



Bonneagar Iompair Éireann
Transport Infrastructure Ireland

TII Publications



Method of Measurement for Road Works Series MM 2700 - Watermains, Utilities and Accommodation Works

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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inside cover pages, the documents contain the same information as previously within the NRA or RPA systems, including historical references such as those contained within NRA DMRB and NRA MCDRW.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>Method of Measurement for Road Works Series MM 2700 - Watermains, Utilities and Accommodation Works</i>
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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NRA MCDRW prior to the launch of TII Publications, the NRA document reference used previously is listed above under 'historical reference'. The TII Publication Number also shown above now supersedes this historical reference. All historical references within this document are deemed to be replaced by the TII Publication Number. For the equivalent TII Publication Number for all other historical references contained within this document, please refer to the TII Publications website.

Series 2700: Watermains, Utilities and Accommodation Works

Watermains

- | | | |
|-------------|---|--|
| Units | 1 | The units of measurement shall be: <ul style="list-style-type: none"> (i) watermains linear meter |
| Measurement | 2 | The measurement of watermains shall be the length along their centrelines and shall include lengths occupied by fittings and valves and hydrants. |
| | 3 | The depth of watermain pipes shall be the vertical distance between the invert and the following: <ul style="list-style-type: none"> (a) where the invert of the pipe is below the existing ground level - the existing ground level except that where the Earthworks Outline is below the existing ground level the measurement shall be taken to the Earthworks Outline; (b) where the invert of the pipe is at or above the existing ground level - Earthworks Outline; |
| Itemisation | 4 | Separate items shall be provided for watermains in accordance with Chapter II paragraphs 3 and 4 and the following: |

Group	Feature
I	1 Watermains
II	1 Different internal diameters
III	1 Different types of watermain
IV	1 Depths not exceeding 2 metres. The average depth to invert to be stated to the nearest 25mm.
	2 Depths exceeding 2 metres but not exceeding 4 metres and so on in steps of 2 metres. The average depth to be stated to the nearest 25mm
V	1 Construction in trench
	2 Construction in heading
	3 Construction by jacking or thrust boring
	4 Suspended on discrete supports
VI	1 In side slopes of cuttings or side slopes of embankments

Note For each item which includes Group IV Feature 1 or 2, an associated item shall be provided for adjustment of the rate for each 25mm of difference in excess of 150mm where the average depth to invert calculated from site measurement varies from that stated in the Bill of Quantities. The forgoing

shall apply to both increases and decreases of average in excess of 150mm, and will result in either a positive or negative adjustment of the rate.

Watermains

5 The items for watermains 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) temporary trench support;
- (d) hangers, stools and discrete supports;
- (e) bedding, haunching and surrounding;
- (f) formwork (as Series 1700 paragraph 14);
- (g) warning mesh;
- (h) movement joints to beds, surrounds and the like;
- (i) backfilling and compaction;
- (j) disposal of material (as Series 600 paragraph 39);
- (k) placing and compacting pipe bedding material and surround material;
- (l) testing of water mains including provision of water testing equipment, certification;
- (m) provision, supply and transportation for all water necessary for testing, cleaning, swabbing and chlorination of water main
- (n) attendance of Water Service Authority personnel while the connections to the mains are being made;
- (o) liaison and coordination of works with Water Service Authority;
- (p) reinstatement of unpaved areas;
- (q) protective coating for pipes and fittings;
- (r) cleaning, swabbing and chlorination of water main;
- (s) surveys and recordings.

Connections

Units	6	The unit of measurement for connections shall be: (i) connection to existing watermain number.															
Measurement	7	Connections shall only be separately measured for connection to existing watermains.															
Itemisation	8	Separate items shall be provided for connections in accordance with Chapter II paragraphs 3 and 4 and the following: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Group</th> <th style="text-align: left;">Feature</th> </tr> </thead> <tbody> <tr> <td rowspan="2" style="vertical-align: top;">I</td> <td>1 Connection to existing watermain</td> </tr> <tr> <td>2 Connection to existing chamber Bends</td> </tr> <tr> <td>II</td> <td>1 Different internal diameters</td> </tr> <tr> <td>III</td> <td>1 Different types of watermain</td> </tr> <tr> <td rowspan="2" style="vertical-align: top;">IV</td> <td>1 Depths to invert not exceeding 2 metres</td> </tr> <tr> <td>2 Depths to invert exceeding 2 metres but not exceeding 4 metres and so on in steps of 2 metres At the place of fabrication or manufacture</td> </tr> <tr> <td rowspan="2" style="vertical-align: top;">V</td> <td>1 Connection to existing watermain</td> </tr> <tr> <td>2 Connection to existing chamber</td> </tr> </tbody> </table>	Group	Feature	I	1 Connection to existing watermain	2 Connection to existing chamber Bends	II	1 Different internal diameters	III	1 Different types of watermain	IV	1 Depths to invert not exceeding 2 metres	2 Depths to invert exceeding 2 metres but not exceeding 4 metres and so on in steps of 2 metres At the place of fabrication or manufacture	V	1 Connection to existing watermain	2 Connection to existing chamber
Group	Feature																
I	1 Connection to existing watermain																
	2 Connection to existing chamber Bends																
II	1 Different internal diameters																
III	1 Different types of watermain																
IV	1 Depths to invert not exceeding 2 metres																
	2 Depths to invert exceeding 2 metres but not exceeding 4 metres and so on in steps of 2 metres At the place of fabrication or manufacture																
V	1 Connection to existing watermain																
	2 Connection to existing chamber																
Connections to Existing Watermains	9	The items for connection to watermains shall in accordance with the Preambles to Bill of Quantities General Directions include for: (a) excavation of acceptable material (as Series 600 paragraphs 17 and 18); (b) excavation of unacceptable material (as Series 600 paragraph 19); (c) locating existing pipe or chamber; (d) backfilling and compaction; (e) disposal of material (as Series 600 paragraph 39); (f) making entry into chambers, concrete benching and channels, and making good the benching, channels and walls; (h) pipes, fittings and saddles; (i) bedding, haunching and surrounding material; (j) formwork (as Series 1700 paragraph 14); (k) sealing off disused ends; (l) re-laying existing watermains disturbed; (m) controlling existing flows.															
Item Coverage																	

Pipe Fittings

- Units **10** The unit of measurement shall be:
- (i) fittings number.
- Measurement **11** The measurement shall be of the complete fitting including any associated washers, nuts bolts, etc.
- Itemisation **12** Separate items shall be provided for fittings in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Bends
	2 Junctions and branches
	3 Tapers
	4 Double collars
	5 Adaptors
	6 Glands
	7 Bellmouths
	8 Straight Specials
II	1 Nominal bore : not exceeding 200mm
	2 Nominal bore : 200 – 300mm
	3 Nominal bore : 300 – 600mm
	4 Nominal bore : 600 – 900mm
	5 Nominal bore : 900 – 1200mm
	6 Nominal bore : 1200 – 1500mm
	7 Nominal bore : 1500 – 1800mm
	8 Nominal bore : exceeding 1800mm
III	1 Provided by the Employer
IV	1 At the place of fabrication or manufacture
V	1 Until completion of the Works
	2 After completion of the Works

- Pipe Fittings** **13** The items for chambers shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- Item Coverage
- (a) preparation of surfaces
- (b) installation of fittings
- (c) locating existing watermains and fittings;
- (d) cleaning;
- (e) seals;
- (f) controlling existing flows.

- (i) chambers number.
- Measurement** **19** The measurement shall be of the complete chamber.
- 20** Depths of chambers shall be the distance between the top surface of the cover and the uppermost surface of the base slab. Where no base slab is required the depth shall be taken to the bottom of the excavation.

- Itemisation** **21** Separate items shall be provided for chambers in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Chambers
II	1 Specified design groups
	2 Particular designs stated in the Contract
III	1 Depths not exceeding 1 metre
	2 Depths exceeding 1 metre but not exceeding 2 metres and so on in steps of 1 metre
IV	1 Different types of covers or gratings

Chambers

- 22** The items for chambers 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) locating existing watermains and fittings;
 - (d) construction of bases, walls, roof and cover slabs, landing slabs and hinged gratings, shafts, surrounds and corbelling for cover;
 - (e) fittings, benchings, building in pipes and watermain connections;
 - (f) cleaning;
 - (g) steps, safety chains, ladders, handholds and the like;
 - (h) covers, frames, seatings, bedding and haunching;
 - (i) cover keys;
 - (j) concrete (as Series 1700 paragraphs 4 and 9);
 - (k) formwork (as Series 1700 paragraph 14);
 - (l) reinforcement (as Series 1700 paragraph 25);
 - (m) backfilling and compaction;
 - (n) disposal of material (as Series 600 paragraph 39);
 - (o) filling;
 - (p) notices;

- (q) sealants (as Series 2300 paragraph 10);
- (r) brickwork (as Series 2400 paragraph 4);
- (s) re-laying existing watermains disturbed;
- (t) controlling existing flows;
- (u) plastering and finishes.

Thrust Blocks

- | | | |
|-------------|-----------|---|
| Units | 29 | The unit of measurement shall be: <ul style="list-style-type: none"> (i) thrust blocks number. |
| Measurement | 30 | The measurement shall be of the complete thrust block. |
| | 31 | The volumes used for classification of thrust blocks shall exclude the volumes occupied by the pipes. |
| Itemisation | 32 | Separate items shall be provided for chambers in accordance with Chapter II paragraphs 3 and 4 and the following: |

Group	Feature
I	1 Thrust Block
II	1 Volume : not exceeding 0.1m ³
	2 Volume : 0.1 – 0.2m ³
	3 Volume : 0.2 – 0.5m ³
	4 Volume : 0.5 – 1m ³
	5 Volume : 1 – 2m ³
	6 Volume : 2 – 4m ³
	7 Volume : 4 – 6m ³
	8 Volume : stated exceeding 6m ³

- | | | |
|-----------------|-----------|---|
| Chambers | 33 | The items for chambers shall in accordance with the Preambles to Bill of Quantities General Directions include for: <ul style="list-style-type: none"> (a) excavation of acceptable material (as Series 600 paragraphs 17 and 18); (b) excavation of unacceptable material (as Series 600 paragraph 19); (c) locating existing watermains and fittings; (d) construction of thrust block; (e) fittings, benchings, building in pipes and any pipe fixings required; (f) concrete (as Series 1700 paragraphs 4 and 9); (g) formwork (as Series 1700 paragraph 14); (h) reinforcement (as Series 1700 paragraph 25); (i) backfilling and compaction; |
| Item Coverage | | |

- (j) disposal of material (as Series 600 paragraph 39);
- (k) filling;
- (l) keeping excavations free from water.

Utilities (other than Watermains) and Accommodation Works

The method of measurement for Works for the owners of utilities (other than Watermains) and accommodation works shall be in accordance with the various Series of this Method of Measurement.



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