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Transport Infrastructure Ireland

## TII Publications



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# Loop Detectors for Motorways

**DN-ITS-03020**  
October 2013

## About TII

Transport Infrastructure Ireland (TII) is responsible for managing and improving the country's national road and light rail networks.

## About TII Publications

TII maintains an online suite of technical publications, which is managed through the TII Publications website. The contents of TII Publications is clearly split into 'Standards' and 'Technical' documentation. All documentation for implementation on TII schemes is collectively referred to as TII Publications (Standards), and all other documentation within the system is collectively referred to as TII Publications (Technical). This system replaces the NRA Design Manual for Roads and Bridges (NRA DMRB) and the NRA Manual of Contract Documents for Road Works (NRA MCDRW).

## Document Attributes

Each document within TII Publications has a range of attributes associated with it, which allows for efficient access and retrieval of the document from the website. These attributes are also contained on the inside cover of each current document, for reference. For migration of documents from the NRA and RPA to the new system, each current document was assigned with new outer front and rear covers. Apart from the covers, and inside cover pages, the documents contain the same information as previously within the NRA or RPA systems, including historical references such as those contained within NRA DMRB and NRA MCDRW.

## Document Attributes

<b>TII Publication Title</b>	<i>Loop Detectors for Motorways</i>
<b>TII Publication Number</b>	<i>DN-ITS-03020</i>

<b>Activity</b>	<i>Design (DN)</i>
<b>Stream</b>	<i>Intelligent Transport Systems (ITS)</i>
<b>Document Number</b>	<i>03020</i>

<b>Document Set</b>	<i>Standards</i>
<b>Publication Date</b>	<i>October 2013</i>
<b>Historical Reference</b>	<i>NRA HD 20</i>

## NRA DMRB and MCDRW References

For all documents that existed within the NRA DMRB or the NRA MCDRW prior to the launch of TII Publications, the NRA document reference used previously is listed above under 'historical reference'. The TII Publication Number also shown above now supersedes this historical reference. All historical references within this document are deemed to be replaced by the TII Publication Number. For the equivalent TII Publication Number for all other historical references contained within this document, please refer to the TII Publications website.

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## **Loop Detectors for Motorways**

**October 2013**

**Summary:**

This Standard specifies the standard of provision of detector loops on motorways.

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**VOLUME 9      TRAFFIC CONTROL AND  
SECTION 3      COMMUNICATIONS  
                    TRAFFIC CONTROL AND  
                    SURVEILLANCE**

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**PART 1**

**NRA HD 20/13**

**LOOP DETECTORS FOR MOTORWAYS**

**Contents**

Chapter

1. Introduction
2. Requirements and Implementation
3. Positioning and Spacing of Loop Detectors
4. References
5. Enquiries

# 1. INTRODUCTION

## General

- 1.1 It has been decided that loop detectors should be installed in new motorways, widened motorways, and in existing motorways during major maintenance, to provide for the future requirements of vehicle detection. These are expected to include automatic signal setting, incident detection, vehicle counting, and ramp metering. Installation in this way will avoid disruption to traffic at later date. This standard gives the requirements to lay loops and integrate them into the communications network. The electronics will be supplied through a specialist contract at a later date, as and when necessary.

## Scope

- 1.2 All proposed new motorways, and motorways to be widened. All existing motorways where major reconstruction or overlay is planned.

## 2. REQUIREMENTS AND IMPLEMENTATION

### Requirements

- 2.1 Detector loop shall be installed in the road pavement of all new motorways and widened motorways.
- 2.2 When existing motorways are reconstructed or overlaid detector loops shall be installed in the road pavement. The advice of the Road Authority shall be obtained for lengths of reconstruction of overlaid motorway below which detector loops need not be installed. This advice will be scheme specific.
- 2.3 Detector loops and their installation and layout shall comply with Clause 1523 of the NRA Specification for Road Works. Where the installation of loop detectors is procured through a contract incorporating the NRA Specification for Road Works. Products conforming to equivalent standards of other member states of the European Community will be acceptable in accordance with the terms of the Clauses 104 and 105. of that Specification. Any contract not containing these Clauses must contain a suitable clause of mutual recognition having the same effect regarding which advice should be sought.
- 2.4 The position and siting of loop detectors along the motorway shall be agreed in advance with the National Roads Authority.

### Implementation

- 2.5 This Standard should be used forthwith for all schemes for the construction and/or improvement of motorways funded by the National Roads Authority. The Standard should be applied to the design of schemes already being prepared unless, in the opinion of the National Roads Authority, application would result in significant additional expense or delay progress. In such cases, Design Organisations should confirm the application of this Standard to particular schemes with the National Roads Authority.

## 3. POSITIONING AND SPACING OF DETECTOR LOOPS

### Scope

- 3.1 This chapter primarily addresses loops to be used for Automatic Incident Detection (AID) schemes complying with the criteria and requirements set by the Road Authority. The advice of the Road Authority shall be obtained for other applications such as vehicle counting.

### General Requirements

- 3.2 The installation of detector loops shall comply with Clause 1523 of the NRA Specification for Road Works.
- 3.3 The installation and layout of loops shall comply with the RCD drawings.
- 3.4 Loop pairs shall be installed in all running lanes of both carriageways, in exit and entry slip road lanes at junctions, and throughout the running lanes of motorway-to-motorway link roads.
- 3.5 Primary loop tails shall be jointed to the red and blue cores and the secondary loop tails to the yellow and black cores of the feeder cables.
- 3.6 Feeder cables from loop sites shall be terminated at terminal blocks fitted inside the cabinet.

### Loop Site Positioning and Spacing

- 3.7 Positioning and spacing are the two steps that are taken sequentially in determining the locations of a series of loop sites. Positioning is determining the location of the loop site in relation to the signal. Spacing is determining the location(s) of the loop sites between signals.

### Loop Site Positioning

- 3.8 The objective is to site loops where they are required to detect traffic queues. Where used in conjunction with lane signalisation this is just upstream of signals so that the signal settings relate as closely as possible to the traffic conditions. This position shall be 10m plus or minus 20% upstream from the chosen reference signal. Where existing loops are installed they may be used if they are within 10m downstream or 50m upstream of the reference signal.



### Loop Site Spacing

- 3.9 Loop sites shall be spaced at intervals of 500m plus or minus 20%. The overall average loop site spacing for a scheme shall be 500m plus or minus 10%.
- 3.10 Where signals are sited at spacings between 600m and 1km an intermediate loop site shall be provided equidistant between the signal sites to maintain the 500m average spacing. Where signals are positioned at intervals below 600m an intermediate loop will not be required.

### Link Roads and Slip Roads

- 3.11 On exit slip roads, the loops shall be sited between 10m upstream from the final signal gantry or route confirmatory sign and a maximum of 50m downstream of the soft nose of the diverge, that is, the point of complete physical separation from the main carriageway.
- 3.12 On entry slip roads the loops shall be sited downstream of entry slip signals at a minimum distance of 100m from the convergent point with the motorway.
- 3.13 Entry slip and exit slip loops shall be sited in line plus or minus 50m with the carriageway loops.
- 3.14 Within motorway to motorway link roads, loops shall be sited at a minimum distance of 100m from the diverge and converge points. Between these two sites the standard 500m plus or minus 20% spacing criteria shall apply.

## **4. REFERENCES**

### **4.1 National Roads Authority Publications:**

NRA Design Manual for Roads and Bridges (NRA DMRB)

NRA Manual of Contract Documents for Road Works (NRA MCDRW)

## 5. ENQUIRIES

- 5.1 All technical enquiries or comments on this document, or any of the documents listed as forming part of the NRA DMRB, should be sent by e-mail to [infoDMRB@nra.ie](mailto:infoDMRB@nra.ie), addressed to the following:

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