



Bonneagar Iompair Éireann
Transport Infrastructure Ireland

TII Publications

GE PE DN CC OP AM RE

Notes for Guidance on the Specification for Road Works Series NG 1200 - Traffic Signs and Road Markings

CC-GSW-01200

December 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inside cover pages, the documents contain the same information as previously within the NRA or RPA systems, including historical references such as those contained within NRA DMRB and NRA MCDRW.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

TII Publication Title	<i>Notes for Guidance on the Specification for Road Works Series NG 1200 - Traffic Signs and Road Markings</i>
TII Publication Number	<i>CC-GSW-01200</i>

Activity	<i>Construction & Commissioning (CC)</i>
Stream	<i>Guidance on Specification for Works (GSW)</i>
Document Number	<i>01200</i>

Document Set	<i>Standards</i>
Publication Date	<i>December 2013</i>
Historical Reference	<i>Series NG 1200</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NRA MCDRW prior to the launch of TII Publications, the NRA document reference used previously is listed above under 'historical reference'. The TII Publication Number also shown above now supersedes this historical reference. All historical references within this document are deemed to be replaced by the TII Publication Number.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.

TRAFFIC SIGNS AND ROAD MARKINGS

Contents

<i>Clause</i>	<i>Title</i>	<i>Page</i>
NG 1200	General	2
NG 1201	Definitions, Sign Classification and Regulations	2
NG 1202	General Requirements for Permanent Traffic Signs	2
NG 1203	Permanent Traffic Sign System.....	2
NG 1204	Posts for Permanent Traffic Signs.....	3
NG 1205	Foundations for Permanent Traffic Signs	3
NG 1208	Gantries for Traffic Signs.....	3
NG 1209	Preparation and Finish of Metal or Other Surfaces	3
NG 1212	Employer's and Contractor's Temporary Traffic Signs	3
NG 1215	Traffic Signals	3
NG 1216	Road Markings	4
NG 1217	Road Studs	4
NG 1218	Pedestrian Crossings	5
NG SAMPLE APPENDIX 12/1	TRAFFIC SIGNS: GENERAL.....	6
NG SAMPLE APPENDIX 12/2	TRAFFIC SIGNS: REFLECTIVE MARKERS	6
NG SAMPLE APPENDIX 12/3	TRAFFIC SIGNS: ROAD MARKINGS AND STUDS	7
NG SAMPLE APPENDIX 12/4	TRAFFIC SIGNS: CONES AND CYLINDERS	7
NG SAMPLE APPENDIX 12/5	TRAFFIC SIGNS: TRAFFIC SIGNALS	7
NG SAMPLE APPENDIX 12/5	TRAFFIC SIGNS: TRAFFIC SIGNALS (Continued).....	9
NG SAMPLE APPENDED 12/5	TRAFFIC SIGNS: TRAFFIC SIGNALS (Continued).....	10
NG SAMPLE APPENDIX 12/6	TRAFFIC SIGNS: SPECIAL SIGN REQUIREMENTS ON GANTRIES	11
NG SAMPLE APPENDIX 12/7	TRAFFIC SIGNS: PREPARATION AND FINISH OF METAL AND OTHER SURFACES	11

Traffic Signs and Road Markings

NG 1200 General

- 1 The 1200 Series covers all traffic signs including Permanent, Employer's Temporary and Contractor's Temporary Traffic Signs. It draws on the Department of Transport Traffic Signs Manual (2010), the Road Traffic Regulations and I.S. EN 12899 for the majority of its requirements.

NG 1201 Definitions, Sign Classification and Regulations

- 1 The Employer's Representative should review the Contractor's proposals for Temporary Traffic Signs and should discuss these with the Contractor, the Garda Siochana and the appropriate Road Authority.
- 2 The information to be provided in Appendix 12/1 for Employer's Temporary Traffic signs should be the same as that for Permanent Traffic signs.
- 3 For CE Marking requirements for Traffic signs please refer to NRA MCDRW, Volume 0, Section 0, Part 1, NRA SD 01/13, Paragraph 1.12.
- 4 Checks should be carried out to ensure that current legal requirements have been met before a traffic sign is installed.

NG 1202 General Requirements for Permanent Traffic Signs

- 1 Appendix 12/1 shall include a Schedule of Traffic Signs containing the details listed in sample Appendix 12/1 and shall also contain all the other information required to supplement the Specification Clauses which state 'as described in Appendix 12/....'. This other information may be shown on fully detailed drawings cross-referenced from the relevant Appendix.
- 2 Full details of Contract specific traffic signs (e.g. directional information signs) should be shown on detailed drawings listed in Appendix 12/1.
- 3 The faces of non-prescribed traffic signs that have been authorised by the National Roads Authority or Department of Transport as appropriate should also be detailed on drawings listed in Appendix 12/1.
- 4 Traffic signs which have standard symbols (regulatory and warning signs) and markings need not be drawn in detail. These signs are shown in the Department of Transport Traffic Signs Manual. The figure number and the overall size of the sign or where no size is given, the x height of lettering required should be included in Appendix 12/1.

NG 1203 Permanent Traffic Sign System

- 1 The performance requirements for traffic sign faces shall be as per Table 12/3 and included in Appendix 12/1.
- 2 Stiffening systems (channels) shall be compatible with the support system (brackets) provided.

NG 1204 Posts for Permanent Traffic Signs

- 1 The specialist responsible for the design should decide the number, type, size and material of the post/posts required to satisfy the performance requirements of IS EN 12899.
- 2 Bolts used to fix flange plates to an adjoining surface should be fitted in a manner which does not pose a trip hazard. If a flange plate is located within a footpath or cycle track, dome covers should be installed over the bolts.
- 3 For signs with two posts, no post shall be positioned within 100mm of the edge of the sign plate in order to reduce the potential for damaging the sign plate.

NG 1205 Foundations for Permanent Traffic Signs

- 1 The design of concrete foundations should be prepared by the specialist responsible for the design using the parameters in Table 12/2 and by calculating the wind pressure values using the methodology described in I.S. EN 1991-1-4:2005 to achieve the wind loading values.

NG 1208 Gantries for Traffic Signs

- 1 The Employer's requirements for traffic signs on gantries including variable message signs and matrix signals should be included in Appendix 12/1.
- 2 The requirements for fabricated steel gantries which include sign supports and electrical apparatus e.g. cable trays etc. should be given in Appendix 12/6.

NG 1209 Preparation and Finish of Metal or Other Surfaces

- 1 Any additional requirements not contained in I.S. EN 12899 or requirements different to those stated, should be contained in Appendix 12/7

NG 1212 Employer's and Contractor's Temporary Traffic Signs

- 1 Temporary Traffic Signs are designed for short term use (less than 3 months). Where a Temporary Traffic Sign is required for greater than 3 months the sign face and substrate shall comply with the requirements for Permanent Traffic Sign Systems in Clause 1203.

NG 1215 Traffic Signals

General

- 1 Information on the installation and maintenance of permanent traffic signals together with technical advice is available from the appropriate Road Authority.
- 2 The installation and commissioning of traffic signal controllers is a task calling for specialist skills and experience in this type of work. The Employer's Representative should satisfy himself/herself that, if the Contractor wishes to sub-contract the work under Clause 5.4 of the Public Works Contracts, any sub-contractor proposed has the necessary skills and experience.
- 3 The compiler should describe their requirements for permanent traffic signals, including installation of loop detector cables in Appendix 12/5. This should be written for the particular installation ensuring compatibility with the 1200 Series, 1400 Series and the 1500 Series.
- 4 The compiler should specify the cable core to function allocation for all cables.

-
- 5 Any special requirements for servicing of the equipment once in use should be included in Appendix 12/5.

NG 1216 Road Markings

Permanent Road Markings

- 1 For road markings on all purpose roads and motorways, reference should be made to the Department of Transport Traffic Signs Manual.
- 2 It should be stated in Appendix 12/3 (cross-referring to the appropriate drawing) where thermoplastic, preformed or other materials are required and, if thermoplastic, whether it should be screed, extrusion, profiled, preformed or spray applied.
- 3 Thermoplastic material, whether screed, extrusion, profiled, preformed or spray applied is recommended for use on all types of roads particularly those that carry a heavy flow of vehicles and at locations which are subject to turning movements.
- 4 The following additional information should be stated in Appendix 12/3:
- (i) Whether a tack coat is to be used. Generally a tack coat is only required on concrete or on old, polished surfaces.
 - (ii) Whether white or yellow colour is required.
 - (iii) Whether raised profile edge markings are required,
 - (iv) Where gaps are required in raised profile edge markings they should be spaced as per the guidance in the Traffic Signs Manual

Temporary Road Markings

- 5 The compiler should include in Appendix 12/3 the limitations as to where certain types of prefabricated materials will be acceptable. For example materials which are only available in 100 mm and 150 mm wide strips should not be used to form arrows, lettering, chevron markings or yield symbols. Prefabricated materials should not be used on rough surfaces such as a surfaced dressed finish.
- 6 Where there is a requirement to remove or cover existing road markings at road works, Appendix 12/3 should specify, according to site conditions, either permanent removal or the use of black masking material. If the black masking materials are required to be removable, they should be constructed from a proprietary preformed black masking material.

NG 1217 Road Studs

Reflecting Road Studs

- 1 For road studs on all purpose roads and motorways, reference should be made to the Department of Transport Traffic Signs Manual.
- 2 The locations where reflecting road studs are to be used, together with any other requirements should be stated in Appendix 12/3.

-
- 3 Reflecting road studs should not be installed by any method other than that recommended by the manufacturer and approved by the Road Authority. Full compliance with these installation instructions is essential. Some general advice for the installation of road studs is also included in IS EN 1463-1.
 - 4 Temporary reflecting road studs are special studs designed to be effective for a minimum of 3 months. After this period their colour may deteriorate and compliance with the photometric and colorimetric values may be outside the set limits. If the period of installation is expected to be greater than 3 months, the temporary studs should be examined and renewed as necessary. Permanent reflecting road studs may be used with the Employer's Representative's approval, depending on the total expected duration and site conditions of the Works.

NG 1218 Pedestrian Crossings

- 1 The compiler should describe the requirements for pedestrian crossings in Appendix 12/5.
- 2 The required type, e.g. thermoplastic material, whether screed or extrusion applied for road markings related to pedestrian crossings other than on the crossing area should be stated in Appendix 12/5.
- 3 For the crossing area, the required material, e.g. screed applied thermoplastic or prefabricated plastic tiles, should also be stated in Appendix 12/5. The choice of material should be decided by the compiler based upon traffic flows or other requirements specific to the Site.

SAMPLE APPENDICES

[Note to compiler: Include in Appendices 12/1 to 12/8 the information listed below, referring to any drawing numbers where this information is otherwise located.]

NG SAMPLE APPENDIX 12/1 TRAFFIC SIGNS: GENERAL

1 Schedule of Traffic Signs:

- i) Location of traffic signs other than those included in Appendices 12/2 to 12/7 inclusive.
- ii) Drawing numbers giving Contract-specific details or figure number in the Department of Transport Traffic Signs Manual.
- iii) Overall sizes of sign plates.
- iv) Requirements for type of material, preparation and finish for traffic sign systems.
- v) The type of sign face material including the performance class of any retroreflective material.
- vi) The number, type and size of posts including details of any baseplates or flange plates.
- vii) Details of ground screws, retention sockets or anchor bolts.
- viii) Details of foundations including cable ducting, reinstatement and any requirements for anchorages and attachment systems including their loadings and torque settings.
- ix) Details of any electrical equipment compartments.

2 In addition, the following information should be given:

- i) Any particular requirement for the covering of signs.
- ii) Where sign fabrication drawings are not required, the details to be provided for warning and regulatory signs.
- iii) Details of location identifying marks.

NG SAMPLE APPENDIX 12/2 TRAFFIC SIGNS: PERMANENT BOLLARDS, DELINEATOR POSTS AND REFLECTIVE MARKERS

- (i) The performance class of any retroreflective material.
- (ii) The impact resistance of permanent reboundable bollards and delineator posts.
- (iii) Fixings for permanent bollards, delineator posts and retroreflective markers.
- (iv) The types and requirements for retroreflective markers and delineator posts.

- (v) The testing requirements and method of testing of permanent bollards, delineator posts and retroreflective markers.

NG SAMPLE APPENDIX 12/3 TRAFFIC SIGNS: ROAD MARKINGS AND STUDS

- (i) Requirements for permanent road markings including colour, location and material type. [Any requirements for reflectorisation and for a tack coat should also be stated as should those for raised profile edge markings.]
- (ii) Locations where class S3 or higher skid resistance to Table 7 of IS EN 1436 is required for permanent road markings.
- (iii) Locations where gaps are required in raised profile edge markings.
- (iv) Requirements for temporary road markings.
- (v) Limitations on the use of prefabricated temporary road marking materials.
- (vi) Requirements and locations for retroreflecting road studs.
- (vii) Requirements for the temporary covering of road studs and road markings.

NG SAMPLE APPENDIX 12/4 TRAFFIC SIGNS: CONES AND CYLINDERS

- (i) Types of traffic delineators other than cones and cylinders.
- (ii) The requirements and method of testing delineators other than cones and cylinders [cross referenced in Appendix 1/5].

NG SAMPLE APPENDIX 12/5 TRAFFIC SIGNS: TRAFFIC SIGNALS

1 Permanent Traffic Signals

- (i) Locations for:
 - (a) Signal heads.
 - (b) Controller.
 - (c) Ducting of carriageway and cable crossings.
 - (d) Electricity supply.
 - (e) Detection (including control units).
 - (f) Posts and gantries.
 - (g) Cables and routes.

- (h) Telecommunications carrier interface.
- (i) Inspection chambers.
- (j) Road markings.

NG SAMPLE APPENDIX 12/5 TRAFFIC SIGNS: TRAFFIC SIGNALS (Continued)

- (i) Equipment:
 - (a) Vehicular signal heads.
 - (b) Pedestrian signal heads.
 - (c) Signal heads for cyclists.
 - (d) Light Rapid Transit (LRT) signal heads.
 - (e) Push buttons for pedestrians (including audible and tactile equipment).
 - (f) Additional signs.
 - (g) Green arrow aspects.
 - (h) Twin head or more with or without combinations of the above.
- (ii) Operation:
 - (a) Phasing/staging.
 - (b) Timings.
 - (c) Special functions.
 - (d) Linking.
- (iii) Detection:
 - (a) Type (Loop and above ground detection).
 - (b) Loop: location, configuration, size, shape, facilities.
 - (c) Power supply and cabling.
- (iv) Testing:
 - (a) Factory.
 - (b) Site.
- (v) Special road surfacing.
- (vi) Locations of other services (gas, water, electricity, etc.).
- (vii) Maintenance and servicing requirements.

NG SAMPLE APPENDED 12/5 TRAFFIC SIGNS: TRAFFIC SIGNALS (Continued)

1 Temporary Traffic Signals Specified by the Engineer

Generally as for 1 above with the exclusion of:

- (i) as this is liable to alteration during the progress of Works, it should state at what stages during the Works temporary traffic signals are required.
- (iii) (b) to (d) inclusive.
- (v) (a).
- (vi)
- (vii)
- (viii)

Add with regard to:

- (i) "a power supply may be a portable generator".
- (ii) cable crossing protection.

Traffic Signs

1 Signal Pedestrian Crossings

[Generally as for 1 above.]

2 Zebra Crossings

- (i) Location.
 - (a) Road markings.
 - (b) Beacons.
 - (c) Electricity supply.
- (ii) Materials.
 - (a) Road surfacing.
 - (b) Road markings.

1 Specifications

- (i) traffic signal equipment.
- (ii) controllers.

- (iii) cabling.
- (iv) detector loops.
- (v) testing specifications.

NG SAMPLE APPENDIX 12/6 TRAFFIC SIGNS: SPECIAL SIGN REQUIREMENTS ON GANTRIES

- (i) Material and constructional requirements for gantries.
- (ii) Mounting details for traffic signs on gantries.

[Electrical equipment should be described in Appendix 14/5. Traffic signs including variable message signs and matrix signals should be described in Appendix 12/1.]

NG SAMPLE APPENDIX 12/7 TRAFFIC SIGNS: PREPARATION AND FINISH OF METAL AND OTHER SURFACES

[Note to compiler: List here any additional requirements not contained in Clause 1208, or requirements different to those therein.]



Bonneagar Iompair Éireann
Transport Infrastructure Ireland



Ionad Ghnó Gheata na
Páirce,

Stráid Gheata na Páirce,
Baile Átha Cliath 8, Éire



Parkgate Business Centre,
Parkgate Street,
Dublin 8, Ireland



www.tii.ie



info@tii.ie



+353 (01) 646 3600



+353 (01) 646 3601