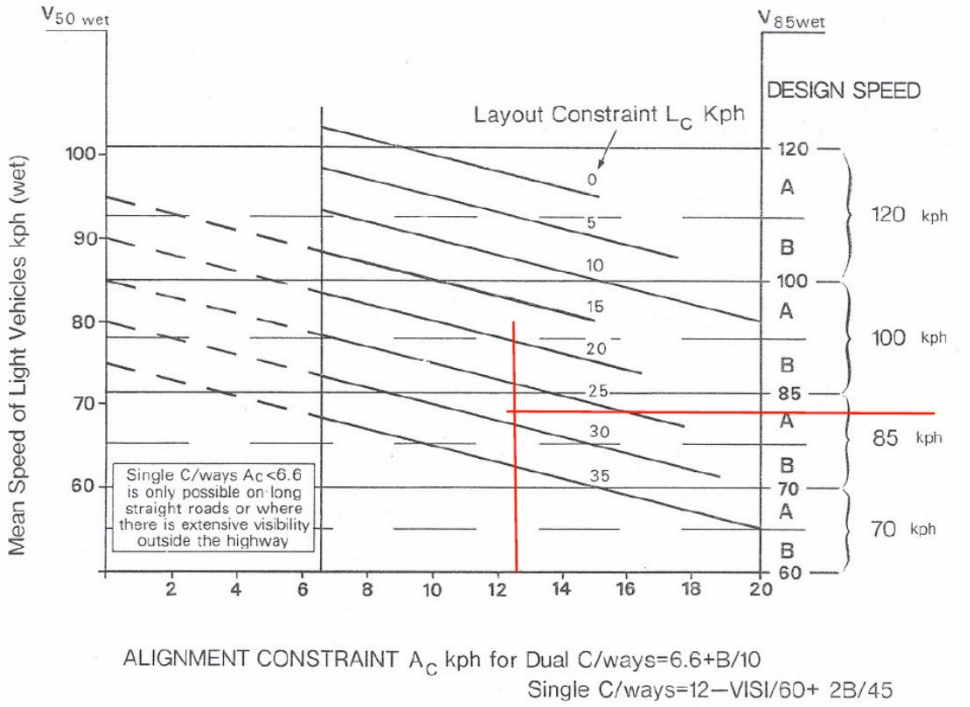
Design Speed

Using Figure 1/1: Selection of Design Speed from NRA TD9

Lc = 28
Ac = 12.46



Design Speed = 85km/h

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Options Considered

At least 3 Options should be considered

- Option 1 Do Nothing
  - Maintain the existing alignment and carriageway surface
- Option 2 Do Minimum
  - Overlay (no change to horizontal or vertical alignment) to include alterations to superelevation, cross fall or adverse camber
  - Upgrade of the existing road markings and signage
  - Junction modification
  - Drainage modification

Options Considered

- Option 3 Do Something
  - On line or off line redesign of the horizontal and vertical alignment.
  - Redesign of Junctions
  - Redesign of Drainage
  - Relocation of services
  - New safety barriers where required
  - New road markings and signage

- One of the above design elements or a combination of them may be included within the proposed scheme

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Constraints

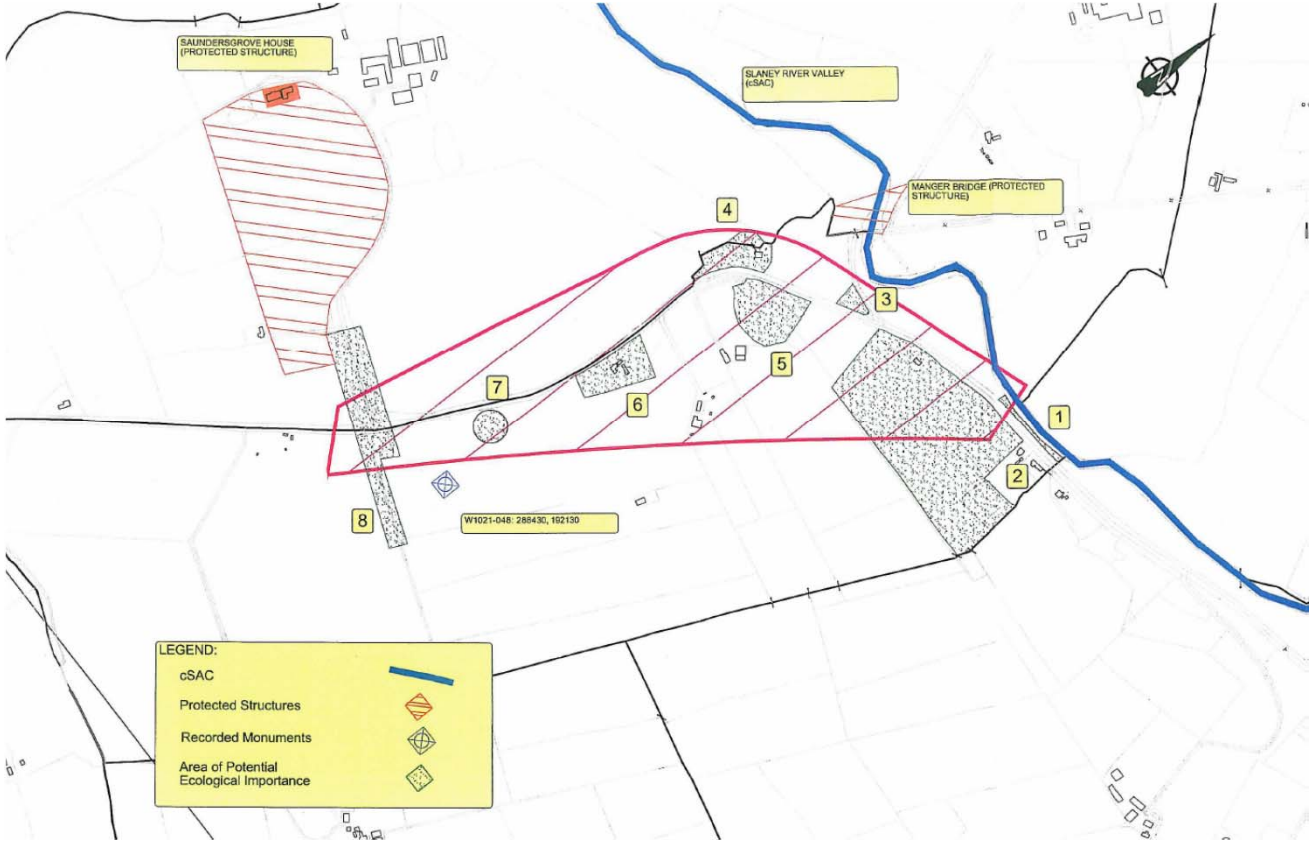
The following is a non exhaustive list

- Budgetary/Economic Constraints
- Existing topology within the study area
- Existing Road Layout and Access
- Land Ownership and Domestic properties
- Existing Utilities
  - ESB
  - Water main
  - Eircom
  - Gas
  - Foul Sewer

Constraints

- Drainage outfalls
- Archaeology
- Ecology
- Architectural Heritage
- Temporary Traffic Management during Construction

Constraints



Constraints drawing for N81 Hangman's Bend

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Geometric Features

A detailed analysis of both the existing and proposed alignment should be undertaken and should include the following;

- Horizontal and Vertical Alignment
- Cross Section (Existing and Proposed)
- Cross Fall & Superelevation
- Stopping Sight Distance
- Full Over Taking Sight Distance

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Geometric Features
Selection of Cross Section

Should comply with NRA TD9 Table 6/1 Recommended Rural Road Layout

- May not always be economically feasible to provide a full cross section in accordance with NRA TD9 (Departure Required)
- Should consider the future road strategy
- Should consider the existing cross section on either side of the proposed works for route consistency
- Consideration should also be given to Non-Motorised Road Users

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Geometric Features

Worked Example N81 Hangmans Bend

- Design Speed 85kph
- Stopping sight distance desirable min = 160m
- Horizontal Radius desirable min = 510m
- Superelevation = 5% with desirable min radius
- Desirable min Crest K Value = 55
- Desirable min Sag K Value = 26
- Full Overtaking Sight Distance = 490
- Maximum Gradient for Single Carriageway = 5%

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Geometric Features

DESIGN SPEED (km/h)	120	100	85	70	60	50	V^2/R
STOPPING SIGHT DISTANCE m							
Desirable Minimum Stopping Sight Distance	295	215	160	120	90	70	
One Step below Desirable Minimum	215	160	120	90	70	50	
Two Steps below Desirable Minimum	160	120	90	70	50	50	
HORIZONTAL CURVATURE m							
Minimum R^+ without elimination of Adverse Camber and Transitions	2880	2040	1440	1020	720	510	5
Minimum R^+ with Superelevation of 2.5%	2040	1440	1020	720	510	360	7.07
Minimum R with Superelevation of 3.5%	1440	1020	720	510	360	255*	10
Desirable Minimum R with Superelevation of 5%	1020	720	510	360**	255**	180*	14.14
One Step below Desirable Min R with Superelevation of 7%	720	510	360	255**	180**	127*	20
Two Steps below Desirable Min R with Superelevation of 7%	510	360	255	180**	127**	90*	28.28
Three Steps below Desirable Min R with Superelevation of 7%			180	127**	90**	65*	40
Four Steps below Desirable Min R with Superelevation of 7%			127	90**	65**	44*	56.56
VERTICAL CURVATURE – CREST							
Desirable Minimum Crest K Value	182	100	55	30	17	10	
One Step below Desirable Min Crest K Value	100	55	30	17	10	6.5	
Two Steps below Desirable Min Crest K Value	55	30	17	10	6.5	6.5	
VERTICAL CURVATURE – SAG							
Desirable Minimum Sag K Value	53	37	26	20	13	9	
One Step below Desirable Min Sag K Value	37	26	20	13	9	6.5	
Two Steps below Desirable Min Sag K Value	26	20	13	9	6.5	6.5	
*** Absolute Minimum Vertical Curve Length to be used on Dual Carriageways	240	200	-	-	-	-	
OVERTAKING SIGHT DISTANCES							
Full Overtaking Sight Distance FOSD m.	N/A	580	490	410	345	290	
FOSD Overtaking Crest K Value	N/A	400	285	200	142	100	

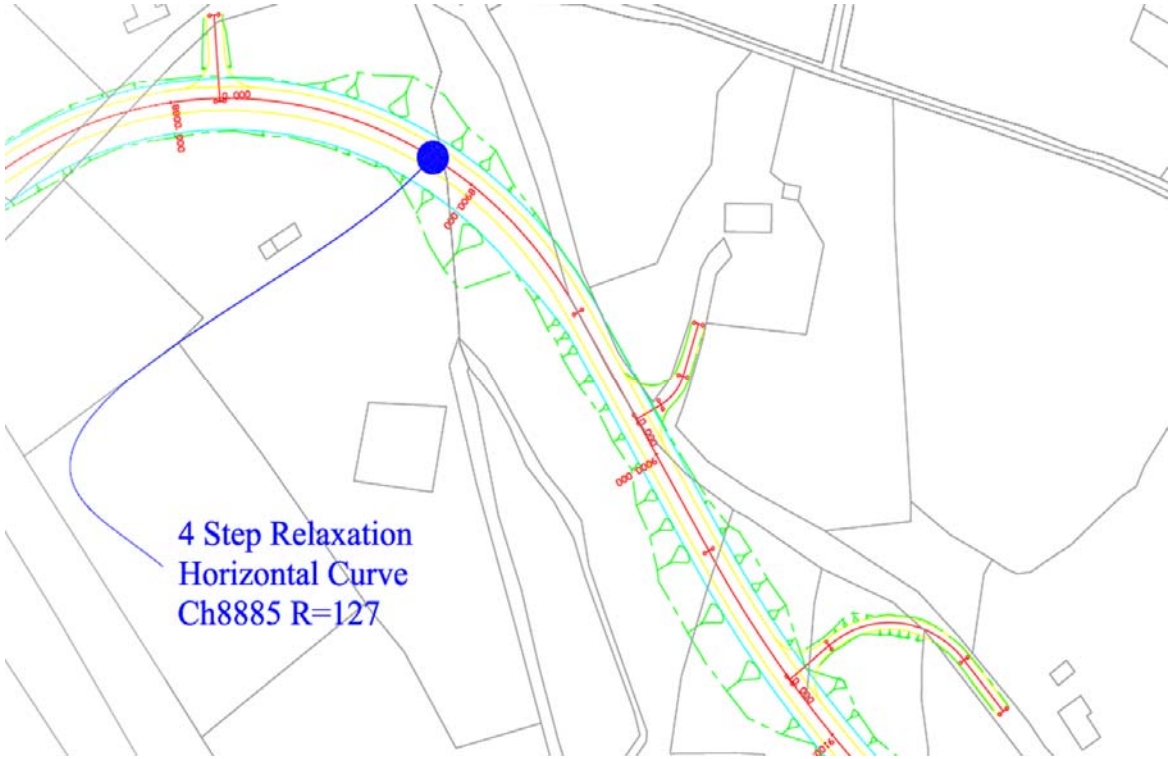
Table 1/3 Design Speed Related Parameters from NRA TD9

Horizontal Design

- Is removing a bend now creating an unsafer road?
- Example
  - A new long straight into a bend below standard, where before there were consecutive bends that reduced the speed into the bad bend?

Horizontal Design

Example



Superelevation

- Always try to remove adverse camber, but does not always have to be 7%.
- Consistent with design speed entering bend
- Consistent with other bends on road
- Drainage effect
- Practicality care- with accesses and or junctions

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Superelevation

Example

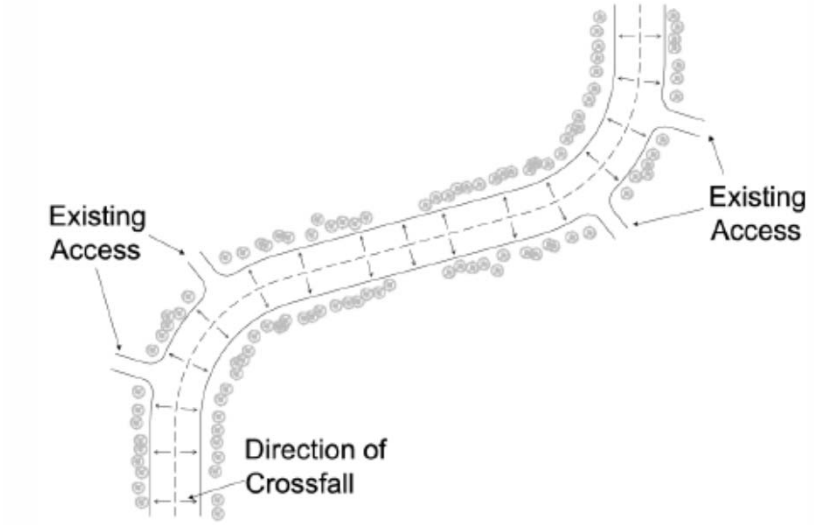

Figure 4/8 - Example 5 Adverse Camber

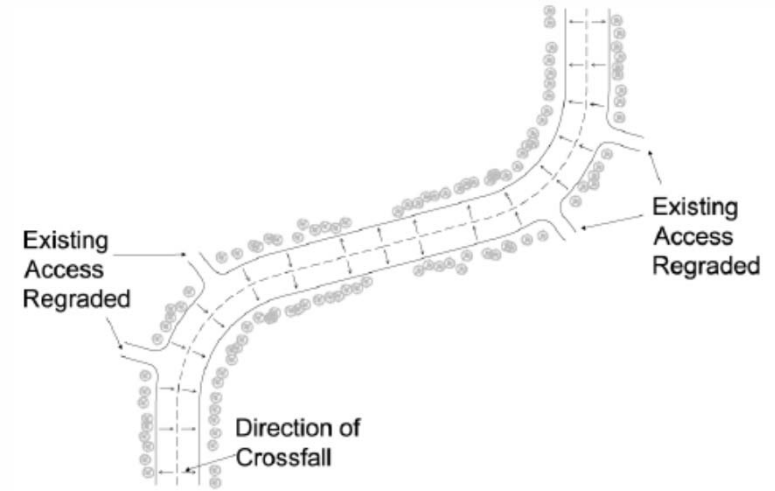

Figure 4/9 - Example 5 Superelevation

Vertical Design

Section 4 of NRA TD9

- Beware of creating hidden dips that were not there before
- This can happen when removing bends in the road
- FOSD must be provided in both the Horizontal and Vertical in each direction of travel

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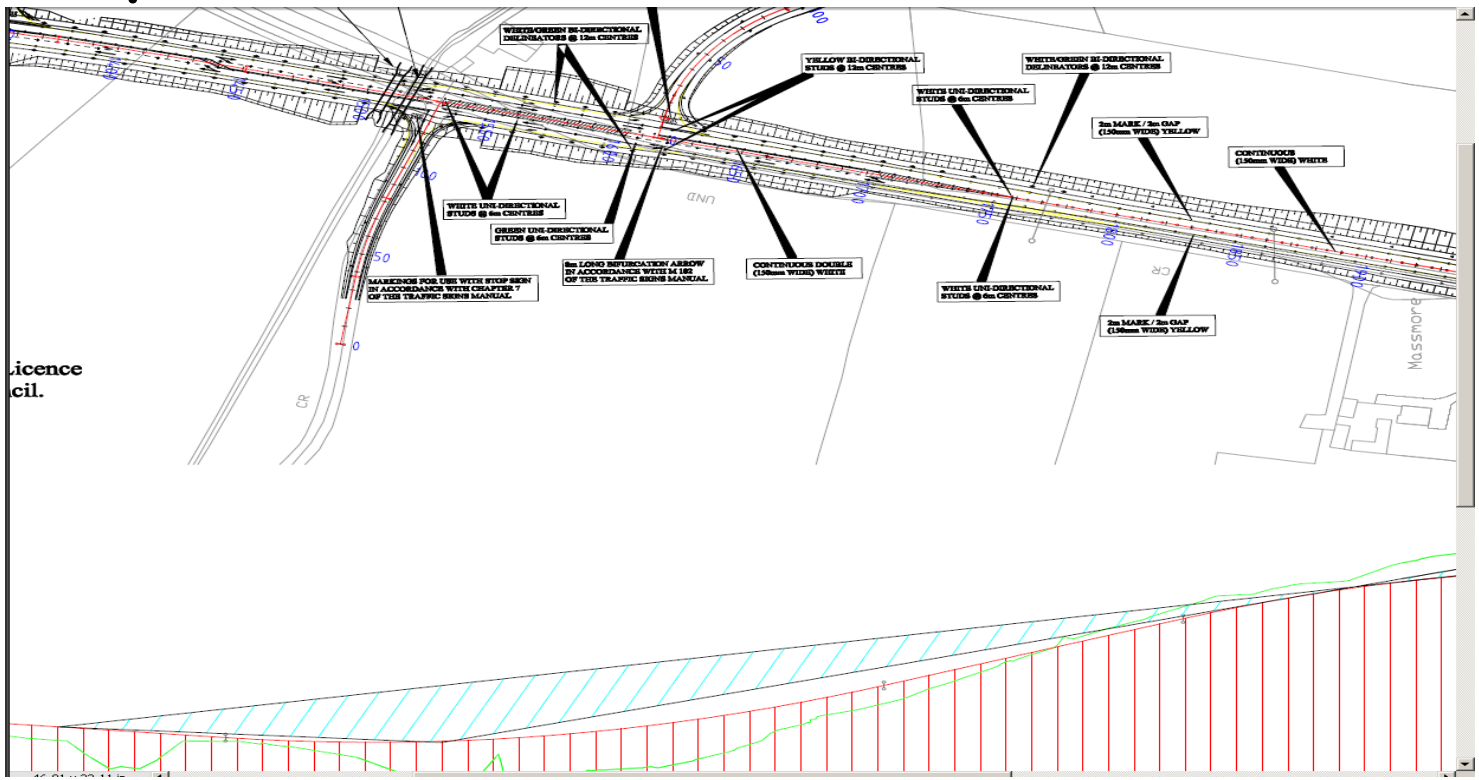
Vertical Design

Example



Safety Barriers

The following hazard mitigation measures should be examined prior to applying the principles of NRA TD 19

- Removal of the hazard
- Relocation of the hazard
- Re-design of the hazard to reduce the danger to road users
- Revise the road layout or cross-section to lower the risk
- Reduce impact severity

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Safety Barriers

- To assess the need for a safety barrier on a Scheme involving online realignment, the risk assessment procedure outlined in Chapter 8 of NRA TD 19 shall be followed

- Where a Scheme involves a section of offline realignment the designer should follow the risk assessment procedure in NRA TD 19, but should consider that the collision risk rating may be reduced by the improvement to the alignment

Drainage Requirements

- Shall ensure that surface and sub-surface drainage provisions in accordance with HD 33, as amended by the NRA, are included in the design

- Where existing road drainage provisions are to be incorporated an assessment of the adequacy of the drainage system shall be made and should include a review of the superelevation and longitudinal gradient

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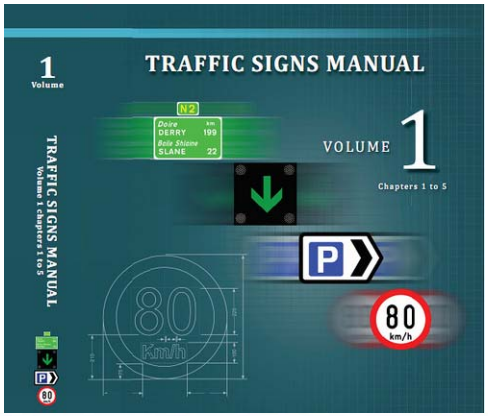
Traffic Signs, Road Markings and Reflectors

The Design Organisation shall ensure that improvements to existing signs, road markings and reflectors shall comply with the requirements of the Traffic Signs Manual where possible



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Non Motorised Road Users

This should be considered in conjunction with the selection of the proposed Cross Section and should include the following

- An assessment of existing footways/cycle tracks in the vicinity of the minor improvement
- And where footways/cycle tracks are required, the verge shall be widened accordingly to accommodate these features
- It should be investigated if the relevant Local Authority intends to provide footways/cycle tracks along the route in future

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Junctions and Access Modifications

- Minor improvements involving upgrades to existing junctions shall comply with the requirements of NRA TD 9 and NRA TD 41-42 where possible

- Forward visibility and visibility splays at junctions and accesses, which are currently below NRA DMRB standards, shall not be adversely affected and where possible should be improved

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Junctions and Access Modifications

Example

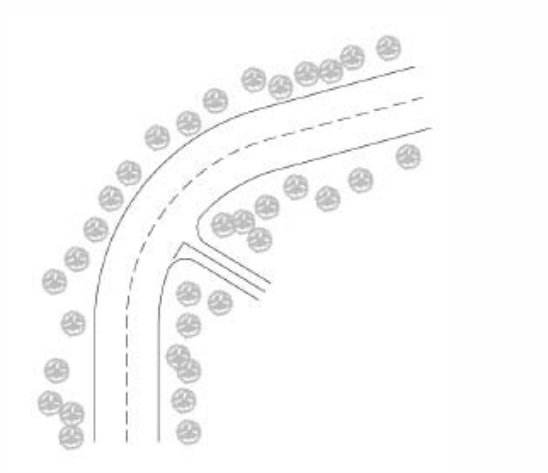

Figure 4/10 - Example 6 Existing Junction

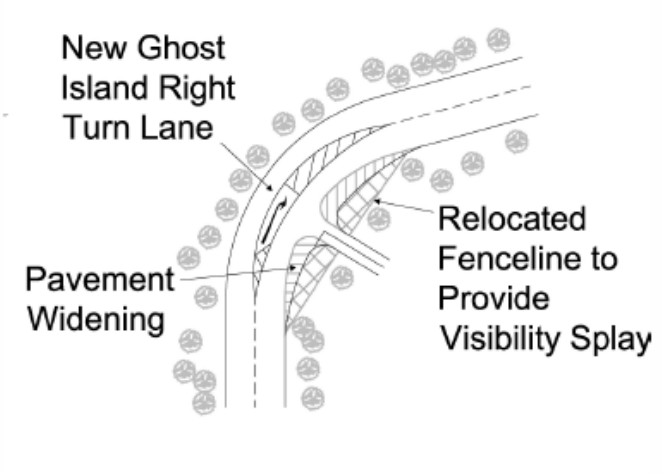

Figure 4/11 - Example 6 Improved Junction

Junction Redesign

Junctions and Access Modifications

Example

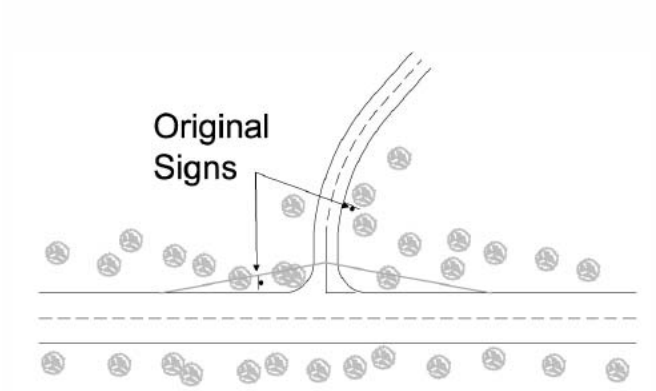

Figure 4/14 - Example 8 Inadequate Visibility

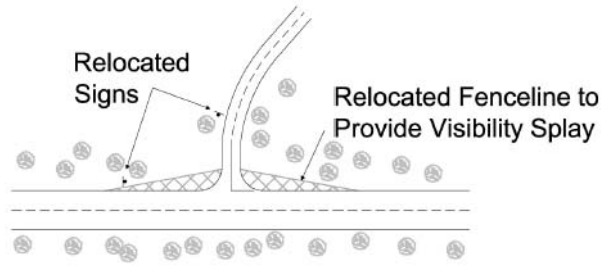

Figure 4/15 - Example 8 Visibility Provided

Sign Relocation and Site Clearance

Departure and Relaxation Approval Procedure

- All Relaxations and Departures from Standard shall be recorded in the Preliminary Design Report
- All proposed Relaxations and Departures for each schemes shall be identified and logged as one Departure application
- This single Departure shall be submitted to the NRA through the NRA Departures Database for approval

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Departure and Relaxation Approval Procedure

- The Preliminary Design Report shall form part of the Departure application and shall be submitted as an attachment to the Departure application

- All relevant documents shall be submitted a minimum of **two months** prior to incorporation into the final design, and well **in advance** of the finalisation of the landtake line for Statutory Planning Procedures or Tender Stage

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Departure and Relaxation Approval Procedure

- The Design Organisation shall ensure that the proposed minor improvement does not result in the introduction of new Departures on the adjacent sections of existing road

- All Departures relating to the NRA Manual of Contract Documents for Road Works shall be submitted separately to the NRA for approval as appropriate

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Road Safety Audit

- All schemes shall be subject to Road Safety Audits;
  - During Design
  - Completion of Construction

- Road Safety Audits should be carried out in accordance with NRA HD 19.

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Preliminary Design Drawings

- All drawings should be to scale of at least 1:2500 horizontally
- Both plan and profile for each Option considered should be shown
- All departures applied for should be clearly marked and referenced on the preliminary design drawings

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Summary

- Section 2 of NRA TA85/13 Preliminary Design Report
- Section 3 of NRA TA85/13 Design Standards
- Section 4 of TA85/13 Worked Examples
- Appendix A NRA TA85/13 Preliminary Design Report and Checklist Example
- Appendix B Application for Departure from the NRA DMRB

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TA85/13

THANK YOU

ANY QUESTIONS??

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National Roads Authority – Standards Section
Training for New Developments
April 2013

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