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*Indian Standard*

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

**PART XIX WATER SUPPLY, PLUMBING AND DRAINS**

**( *Third Revision* )**

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**BUREAU OF INDIAN STANDARDS  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002**

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AND CIVIL ENGINEERING WORKS

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# *Indian Standard*

## METHOD OF MEASUREMENT OF BUILDING AND CIVIL ENGINEERING WORKS

### PART XIX WATER SUPPLY, PLUMBING AND DRAINS

### *( Third Revision )*

#### 0. FOREWORD

**0.1** This Indian Standard ( Part XIX ) ( Third Revision ) was adopted by the Indian Standards Institution on 27 February 1981, 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 by 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 organization 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 the 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 one type of trade is not related to that of another one, 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 standard covering the method of measurement of water supply, plumbing and drains applicable to buildings as well as civil engineering works was therefore issued as the second revision in 1970. This third revision has been prepared so as to keep the provisions in line with method of measurement now followed by majority of organizations.

**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 a test or analysis, 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.

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## **1. SCOPE**

**1.1** This standard ( Part XIX ) covers the method of measurement of water supply, plumbing and drains in buildings and civil engineering works.

**NOTE** — The method of measurement of laying of water and sewer lines, etc, is covered in IS : 1200 ( Part XVI ) - 1979‡.

## **2. GENERAL RULES**

**2.1 Clubbing of Items** — Items may be clubbed together provided the breakup of the clubbed items is agreed to be on the basis of the detailed description of the items.

**2.2 Booking of Dimensions** — In booking dimensions, the order shall be consistent and generally 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, loading, unloading, storing, fabrication, hoisting, all labour for finishing to required shape and size, setting, fitting and fixing in position, straight cutting and waste, return of packings, and other incidental operations.

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\*Method of measurement of buildings works ( *revised* ).

†Rules for rounding off numerical values ( *revised* ).

‡Method of measurement of building and civil engineering works: Part XVI Laying of water and sewer lines including appurtenant items ( *third revision* ).

**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.

**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, and
- 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 subsoil 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 — The ground/datum line shall be specified in each case.

### 3. GENERAL

**3.1** All pipes and fittings shall be classified according to their nominal diameter, kind of material, quality and the method of jointing and shall be measured in running metres unless otherwise specified. The method of laying, jointing and fixing shall be fully described.

NOTE — The nominal diameter is as defined in relevant Indian Standard.

**3.1.1** The item shall include all cutting and waste of pipes and also cutting threads where necessary.

**3.2** In the case of fittings of unequal diameter, it shall be designated by largest diameter.

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

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**3.3** The testing of water supply, drains and plumbing shall be included in the description of the item.

**3.4** Lead caulked joints shall be enumerated separately.

**3.5** Pipes laid or fixed in ducts, chases, trenches, embedded in floor, fixed to walls, ceilings, etc, with supports shall be measured separately.

**3.6** The method of measurement for excavation of trenches for laying pipelines and other allied works and refilling of the trenches, etc, shall be as per IS : 1200 ( Part I )-1974\*.

**3.7** Concrete beds, haunchings and coverings, including any form-work required, shall be described and measured in running metres stating size of the pipe, dimensions and mix of concrete.

**3.8** Cutting through walls, floors, etc, and making good shall be included with the item. This shall, however, not include concealed pipe work in which case the cutting of chase and making good shall be measured separately in running metres.

**3.9** Lengths of pipes not exceeding one metre, other than running lengths, shall be measured separately in running metres and described as in short length.

### **4. WATER SUPPLY**

**4.0** Standard fittings like elbows, bends, tees, connectors, unions, diminishing sockets shall be included along with the pipes.

**4.1** Caps, collers, plugs, stopped ends and similar items of the pipe shall be described and enumerated.

**4.2** Sluice valves, hydrants, stop-cocks, covers, surface boxes and water meters shall be described and enumerated and shall be measured separately according to the diameter. The jointing to pipe on either side shall be described.

**4.3** The connection to the water main shall be described and enumerated.

**4.4 Boilers, Cisterns and Cylinders** — Boilers, cisterns and cylinders shall be enumerated stating the type, size, location, method of fixing, working and test pressure and the type and size of the connections for pipes. Perforations for connections shall be enumerated.

**4.4.1 Insulating Coverings to Boilers, Pipes, etc** — Insulating coverings shall be fully described and measured in square metres in the case of

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

boilers, cylinders and tanks and in running metres in the case of pipes stating the diameter. No deduction shall be made for manholes, hands, holes, pipes, etc, passing through insulation, nor shall any extra be measured for finishing insulations around such openings.

**4.4.2** Insulation to bends, elbows, tees, valves and the like shall be enumerated as extra over.

## **5. PLUMBING**

**5.1 Plumber's Work** — Locks, taps, valves, pillar-cock, stop-cock, ball valves, caps and linings, also cleaning eyes with screw caps, ferrules, thimbles, unions, waste washers, perforated gratings and the like shall be described and enumerated. The joints and the fixing shall also be described and included in the item.

**5.2** Bends, elbows, tees, branches, inspection or access doors, swan necks, enlarged sockets, etc, for soil waste and bent pipes shall be enumerated as extra over.

**5.2.1** Wire guards and ventilating cowls over tops of pipes shall be described and enumerated and measured separately according to the bore of the pipe.

**5.2.2** Stack clamps shall be described and enumerated stating the length of stay and the method of fixing to wall or roof.

**5.3** Brass pipes shall be classified according to their external diameter and thickness of metal. The description shall state the method of jointing and fixing.

**5.3.1** Standard fittings like elbows, bends, tees, connectors, unions and diminishing sockets shall be enumerated.

**5.4** Traps shall be described and enumerated. Joints at both ends shall be included in the item.

**5.5** Water closets, washdown type/squatting type/siphonic washdown type wash basins, laboratory sinks, urinals, bowl type/half stall type/squatting plate type partition slabs, siphonic toilets, foot rests, shower roses, traps for squatting pans, universal water closets, flushing cisterns for urinals, automatic type, flushing cisterns for water closets and urinals, siphonic type, brackets and supports, bath tubs, cast iron gratings for drainage purposes, mixing valves, water closets, seats, self-closing taps, kitchen sinks, water spreaders for urinals, half round channels, foot rests, traps for squatting pans, waste fittings for wash basins and sinks, waste plugs and accessories for sinks and wash basins and other similar fittings together with fixing of the same shall be enumerated and fully described.



## **6. DRAIN**

**6.1 Drain Pipes** — The pipes shall be classified according to their nominal diameter, the quality of pipe, kind of material 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.

**6.1.1** Alternatively, the pipes shall be classified according to the nominal diameter, quality, kind of material 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 described and enumerated separately. Cutting of pipes for jointing to such fittings or specials shall be deemed to be included with the item of fitting or specials.

**6.2** The manholes and inspection chambers shall be measured in detail as per relevant parts of this Indian Standard.

**6.2.1** 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.

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