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Requirements for Measuring and Pricing of Watermains, Utilities and Accommodation Works

CC-RMP-02700

October 2016

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TII Publications



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1. Watermains, Utilities and Accommodation Works

Watermains

Units	1	The units of measurement shall be: (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: (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 Section 3 of CC-RMP-00010, paragraphs 3 and 4 and the following: <table border="0" style="margin-left: 20px;"> <thead> <tr> <th style="text-align: left;">Group</th> <th style="text-align: left;">Feature</th> </tr> </thead> <tbody> <tr> <td>I</td> <td>1 Watermains</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>IV</td> <td>1 Depths not exceeding 2 metres. The average depth to invert to be stated to the nearest 25mm.</td> </tr> <tr> <td></td> <td>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</td> </tr> <tr> <td>V</td> <td>1 Construction in trench</td> </tr> <tr> <td></td> <td>2 Construction in heading</td> </tr> <tr> <td></td> <td>3 Construction by jacking or thrust boring</td> </tr> <tr> <td></td> <td>4 Suspended on discrete supports</td> </tr> <tr> <td>VI</td> <td>1 In side slopes of cuttings or side slopes of embankments</td> </tr> </tbody> </table> <p>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.</p>	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
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	4 Suspended on discrete supports																							
VI	1 In side slopes of cuttings or side slopes of embankments																							
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 (CC-RMP-00600 paragraphs 17 and 18); (b) excavation of unacceptable material (CC-RMP-00600 paragraph 19); (c) temporary trench support;																						

- (d) hangers, stools and discrete supports;
- (e) bedding, haunching and surrounding;
- (f) formwork (CC-RMP-01700 paragraph 14);
- (g) warning mesh;
- (h) movement joints to beds, surrounds and the like;
- (i) backfilling and compaction;
- (j) disposal of material (CC-RMP-00600 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 Section 3 of CC-RMP-00010, paragraphs 3 and 4 and the following:

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:

Item Coverage

- (a) excavation of acceptable material (CC-RMP-00600 paragraphs 17 and 18);

- (b) excavation of unacceptable material (CC-RMP-00600 paragraph 19);
- (c) locating existing pipe or chamber;
- (d) backfilling and compaction;
- (e) disposal of material (CC-RMP-00600 paragraph 39);
- (f) making entry into chambers, concrete benching and channels, and making good the benching, channels and walls;
- (g) pipes, fittings and saddles;
- (h) bedding, haunching and surrounding material;
- (i) formwork (CC-RMP-01700 paragraph 14);
- (j) sealing off disused ends;
- (k) re-laying existing watermains disturbed;
- (l) controlling existing flows.

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 Section 3 of CC-RMP-00010, paragraphs 3 and 4 and the following: <table border="0" style="margin-left: 20px;"> <thead> <tr> <th style="text-align: left;">Group</th> <th style="text-align: left;">Feature</th> </tr> </thead> <tbody> <tr> <td rowspan="8">I</td> <td>1 Bends</td> </tr> <tr> <td>2 Junctions and branches</td> </tr> <tr> <td>3 Tapers</td> </tr> <tr> <td>4 Double collars</td> </tr> <tr> <td>5 Adaptors</td> </tr> <tr> <td>6 Glands</td> </tr> <tr> <td>7 Bellmouths</td> </tr> <tr> <td>8 Straight Specials</td> </tr> <tr> <td rowspan="8">II</td> <td>1 Nominal bore : not exceeding 200mm</td> </tr> <tr> <td>2 Nominal bore : 200 – 300mm</td> </tr> <tr> <td>3 Nominal bore : 300 – 600mm</td> </tr> <tr> <td>4 Nominal bore : 600 – 900mm</td> </tr> <tr> <td>5 Nominal bore : 900 – 1200mm</td> </tr> <tr> <td>6 Nominal bore : 1200 – 1500mm</td> </tr> <tr> <td>7 Nominal bore : 1500 – 1800mm</td> </tr> <tr> <td>8 Nominal bore : exceeding 1800mm</td> </tr> <tr> <td>III</td> <td>1 Provided by the Employer</td> </tr> <tr> <td>IV</td> <td>1 At the place of fabrication or manufacture</td> </tr> <tr> <td rowspan="2">V</td> <td>1 Until completion of the Works</td> </tr> <tr> <td>2 After completion of the Works</td> </tr> </tbody> </table>	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
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	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.

Valves and Penstocks

Units

14 The unit of measurement shall be:

- (i) Valves and penstocks number.

Measurement

15 The measurement shall be of the complete valve including any associated washers, nuts, bolts etc.

Itemisation

16 Separate items shall be provided for valves and penstocks in accordance with Section 3 of CC-RMP-00010, paragraphs 3 and 4 and the following:

Group	Feature
I	1 Pipe material
II	1 Bends
	2 Gate valves – hand operated
	3 Gate valves – power operated
	4 Non-return valves
	5 Butterfly valves – hand operated
	6 Butterfly valves – power operated
	7 Air valves
	8 Pressure reducing valve
III	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
IV	1 Fittings without puddle flanges
	2 Fittings with puddle flanges

Valves and Penstocks

17 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 valves
- (c) locating existing watermains and fittings;
- (d) cleaning;
- (e) seals;
- (f) controlling existing flows.

Chambers

- Units** **18** The unit of measurement shall be:
- (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 Section 3 of CC-RMP-00010, 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 (CC-RMP-00600 paragraphs 17 and 18);
 - (b) excavation of unacceptable material (CC-RMP-00600 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, benching, building in pipes and watermain connections;
 - (f) cleaning;
 - (g) steps, safety chains, ladders, handholds and the like;
 - (h) covers, frames, seating, bedding and haunching;
 - (i) cover keys;
 - (j) concrete (CC-RMP-01700 paragraphs 4 and 9);
 - (k) formwork (CC-RMP-01700 paragraph 14);
 - (l) reinforcement (CC-RMP-01700 paragraph 25);
 - (m) backfilling and compaction;
 - (n) disposal of material (CC-RMP-00600 paragraph 39);
 - (o) filling;
 - (p) notices;
 - (q) sealants (CC-RMP-02300 paragraph 10);
 - (r) brickwork (CC-RMP-02400 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:
- (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 Section 3 of CC-RMP-00010, 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 _[GM1] [AC2] |
| | 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:
- Item Coverage**
- (a) excavation of acceptable material (CC-RMP-00600 paragraphs 17 and 18);
 - (b) excavation of unacceptable material (CC-RMP-00600 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 (CC-RMP-01700 paragraphs 4 and 9);
 - (g) formwork (CC-RMP-01700 paragraph 14);
 - (h) reinforcement (CC-RMP-01700 paragraph 25);
 - (i) backfilling and compaction;
 - (j) disposal of material (CC-RMP-00600 paragraph 39);
 - (k) filling;
- 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 document of this Method of Measurement.

2. References


2.1 TII Publications (Standards) References

CC-RMP-00010	Introduction to the Requirements for Measuring and Pricing
CC-RMP-00600	Requirements for Measuring and Pricing of Earthworks
CC-RMP-01700	Requirements for Measuring and Pricing of Structural Concrete
CC-RMP-02300	Requirements for Measuring and Pricing of Bridge Expansion Joints and Sealing of Gaps
CC-RMP-02400	Requirements for Measuring and Pricing of Brickwork, Blockwork and Stonework




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