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Indian Standard

**METHODS OF MEASUREMENT OF
BUILDING AND CIVIL ENGINEERING WORKS**

**PART XVI LAYING OF WATER AND SEWER LINES
INCLUDING APPURTENANT ITEMS**

(Third Revision)

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

*Indian Standard***METHOD OF MEASUREMENT OF
BUILDING AND CIVIL ENGINEERING WORKS****PART XVI LAYING OF WATER AND SEWER LINES
INCLUDING APPURTENANT ITEMS***(Third Revision)*

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Indian Standard

METHOD OF MEASUREMENT OF BUILDING AND CIVIL ENGINEERING WORKS

PART XVI LAYING OF WATER AND SEWER LINES INCLUDING APPURTENANT ITEMS

(Third Revision)

0. FOREWORD

0.1 This Indian Standard (Part XVI) (Third Revision) was adopted by the Indian Standards Institution on 31 May 1979, after the draft finalized by the Civil Works Measurement Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Measurement occupies a very important place in the planning and execution of any civil engineering work, from the time of first estimates to the final completion and settlement of payments. The methods being followed for the measurement are not uniform, and considerable differences exist between the practices followed by different construction agencies and also between various Central and State Government Departments. While it is recognized that each system of measurement has to be specifically related to the administrative and financial organisation with the departments responsible for the work, a unification of the various systems at the technical level has been accepted as very desirable, specially as it permits a wider circle of operation for civil engineering contractors and eliminates ambiguities and misunderstandings arising out of inadequate understanding of the various systems followed.

0.3 Among the various civil engineering items, measurement of building had been the first to be taken up for standardization and this standard having provisions relating to building works, was first published in 1958 and was revised in 1964.

0.4 In the course of usage of this standard by various construction agencies in the country, several clarifications and suggestions for modifications were received and as a result of study, the technical committee responsible for this standard decided that scope of this standard besides being applicable to building should be expanded so as to cover method of measurement applicable to civil engineering works like industrial and river valley project works.

0.5 Since measurement of each type of trade is not related to one another, and also, to facilitate the second revision of IS:1200-1964*, the Sectional Committee decided that each type of trade as given in IS:1200-1964* be issued separately as different parts. This will also be helpful to the specific users in various trades in using the standard. This part covering the method of measurement of laying of water and sewer lines including appurtenant items applicable to building as well as civil engineering works was therefore issued as a second revision 1969. The third revision has been taken up so as to keep the provisions conform to the latest practice.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of the measurement, shall be rounded off in accordance with IS:2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part XVI) covers the method of measurement of laying of water and sewer lines; and other appurtenant items of work, involved in the execution of water supply and sewerage projects.

NOTE — The method of measurement of water supply, plumbing and drains is covered in IS:1200 (Part XIX)-1970‡.

2. GENERAL RULES

2.1 Clubbing of Items — Items may be clubbed together, provided these are on the basis of detailed description of items as stated in the standard.

2.2 Booking of Dimensions — In booking dimensions, the order shall be consistent in the sequence of length, breadth or width, and height or depth or thickness.

2.3 Description of Items — The description of each item shall, unless otherwise stated, be held to include wherever necessary conveyance and delivery, handling, unloading, storing, fabrication, hoisting, all labour for finishing to the required shape and size, setting, fitting and fixing in position, straight cutting and waste, and other incidental operations.

2.4 Dimensions — All work shall be measured net as fixed, to the nearest 0.01 metre, unless otherwise stated hereinafter.

2.5 Bills of Quantities — Items of work shall fully describe the materials and workmanship, and accurately represent the work to be executed.

*Method of measurement of building works (revised).

†Rules for rounding off numerical values (revised).

‡Method of measurement of building works: Part XIX Water supply, plumbing, drains and sanitary fittings.

2.6 Work to be Measured Separately — Work executed in the following conditions shall be measured separately.

- a) Work in or under water,
- b) Work in liquid mud,
- c) Work in or under foul positions,
- d) Work interrupted by tides.

2.6.1 The levels of high and low water tides, where occurring, shall be stated.

2.6.2 Where special pumping, due to causes other than rains, and sub-soil water, is resorted to, the same shall be measured separately, unless otherwise stated, in kilolitres of water against a separate specific provision(s) made for this purpose [see 2.7 of IS: 1200 (Part I)-1974*].

2.7 Measurement in Stages — Work shall be measured under the following categories in convenient stages stating the height or depth.

- a) Below ground/datum line, and
- b) Above ground/datum line.

NOTE — Ground/datum line shall be specified in each case.

2.8 Excavation and Earthwork — Method of measurement for excavation and earthwork for laying pipelines and other allied works shall be as given in IS: 1200 (Part I)-1974*.

2.9 Bed, Benching and Covering — Method of measurement for beds, benchings and covering shall be as given in similar item in IS:1200 (Part II)-1974†.

3. METHOD OF MEASUREMENT OF WATER LINES

3.1 Pipes shall be classified according to their diameter, length of each pipe, kind of material, the quality of pipe and the method of jointing, and shall be measured in running metres inclusive of all joints. The measurement shall be taken along the central line of the pipes and fittings or specials. All fittings or specials shall be enumerated separately as extra over the pipes. Cutting and jointing the pipes to such fittings or specials shall be deemed to be included with the item of fittings or specials.

3.1.1 Alternatively, pipes shall be classified according to their diameter, kind of material quality of the pipe and shall be measured in running metres. The measurement shall be taken along the central line of the pipes and in between the fittings or specials. All joints, fittings or specials shall be fully described and enumerated separately. Cutting of pipes for jointing to such fittings or specials shall be deemed to be included with the item of fittings or specials.

*Method of measurement of building and civil engineering works: Part I Earthwork (*third revision*).

†Method of measurement of building and civil engineering works: Part II Concrete work (*third revision*).

3.2 Suspended pipes and vertical pipes shall be so described and the supports and other fixing arrangement (see 3.4.2) measured separately.

3.3 Testing — The measurement for testing of the pipelines shall be in running metres, unless otherwise stated.

3.4 Miscellaneous Works

3.4.1 The valve cistern, public fountain platforms, fire hydrants, etc, shall be fully described and enumerated.

3.4.2 All other miscellaneous works, such as supports like hangers, pillars, crossing of railway lines and culverts, cutting and reconditioning of pavements, deviation of pipelines and cables, dismantling and reconstruction of masonry works shall be measured as recommended in relevant Indian Standards.

4. METHOD OF MEASUREMENT OF SEWER LINES

4.1 Sewer lines shall be classified according to their diameter, length of each pipe, kind of material, the quality of pipe and the method of jointing, and shall be measured in running metres inclusive of all joints. The measurement shall be taken along the central line of the sewers and fittings or specials. All fittings or specials shall be enumerated separately as 'extra-over' the sewers. Cutting and jointing the sewers to such fittings or specials shall be deemed to be included with the item of fittings or specials.

4.1.1 Alternatively, sewers shall be classified according to their diameter, kind of material, quality of the pipe and shall be measured in running metres. The measurement shall be taken along the central line of the sewers and in between the fittings or specials. All joints, fittings or specials shall be fully described and enumerated separately. Cutting and jointing of sewers to such fittings or specials shall be deemed to be included with the item of fittings or specials.

4.2 Manholes — The manholes and the inspection chambers shall be measured in detail as recommended in relevant Indian Standards.

4.2.1 Alternatively, the manholes and inspection chambers shall be described and enumerated. They shall be classified into different groups depending upon the depth, such as, up to half metre depth, half to one, one to two, two to three and so on. The depth of the manhole shall be the distance between the top of the manhole cover and the invert of the main drain.

4.3 Appurtenant Items

4.3.1 Ventilating shafts, pumping mains and other appurtenant items of work shall be described and enumerated. Alternatively, these items shall be measured in detail as recommended in relevant Indian Standard.

4.3.2 For all other miscellaneous items of work, the method given in **3.4.2** may be followed.

4.4 Testing — Measurement for testing of sewers shall be in running metres between manholes.

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