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Transport Infrastructure Ireland

## TII Publications

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# Method of Measurement for Road Works Series MM 1400 - Electrical Work for Road Lighting and Traffic Signs

**CC-RMP-01400**

March 2011

## 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inside cover pages, the documents contain the same information as previously within the NRA or RPA systems, including historical references such as those contained within NRA DMRB and NRA MCDRW.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>Method of Measurement for Road Works Series MM 1400 - Electrical Work for Road Lighting and Traffic Signs</i>
<b>TII Publication Number</b>	<i>CC-RMP-01400</i>

<b>Activity</b>	<i>Construction &amp; Commissioning (CC)</i>
<b>Stream</b>	<i>Requirements for Measuring and Pricing (RMP)</i>
<b>Document Number</b>	<i>01400</i>

<b>Document Set</b>	<i>Standards</i>
<b>Publication Date</b>	<i>March 2011</i>
<b>Historical Reference</b>	<i>Series MM 1400</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NRA MCDRW prior to the launch of TII Publications, the NRA document reference used previously is listed above under 'historical reference'.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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# Series 1400: Electrical Work for Road Lighting and Traffic Signs

## Locating Buried Road Lighting and Traffic Signs Cable

- |             |  |
|-------------|--|
| Units       | <p><b>1</b> The unit of measurement shall be:</p> <p>(i) locating buried road lighting and traffic signs cable..... linear metre.</p>  |
| Measurement | <p><b>2</b> The measurement shall be the length of the buried road lighting or traffic signs cable located (as this Series paragraph 7 for the measurement of cable).</p>      |
| Itemisation | <p><b>3</b> Separate items shall be provided for locating buried road lighting and traffic signs cable in accordance with Chapter II paragraphs 3 and 4 and the following:</p> |

Group	Feature
I	1 Locating buried road lighting and traffic signs cable
II	1 In carriageways, footways and bridge decks
	2 In verges, embankments and cuttings
	3 In central reserves

## Locating Buried Road Lighting and Traffic Signs Cable

- |               |  |
|---------------|--|
| Item Coverage | <p><b>4</b> The items for locating buried road lighting and traffic signs cable shall in accordance with the Preambles to Bill of Quantities General Directions include for:</p> <p>(a) marking the cable runs on the ground;</p> <p>(b) pegging and removal;</p> <p>(c) maintaining location system;</p> <p>(d) proving insulation integrity and supplying results to the Employer’s Representative;</p> <p>(e) site records.</p> |
|---------------|--|

## Cabling

- |       |  |
|-------|--|
| Units | <p><b>5</b> The units of measurement shall be:</p> <p>(i) trench for cable ..... linear metre.</p> <p>(ii) cable ..... linear metre.</p> |
|-------|--|

Measurement

- 6** The measurement of trench for cable shall be the summation of the distance along the centre line of the route between the following points:
- (a) face of foundation to post, road lighting column, Lit Sign Unit, feeder pillar, electricity supply point and the like;
  - (b) the intersection of the centre line of trenches at trench junctions;
  - (c) the position of trench terminations shown in the Contract.

The measurement of trench for cable shall be measured once only irrespective of the number of cables in the trench. The depth of cable trenches shall be the vertical measurement between the underside of the bedding, or if no bedding is specified the underside of the cable, and the Earthworks Outline.

- 7** The measurement of cable shall be the summation of the individual lengths along the centre line of the route between the points of cable termination at each item of equipment.

Points of cable termination shall be:

- (a) in the case of loop detector feeders – the point at which the cable enters the terminal block;
- (b) in all other cases – the point at which the cables enter the boxes, distributors, lighting columns, cut-outs and the like.

Itemisation

- 8** Separate items shall be provided for cabling in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Trench for cable, depth not exceeding 1.5 metres
	2 Trench for cable, depth exceeding 1.5 metres but not exceeding 2.0 metres and so on in steps of 0.5 metres
	3 Cable
II	1 Different widths of trench
	2 Different types and sizes of cable
III	1 Supplied by National Roads Authority

**Trench for Cable**

- 9** The items for trench for cable shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

- (a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);
- (b) excavation of unacceptable material (as Series 600 paragraph 19);
- (c) excavation in Hard Material (as Series 600 paragraph 23);
- (d) additional depth of excavation to maintain specified cover at obstructions;
- (e) additional excavation to accommodate extra lengths of cable;

- (f) locating, working around and supporting pipes, cables, services, apparatus and the like;
- (g) trimming, levelling and compacting;
- (h) cable bedding and covering;
- (i) backfilling and compaction;
- (j) troughing, lids, access points and bedding;
- (k) disposal of material (as Series 600 paragraph 39);
- (l) marking tape or cable covers;
- (m) reinstatement of surfaces;
- (n) site records.

**Cable**

**10** The items for cable shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

- (a) extra length of cable required for connection into a unit, future retermination and tying in;
- (b) unsealing, clearing and swabbing out ducts, drawing cables through, replacing draw ropes, plugging and sealing duct ends and marking;
- (c) intermediate supports and fixing devices where cables leave trench and prior to entry into equipment;
- (d) supports to vertical cables;
- (e) sealing to cable ends;
- (f) cutting, tying together, sealing, coiling and strapping of unused cores;
- (g) unscheduled joints;
- (h) marker blocks, marker tape, identification tags, sleeves and the like;
- (i) twisting and snaking;
- (j) preparation and supply of record drawings;
- (k) service connections and commissioning;
- (l) additional protection and support;
- (m) site records and colour coding.

**Cable Supplied by the National Roads Authority**

**11** The items for cable supplied by the National Roads Authority shall in accordance with the Preambles to Bill of Quantities General Directions include for:



- (o) site records.

**Feeder Pillars**

Units **16** The unit of measurement shall be:

- (i) feeder pillar ..... number.

Itemisation **17** Separate items shall be provided for feeder pillars in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Each type of feeder pillar
II	1 Supplied by National Roads Authority

**Feeder Pillars**

**18** The items for feeder pillars shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

- (a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);
- (b) excavation of unacceptable material (as Series 600 paragraph 19);
- (c) excavation in Hard Material (as Series 600 paragraph 23);
- (d) brickwork, blockwork and stonework (as Series 2400 paragraphs 4 and 8);
- (e) backfilling and compaction;
- (f) disposal of material (as Series 600 paragraph 39);
- (g) building in or forming cable ducts in bases;
- (h) concrete (as Series 1700 paragraphs 4 and 9);
- (i) formwork (as Series 1700 paragraph 14);
- (j) reinforcement (as Series 1700 paragraph 25);
- (k) removing knock-outs, drilling or forming holes and pockets and casting in bars, sockets, base plates, plinths and anchorage assemblies;
- (l) footways and paved areas (as Series 1100 paragraph 21);
- (m) adhesives and epoxy or polyester mortar, bedding mortar or grout;
- (n) backboards, fixings, protective caps, sealing, grommets, spacers, mounting plates and strips;

- (o) complying with wiring regulations and earthing (other than earth electrodes);
- (p) conduit including screwed and threaded connections, bends, tees and the like and draw wires;
- (q) electrical equipment, batteries, colour coding, wiring and making connections, excluding electricity supplier’s connection;
- (r) threading cable through ducts, sleeves, conduit and the like;
- (s) doors, locks and keys;
- (t) protective system (as Series 1900 paragraph 4);
- (u) notices, labelling, recording numbering and lettering;
- (v) in the case of equipment supplied by the National Roads Authority, loading, transporting from store, unloading and positioning for installation or re-installation and replacing items damaged in the foregoing operations;
- (w) filling, bedding and sealing;
- (x) cleaners, solvents and dessicants;
- (y) preparation and supply of record drawings;
- (z) service connections and commissioning.

**Feeder Pillars Supplied by the National Roads Authority**

**19** The items for feeder pillars supplied by the National Roads Authority shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

- (a) loading, transporting from store, unloading and positioning for installation or re-installation;
- (b) replacing items damaged in the foregoing operations;
- (c) modification and new materials;
- (d) feeder pillars (as this Series paragraph 18).

**Earth Electrodes**

Units

**20** The unit of measurement shall be:

- (i) earth electrodes ..... number.

Measurement

**21** The measurement of earth electrodes shall be the completion installation including conduit and cable between the structure, nearest Lit Sign Unit or lighting unit and the earth electrode.



Itemisation **22** Separate items shall be provided for earth electrodes in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Different types and sizes of earth electrodes

**Earth Electrodes**

**23** The items for earth electrodes shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item Coverage

- (a) excavation of acceptable material (as Series 600 paragraphs 17 and 18);
- (b) excavation of unacceptable material (as Series 600 paragraph 19);
- (c) excavation in Hard Material (as Series 600 paragraph 23);
- (d) backfilling and compaction;
- (e) disposal of material (as Series 600 paragraph 39);
- (f) in-situ concrete (as Series 1700 paragraph 4);
- (g) formwork (as Series 1700 paragraph 14);
- (h) driving;
- (i) clamps, cables and making connections;
- (j) reinforcement (as Series 1700 paragraph 25);
- (k) covers, frames, seating and bedding;
- (l) earthing rods including pressure plates, glands and clamps;
- (m) conductor cable including preparing, stripping and cleaning ends and connections;
- (n) conduit including all purpose-made screwed and threaded connections, bends, tees and the like and draw wires;
- (o) threading cable through ducts, sleeves, conduit and the like;
- (p) complying with wiring regulations;
- (q) markers, notices and recording;
- (r) preparation and supply of record drawings.



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