

NRA Standards and Specifications – Shaping the Future of National Roads

Annual NRA National Roads Conference 2013 – Day 2, Thursday 10 October 2013

Introduction

- Gavin O'Donnell
 - Associate Director, Arup & NRA Standards Co-ordinator

- *“There can be little doubt that in many ways the story of bridge building is the story of civilisation. By it we can readily measure an important part of a people’s progress”*

Franklin D Roosevelt

The Past

- Big Steps in Road Building
 - 3,000 BC - Mesopotamia – First Road Links (3,000 BC)
 - Appian Way – Start of First Major Road Network (300 BC)
 - Europe – National Routes Emerging (17th Century)
 - German AutoBahn – 1st Section between Cologne and Bonn (1932)
 - c. 60,000km of US Interstate Highway (between 1950s & 1980s)

The Present

- Where are we now?
 - USA – 6,506,204km of total road network
 - China – building c. 2,000km per year
 - Ireland – c. 100,000km of total road network

Data obtained from ChartsBin.com

The Future

- ??? - Later.....

Outline of Presentation

Agenda

- **Overview of NRA Standards**
- Significant Recent Developments
- Significant Future Developments
- Closing Comments

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Overview of NRA Standards

Objectives of NRA Standards

“...promote quality and consistency of approach in relation to the design and construction of road and bridge projects;

...to achieve an appropriate balance of economy, safety, sustainability and durability on road schemes”

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Drivers for Change

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- **Sustainability**
- Developments in international standards
- Technical developments (materials, products, systems)
- Feedback from National Roads Projects
- Conclusions of research projects
- Developments with NRA policies
- Compliance with the EU regulations (e.g. CPR 2011)
- Representation from industry

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Legislative and Regulatory Change

- EU and National Legislation
 - Road Infrastructure Safety Management (RISM)
 - Occupational Health and Safety
 - Environmental Regulations
 - Construction Products Regulations (CPR)
 - ...etc
- European and National Standards
 - The Structural Eurocodes
 - Harmonised ENs
 - Other ENs
 - National Standards Development



Monitoring Developments

- **HA Website**
 - UK DMRB and MCHW Developments
- **EU Tris Website**
 - Draft European Technical Standards & Regulations
- **CEN Technical Committees**
 - Draft Developments in ENs for Road Features
- **Your Standards Your Say – NSAI Website**
 - Developing Irish National Standards
- **Other International Sources**
 - AASHTO, Austroads, etc..

<http://www.dft.gov.uk/ha/standards/dmrb/index.htm>

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<http://ec.europa.eu/enterprise/tris>

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<http://www.cen.eu/cen/Sectors/TechnicalCommittees/Workshops/CENTechnicalCommittees>

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Various sites

Features



- Standards Home
- About Us
- Standards Documents
- NRA DMRB Documents**
- NRA MCDRW Documents**
- Interim Advice Notes
- Recent Changes
- Subscribe for Alerts**
- Apply for Departure**
- Technical Bulletins**
- Related Material**
- Forward Look**

You Are Here : > Home

NRA Standards

NRA Design and Contract Document Manuals

Welcome to the National Roads Authority Standards website.

Follow the links on the left hand side to access the various parts of the website.

The NRA Design and Contract Document Manuals contain information relating to the design, construction and maintenance of national roads schemes in Ireland and can also be accessed below:

[The NRA Design Manual for Roads and Bridges \(NRA DMRB\)](#)

[The NRA Manual of Contract Documents for Roadworks \(NRA MCDRW\)](#)

[NRA Interim Advice Notes](#)

For Standards or specification related queries, please contact:

infoDMRB@nra.ie

For Departures please contact:

infoDEPS@nra.ie

- Technical Bulletins
- Related Documents
- Presentations
- Forward Look

Control of Standards

- Main Features
 - Only controlled version of the NRA DMRB/MCDRW
 - Updates made directly to Standards Website **& subscribers alerted**
 - Previous versions of all documentation available
 - Search tool – very handy!



[NRA Standards](#) ▶ [NRA DMRB](#) ▶ [Volume 6: Road Geometry](#)

You have downloaded this file 5 times in the last 24 hours, limit is 0.
Your file downloads total 529 in the last 24 hours, limit is 0.

NRA TD 9 - Road Link Design (incorporating TA 43, where applicable)



Download Current Version

DMRB Part	6.1.1
UK DMRB Reference Document:	N/A
NRA Addendum or Standard Dated	Feb 2012
Download Earlier Versions:	2000 (Incl TA 43) 2001 (Incl TA43) 2003 (Incl TA 43) 2004 2005 April 2007 Dec 2010 Nov 2011

Control of Departures

- Main Features

- Developed by NRA IT section
- All users must register
- Allows for efficient communication and control
- Allows for remote access to address issues

Departure From Standards

National Roads Authority - An tÚdarás um Bóithre Náisiúnta

Home

New WorkList Recent Search

Welcome to the Departures From Standards Application System



This is a web-based applications for departures from standards system which will ensure ease of access at all times. Each user of the DFS has been assigned their own personalised username and password. These should not be used by anybody other than the person they have been assigned to. Should another person within your organisation wish to have access to the system they must register and then contact the NRA and access rights will be organised for them.

When submitting an application, files containing accompanying documentation may be attached. The size of these files is limited to approximately 3 megabytes in size. Files larger than this may be rejected and will not be attached to the submission.

Further information related to NRA standards and departures from them may be found on the [NRA Standards web site](#).

If you have any queries regarding this system please see the contact list below.

NRA Contacts

Alastair De Beer

Project Manager - Engineering Standards

adebeer@nra.ie

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01 6602511 Extn. 295

Forward Look

- Highlights the developments close to publication

Forward Look (Dated July 2013)

SUBJECT TO CHANGE WITHOUT NOTIFICATION

Area of Work	Document Considered	Significance of Change	Possible Publication Date (Estimate Only)
Traffic Signs & Lines	NRA MCDRW Series 1200 Traffic Signs and Road Markings (potentially all volumes)	Major update addressing a wide range of technical requirements	Quarter 4 2013
Traffic Controls & Communications	NRA DMRB Volume 9 Network – Traffic Control And Communications	Issue of a new advice note covering Infrastructure Design for Motorway Communications and an NRA standard covering Loop Detectors for Motorways.	Quarter 4 2013
Pedestrian / Cycling Facilities	NRA DMRB Volume 6 Road Geometry	Issue of a new standard covering a Rural Cycle Scheme Design	Quarter 4 2013
Structures	NRA DMRB Volume 3 Highway Structures: Inspection and Maintenance	Major update (all documents potentially affected)	Quarter 4 2013
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	NRA MCDRW Series 2400 Brickwork, Blockwork and Stonework (potentially all volumes)	Minor changes, plus inclusion of NRA Masonry Specification	Quarter 4 2013
Pavement	NRA DMRB Volume 7 Pavement Design and Maintenance	Issue of a new standard covering a System for Permanent Repair Materials	Quarter 4 2013
	NRA MCDRW Series 900 Road Pavements - Bituminous Bound Materials (potentially all volumes)	Moderate update addressing requirements for a range of specific areas, such as surface dressing, recycled asphalt, binder, permanent repair materials, etc..	Quarter 4 2013

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	NRA MCDRW Series 800 Road Pavements - Bituminous Bound Materials (potentially all volumes)	Moderate update addressing requirements for a range of specific areas, such as surface dressing, recycled asphalt, binder, permanent repair materials, etc..	Quarter 4 2013

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- Indicates the nature of the changes
- Gives a broad estimate of the timing of update

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- TQ raised if technical response required
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March 2013 Publication

- **NRA DMRB:**

- As-Built Records (NRA GD 101) - New
- Online Services Areas (NRA TA 70) - Update
- Introduction (NRA GD 1) and Departures (NRA GD 100) - Update
- NRA TA 85, NRA TD 19 and NRA BD 52

- **NRA MCDRW:**

- Introduction (NG Series 000)
- Preliminaries (NG Series 100 – Table NG 1/1)
- Series 400, 600, 800, 1000 and 2200

- **Technical Bulletins:**

- Five Technical Bulletins (NRA TB 1 to 5)



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June / July 2013 Publication



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- Introduction to the NRA DMRB
- Online Services Areas (NRA TA 70) – Minor Change
- Errata to NRA GD 100, NRA TD 19 and NRA TA 85

- **NRA MCDRW:**

- Introduction to the NRA MCDRW (NRA SD 01)
- Series 000, Errata to Series 600 & Series 800

- **NRA Interim Advice Notes:**

- Microsurfacing, Surface Dressing & Bond Coat Spec (NRA IAN 04/13)
- Update to HD 36 Surfacing Materials for New and Maintenance Construction (NRA IAN 05/13)

- **Technical Bulletins:**

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- Wording in Section 1.24 below
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1.24 From 19th December 2013, the NRA will require all those signing-off designs for national road schemes, under the NRA DMRB, to be recognised as professional engineers under Directive 2005/36/EC of the European Parliament and of the council on the recognition of professional qualifications. The title of Chartered Engineer (CEng) is the relevant professional title in Ireland.

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- Wording the same in each – Section 1.26 and 1.27 below
- Also see NRA TB 5 for further NRA Standards information

Construction Products Regulations

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- **Same wording in each – Section 1.26 & 1.27 of NRA GD 1**
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Construction Products

1.26 In compliance with the Construction Products Regulation (EU) No 395/2011 (CPR), as from 1 July 2013, all construction products covered by a harmonized European product standard (hEN) must have a Declaration of Performance (DoP) and a CE mark in order for them to be placed on an EU market. From 1 July 2013, all parties working on NRA funded schemes (for the construction, maintenance and/or improvement of national roads) must comply with the CPR. This requirement applies throughout all volumes and parts of the NRA DMRB, where a hEN is applicable.

1.27 The NRA in consideration of the basic requirements for construction works has herein set out the regulations for products incorporated into National Roads in Ireland for both harmonised and non-harmonised product standards

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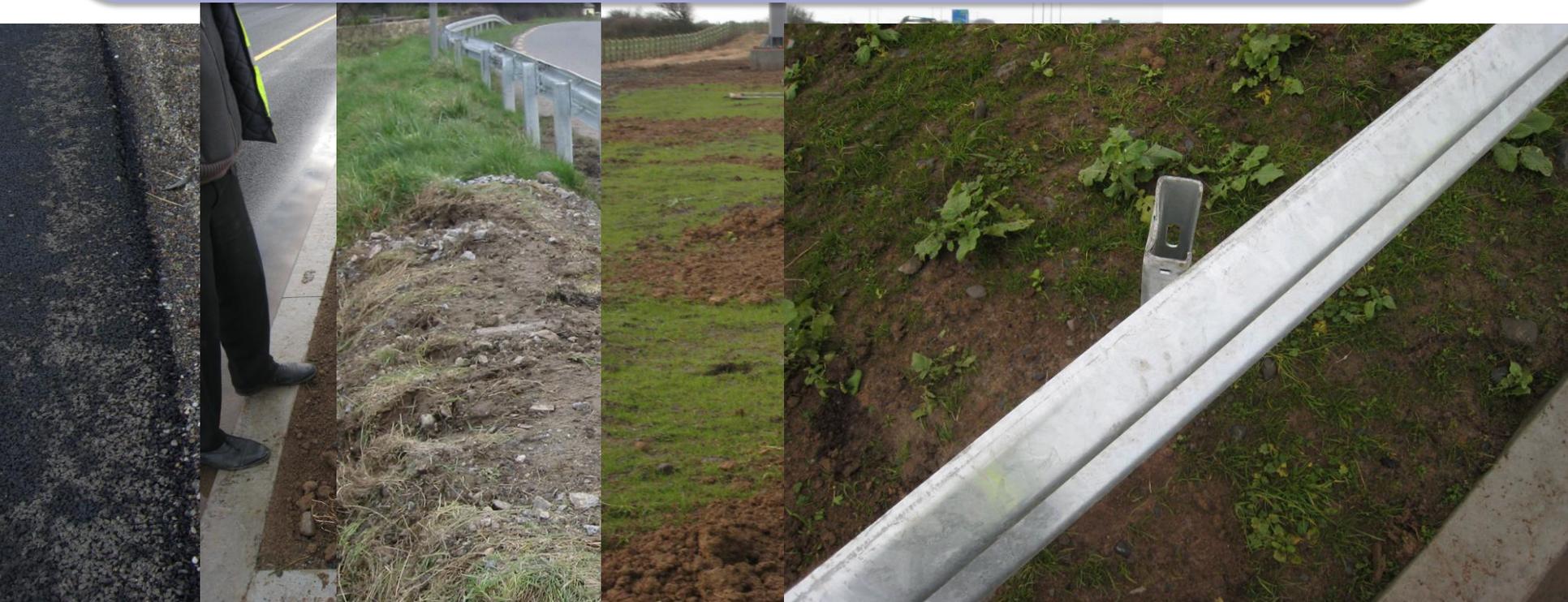
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Road Restraint Systems

- **Safety Barrier Design & Installation**
 - NRA TD 19 and Series 400
 - Need for Safety Barrier and Design Integration
 - Installation as per Manufacturers Instructions
 - CE Marking Requirements (CPR)
 - Checking on site



Road Restraint Systems



- **Safety Barrier Risk Assessment**

- Chapter 8 of NRA TD 19 for **Online Realignment**
- Collision Rates, Risk of Leaving the Road and Hazard Ranking
- Hazard Mitigation – remove, relocate or redesign?
- Report on decision-making



Road Restraint Systems



- **Bridge Parapet Updates (NRA BD 52)**
 - Reference to IS EN 1317 – compliance required
 - Minimum containment level requirements raised
 - Wide range of other changes
 - Series 400 updates complimentary

Significant Future Developments

Traffic Controls & Communications

Infrastructure Supporting Technology



Traffic Controls & Communications



Traffic Controls & Communications

- Infrastructure Design and Specification

- Ducting
- Chambers
- Loops Detectors
- Emergency Roadside Telephones
- Roadside Equipment

- NRA DMBR Documentation

- NRA HA 77; and
- NRA HD 20.

- NRA MCDRW Documentation

- Series 1500 Specification, NG, Method of Measurement, MMNG; and
- 67no. new Road Construction Drawings (RCDs)

Traffic Controls & Communications

- **Infrastructure Design and Specification**

- **Ducting**
- **Chambers**
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Traffic Controls & Communications



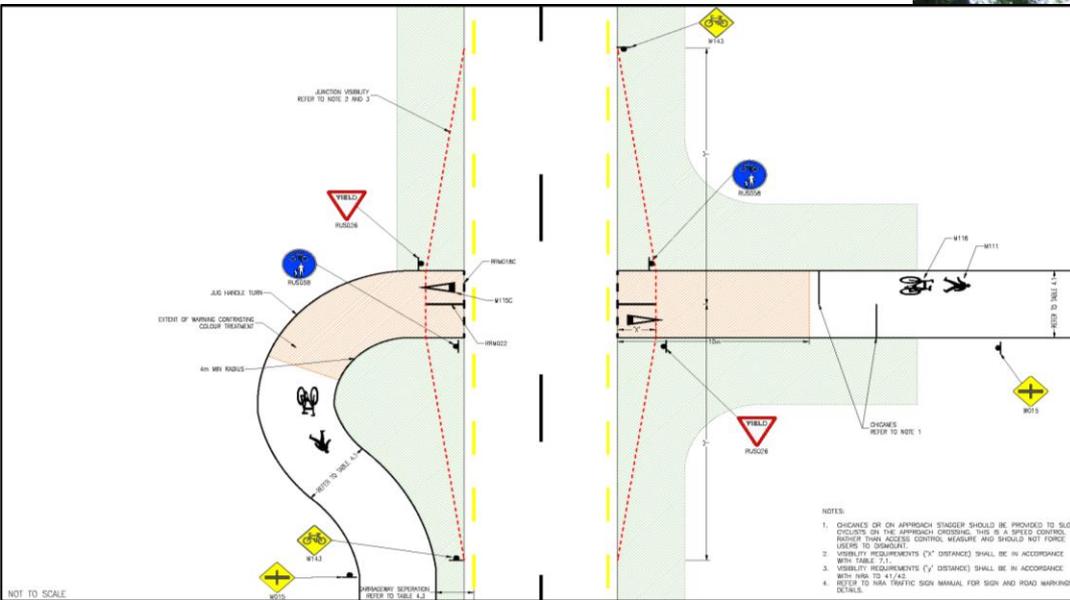
Rural Cycle Schemes

- National Cycle Network
- New NRA TD 300
- Cyclelanes, Cycletracks or Cycleways (Greenways)



Rural Cycle Schemes

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Rural Cycle Schemes

- National Cycle Network
- New NRA TD 300
- **Cyclelanes, Cycletracks or Cycleways (Greenways)**

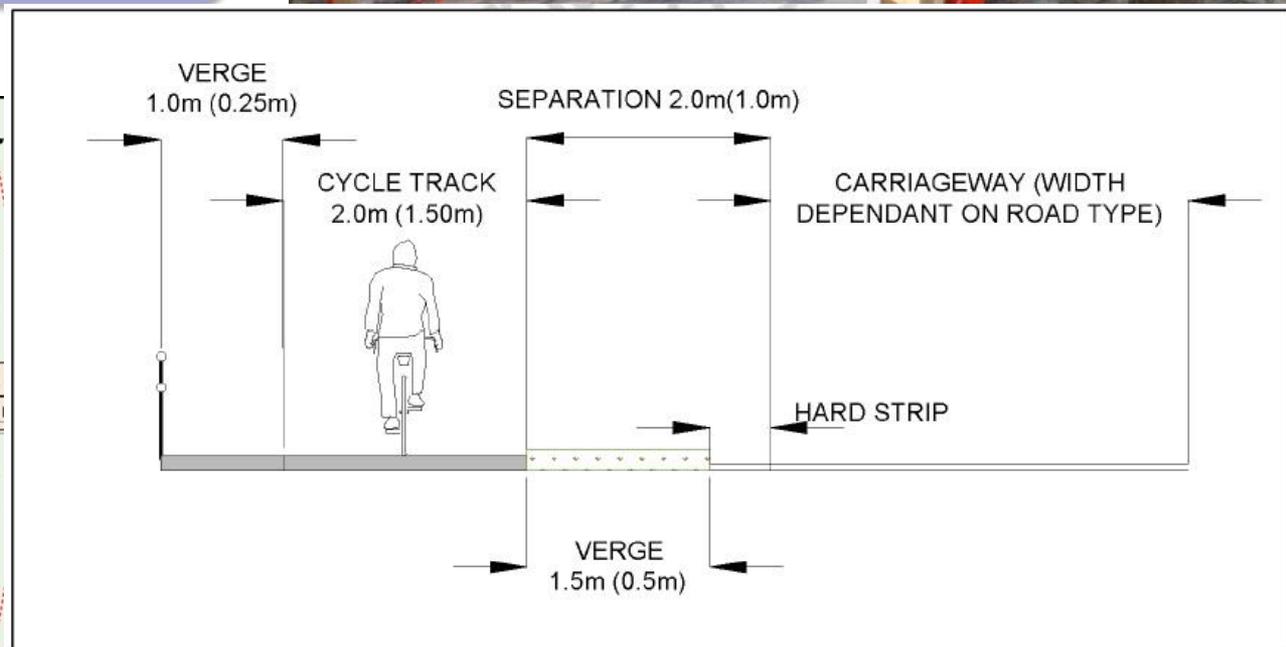
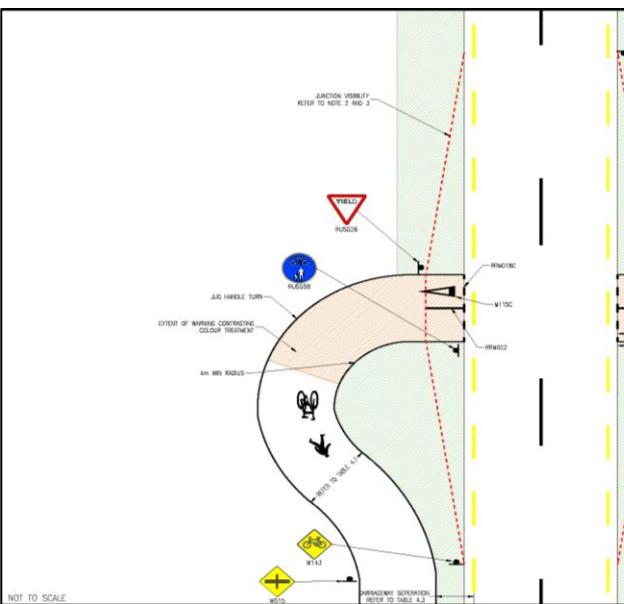
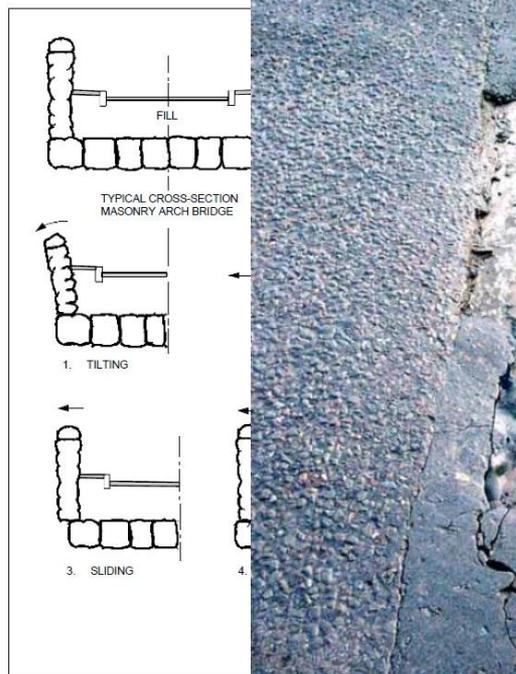


Figure 4.2: Off-Road One-Way Cycle Track (Low Volume)

Structures

- **NRA DMRB Volume 3**

- Inspection, Assessment, Maintenance and Repair (Background Reading)
- Creating a stand-alone Volume 3 within the NRA DMRB
- Adapting all documentation based on UK DMRB for use in Ireland
- Eurocodes not applicable to assessment
- Bring EIRSPAN documentation formally into the NRA DMRB



Structures

- **Masonry and Concrete Repair Specifications**

- Introducing Masonry Repair Specification
- Introducing Concrete Repair Specification
- Incorporating all relevant material specifications (incl. Euronorms)
- Ensuring references to legislation and procedures are for use in Ireland
- Addressing known developments in technology and methods



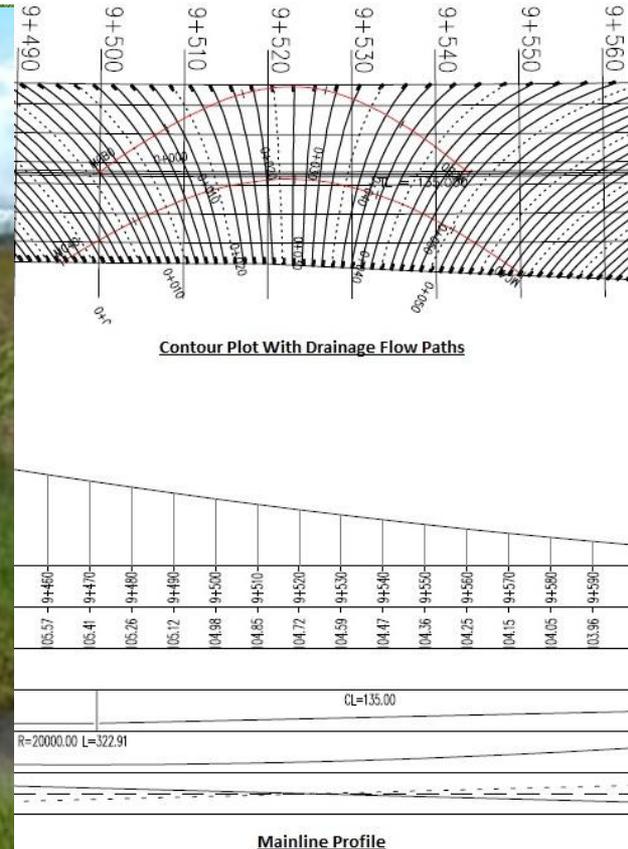
Structures



- **Structural Concrete Specification (Series 1700)**
 - Updates for IS EN 13670 Concrete Execution Standard;
 - Updates for materials standards against the latest Euronorms (ENs)
 - Review against Construction Products Regulations requirements
 - Review against the guidance in DuratiNet Technical Guide

Drainage

- **Over-arching Principles**
 - Sustainable Drainage Systems (SuDS)
 - Known Issues from Projects



Drainage

- **Some Key Issues**
 - Headwalls
 - Petrol/Oil Interceptors
 - Grassed Surface Water Channels
 - Sealed Systems
 - Estimation of Floods
 - Climate Change

Drainage

- **Some Key Issues**

- Headwalls
- Petrol/Oil Interceptors
- **Grassed Surface Water Channels**
- Sealed Systems
- Estimation of Floods
- Climate Change



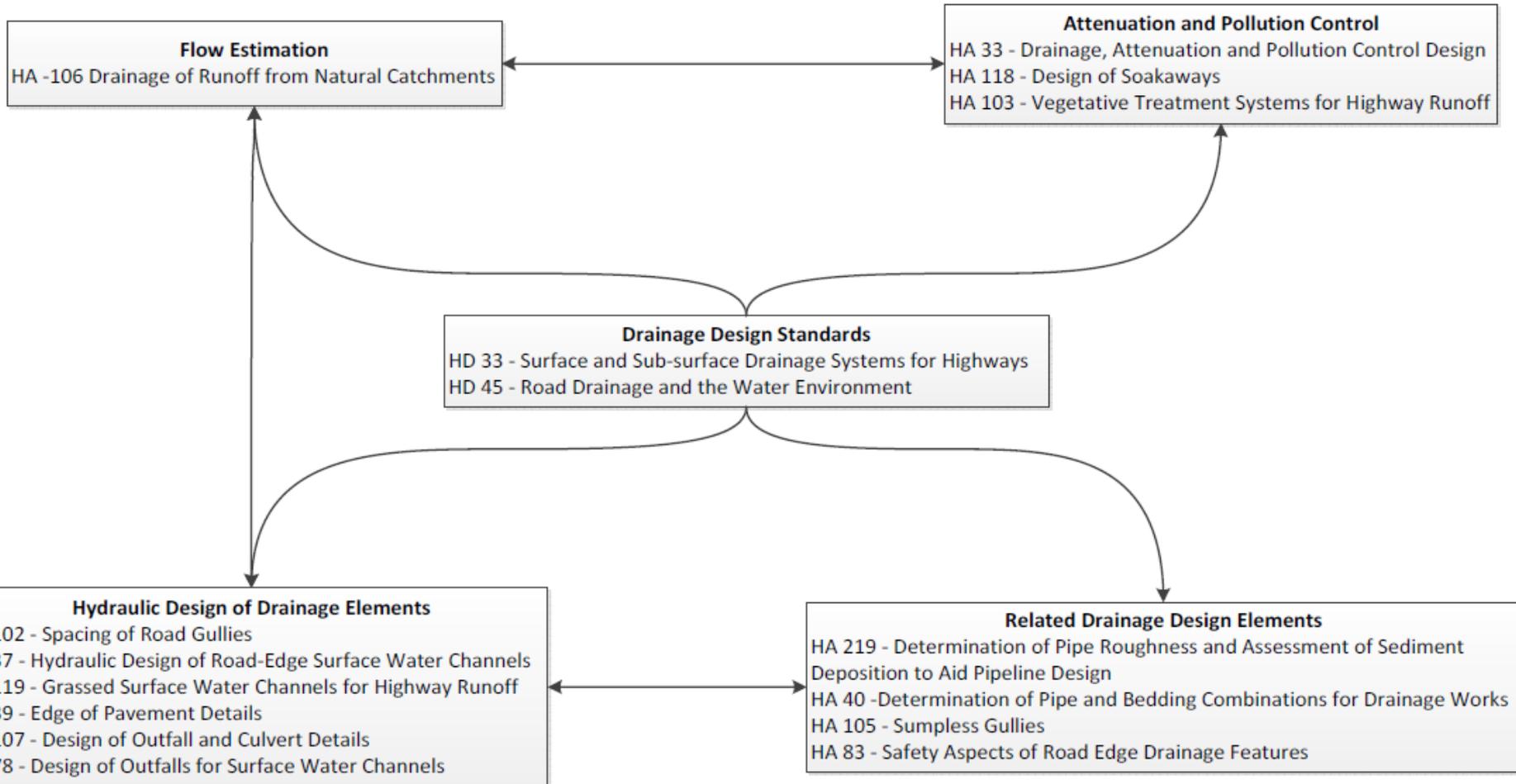
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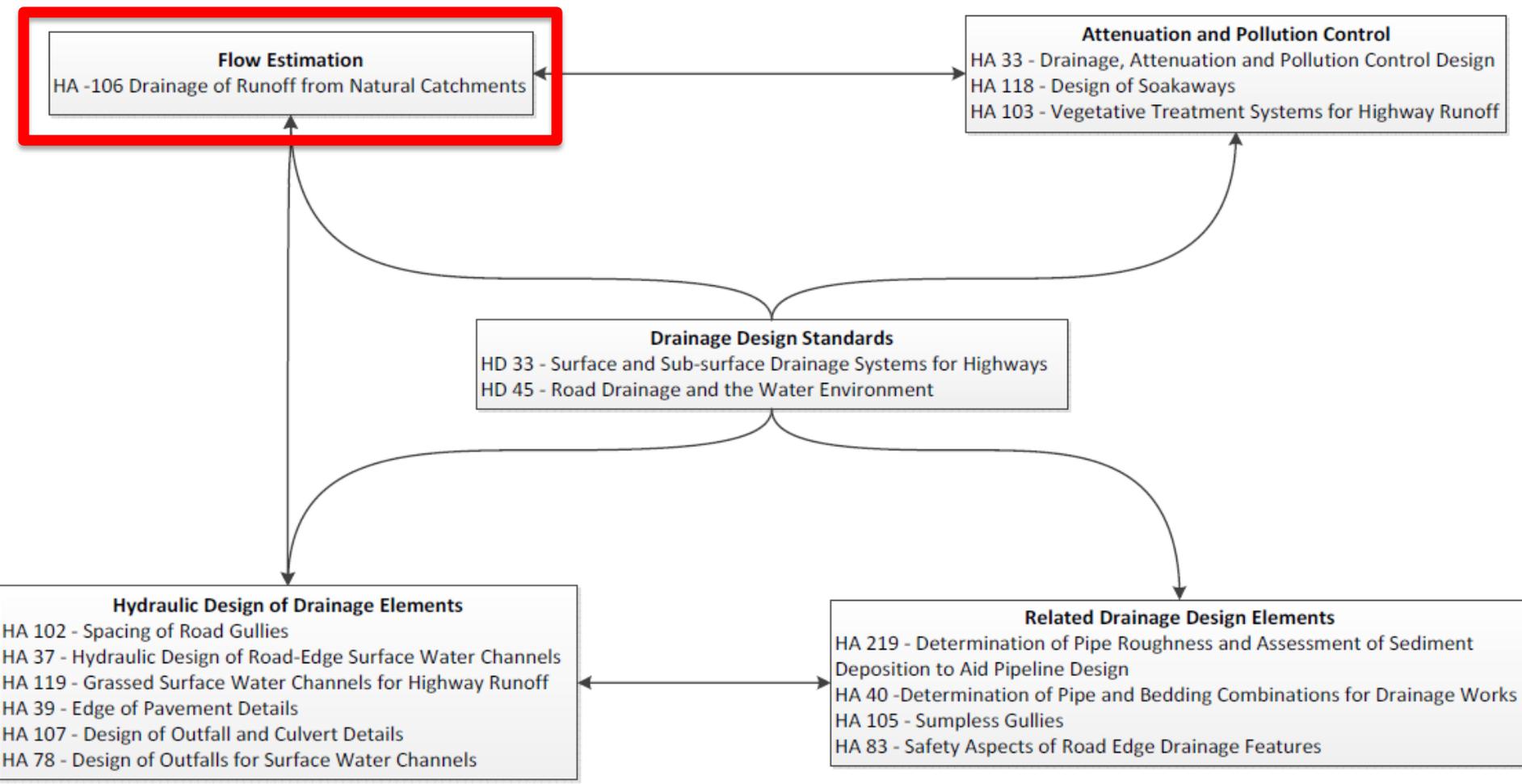
- **Standards and Advice**

- Root-and-Branch update considering current best practise
- Fully Stand-alone NRA documentation
- Standards & Advice Integration

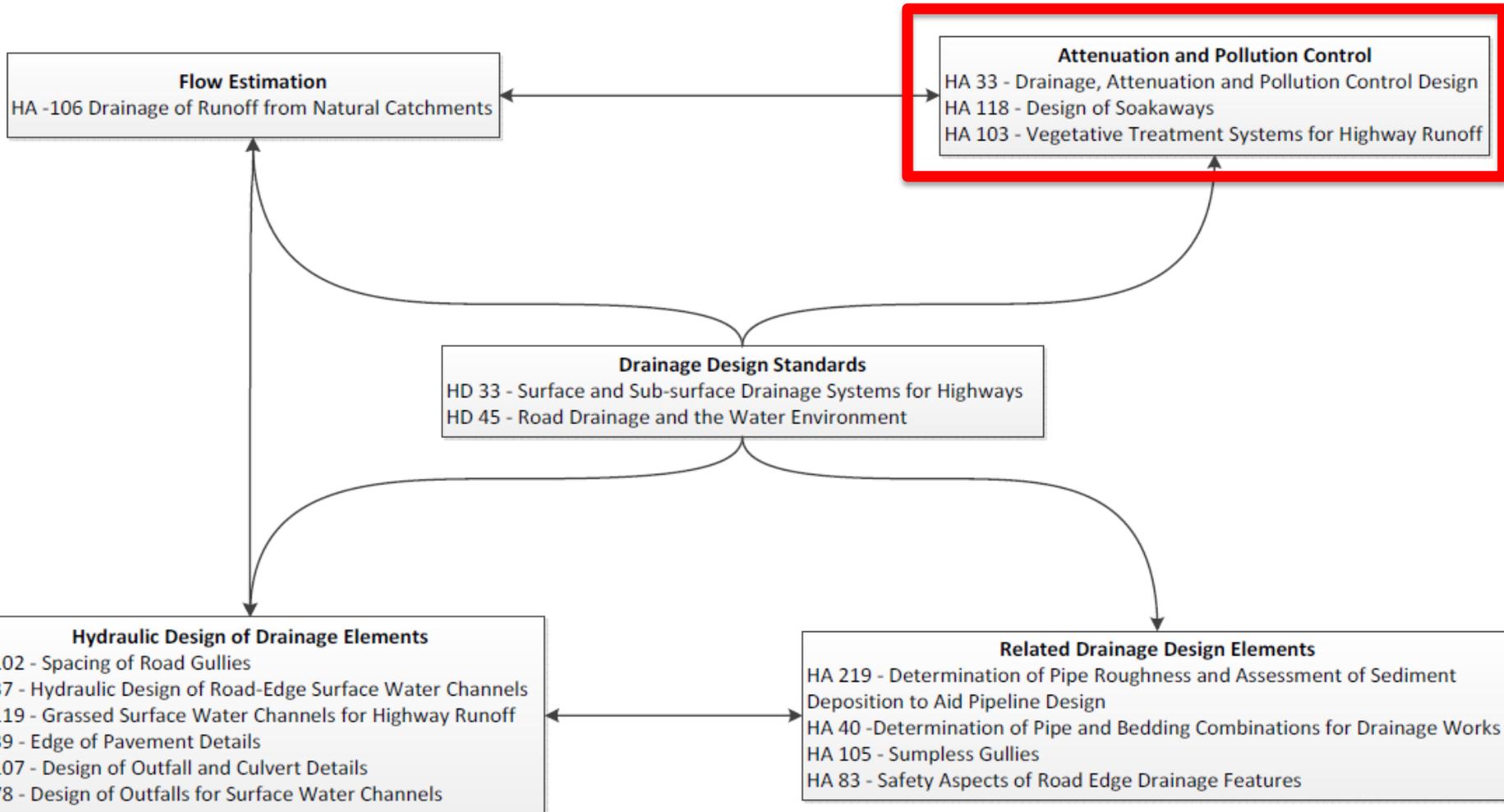
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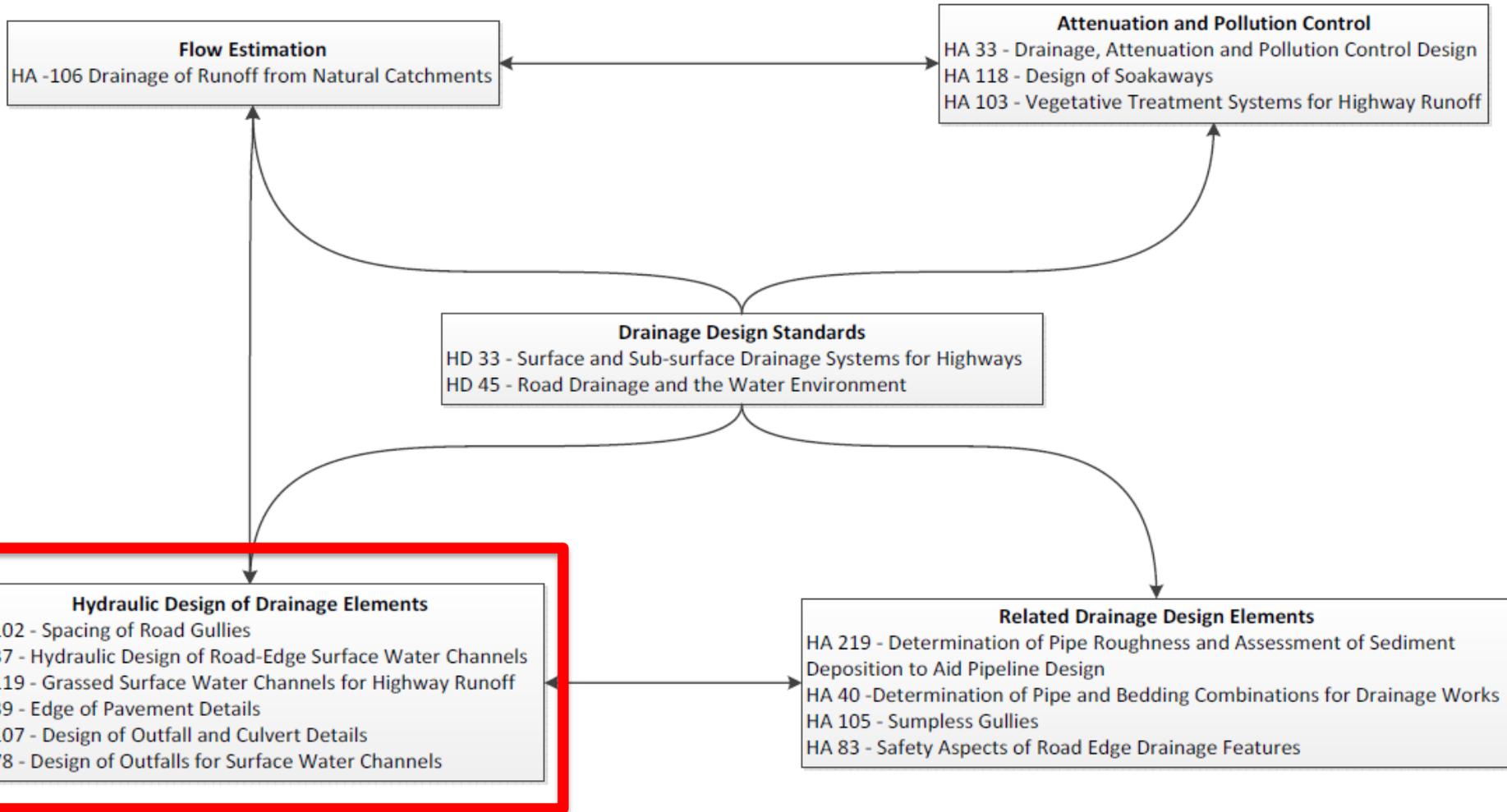
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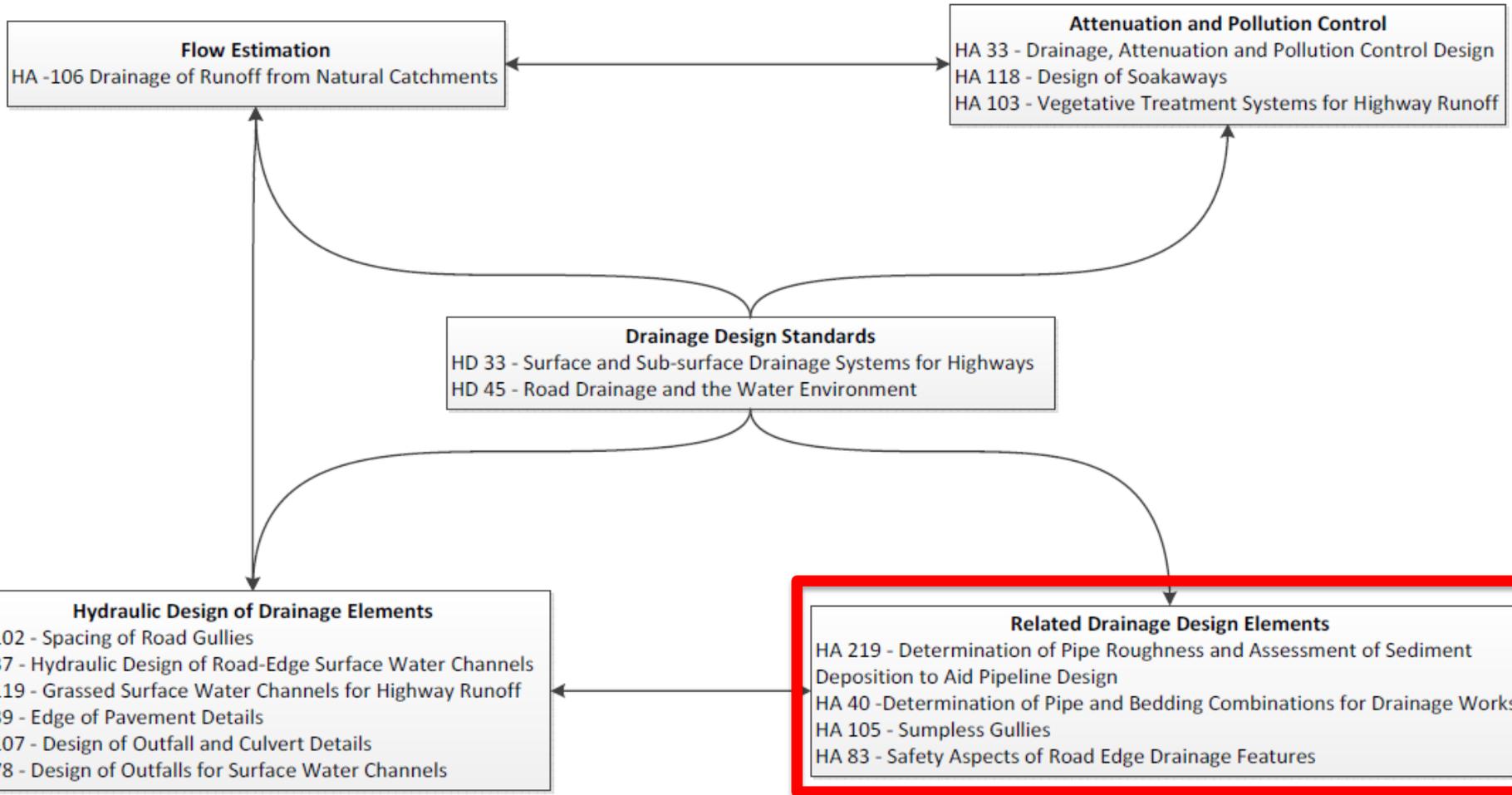
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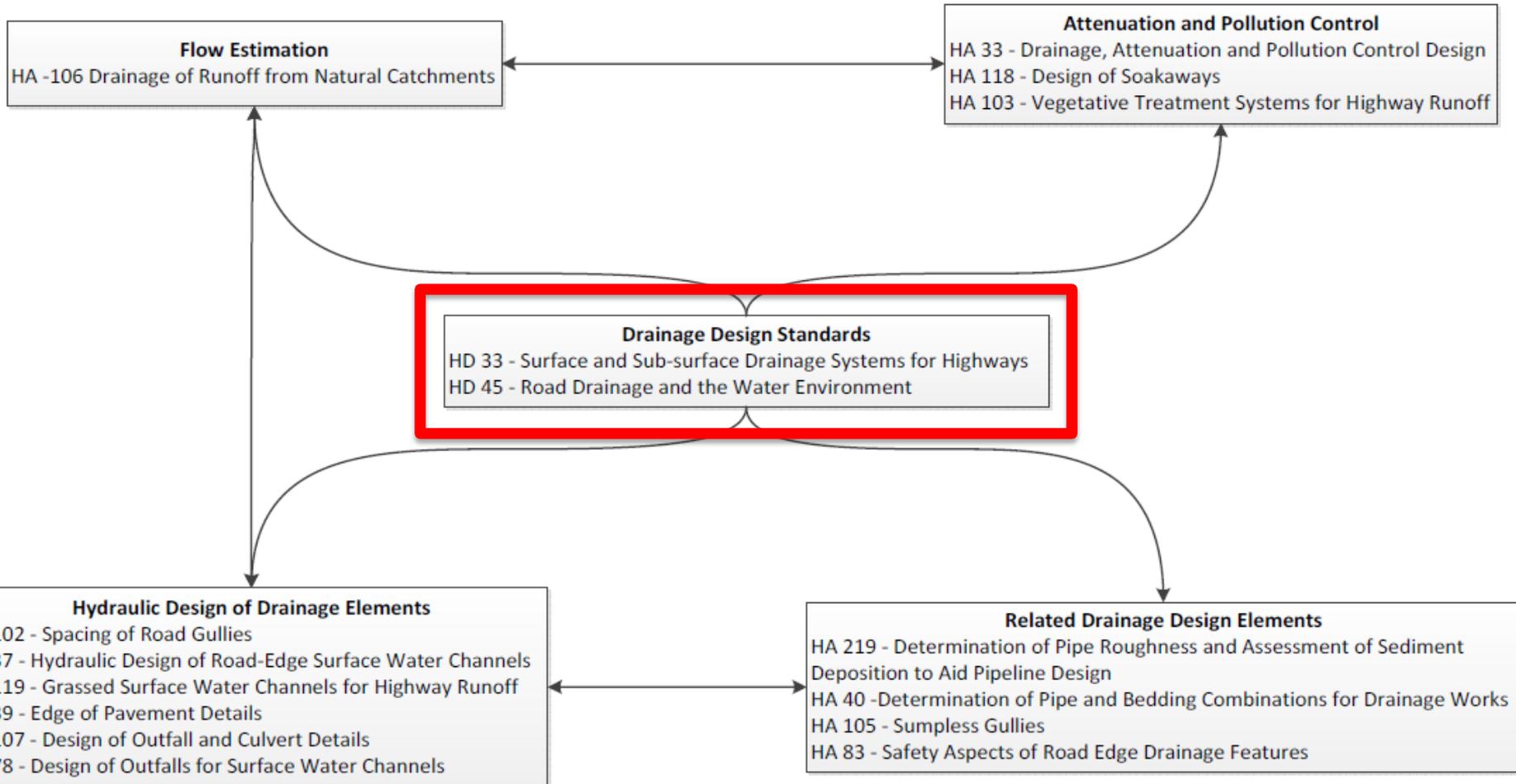
Drainage



Drainage



Drainage



Pavement

- **Surfacing – Design and Specification Updates**
 - New NRA HD 36 standard (withdrawal of NRA IAN 05/13) for Surfacing Materials for New and Maintenance Construction
 - New NRA HD 37 Bituminous Surfacing Materials and Techniques
 - Updates to NRA HD 28 Management of Skid Resistance
 - Updates to Series 900 addressing all related specification issues



Pavement



- **Permanent Repair Materials**

- New NRA IAN for Use of Permanent Repair Materials on National Roads
- New NRA IAN for Monitoring Procedures for PRM Systems
- New NRA IAN for Clause 946 Specification and Notes for Guidance for Use of PRM Systems
- To be fully brought into NRA DMRB and MCDRW in due course

Other Topics for Development

- Traffic Signs and Road Marking
- Road Safety
- Lighting
- Traffic Controls & Communications – Systems
- Others? – Priorities Change and Issues Arise Unexpectedly!!



Closing Comments

The Future – Where Are We Going?

- Greater convergence of International Standards?
- Increased priority on renewable energy in construction and vehicles using the network?
- New ways to approach maintenance in aging and new infrastructure?
- Smarter infrastructure meeting technological demands for more automation, positioning, communications, etc.. for users?
- Innovative methods and materials for improving safety critical interfaces, such as surfacing, restraint systems, etc..?
- Infrastructure that reacts to changing weather conditions?
- Availability of advanced booking for trips & rests on busy routes?

From NRA Standards

- NRA Standards and Specifications are at the core of all road and bridge projects in Ireland
- Continuous effort is made to identify and tackle priority issues
- Significant amount of work is completed and ongoing
- NRA Training Sessions are planned annually to assist users
- Every effort is made to respond to queries promptly
- Call on industry to actively highlight problems or queries....



From NRA Standards

...to help shape the standard of the future national road network!



NRA Standards and Specifications – Shaping the Future of National Roads

Thank You

Annual NRA National Roads Conference 2013 – Day 2, Thursday 10 October 2013