

इंटरनेट

मानक

### Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 1200-16 (1979): Method of measurement of building and civil engineering works, Part 16: laying of water and sewer lines including appurtenant items [CED 44: Methods of Measurement of Works of Civil Engineering]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartḥari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



BLANK PAGE



IS : 1200 ( Part XVI ) - 1979  
( Reaffirmed 1992 )

*Indian Standard*

METHODS OF MEASUREMENT OF  
BUILDING AND CIVIL ENGINEERING WORKS

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

*( Third Revision )*

Fourth Reprint FEBRUARY 1998

UDC 69.003.12 : 696.1

© *Copyright* 1979

**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
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 )*

Civil Works Measurements Sectional Committee, BDC 44

*Chairman*

SHRI S. R. NAIR

*Representing*

Engineer-in-Chief's Branch, Army Headquarters

*Members*

SHRI K. D. ARCOT	Engineers India Limited, New Delhi
SHRI T. V. SITARAM ( <i>Alternate</i> )	
SHRI S. K. CHAKRABORTY	Commissioner for the Port of Calcutta, Calcutta
CHIEF ENGINEER ( R & B )	Public Works Department, Government of Haryana
SUPERINTENDING ENGINEER ( P & D ) ( <i>Alternate</i> )	
DIRECTOR	Irrigation Research Institute, Roorkee
DIRECTOR ( R & C )	Central Water Commission, New Delhi
DEPUTY DIRECTOR ( R & C ) ( <i>Alternate</i> )	
SHRI P. N. GADI	Institution of Surveyors, New Delhi
SHRI P. L. BHASIN ( <i>Alternate</i> )	
SHRI G. K. C. IYENGAR	Heavy Engineering Corporation Ltd, Ranchi
SHRI M. L. JAIN	National Industrial Development Corporation Ltd, New Delhi
SHRI K. K. KHANNA	National Buildings Organization, New Delhi
SHRI A. K. LAL ( <i>Alternate</i> )	
SHRI S. K. LAHA	Institution of Engineers ( India ), Calcutta
SHRI V. D. LONDHE	Concrete Association of India, Bombay
SHRI N. C. DUGGAL ( <i>Alternate</i> )	
SHRI K. K. MADHOK	Builders' Association of India, Bombay
SHRI DATTA S. MALIK	Indian Institute of Architects, Bombay
PROF M. K. GODBOLE ( <i>Alternate</i> )	
SHRI B. S. MATHUR	Roads Wing ( Ministry of Shipping & Transport )
SHRI A. D. NARAIN ( <i>Alternate</i> )	
SHRI R. S. MOORTHY	Gammon India Ltd, Bombay
SHRI H. D. MATANGE ( <i>Alternate</i> )	

*( Continued on page 2 )*

© Copyright 1979

BUREAU OF INDIAN STANDARDS

This publication is protected under the *Indian Copyright Act* ( XIV of 1957 ) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

( Continued from page 1 )

<i>Members</i>	<i>Representing</i>
SHRI C. B. PATEL	M. N. Dastur & Co Private Ltd, Calcutta
SHRI B. C. PATEL ( <i>Alternate</i> )	
SHRI V. G. PATWARDHAN	Engineer-in-Chief's Branch, Army Headquarters
SHRI G. G. KARMARKAR ( <i>Alternate</i> )	
SHRI RADHEY SHIAM	Hindustan Steelworks Construction Ltd, Calcutta
SHRI P. S. HARI RAO	Hindustan Construction Co Ltd, Bombay
SHRI N. M. DASTANE ( <i>Alternate</i> )	
SHRI K. K. SACHDEV	Hindustan Prefab Factory Ltd, New Delhi
SHRI G. B. SINGH ( <i>Alternate</i> )	
SHRI P. B. SATHE	Public Works & Housing Department, Government of Maharashtra
SENIOR CIVIL ENGINEER ( P & D ), NR	Railway Board ( Ministry of Railways )
SHRI B. K. SHAH	Bombay Port Trust, Bombay
DR R. B. SINGH	Banaras Hindu University, Varanasi
SHRI S. SRINIVASAN	Hindustan Steel Ltd, Ranchi
SUPERINTENDING ENGINEER, MANAK CANAL CIRCLE	Irrigation Department, Government of Haryana
SUPERINTENDING ENGINEER ( JLN CIRCLE No. 1 ) ( <i>Alternate</i> )	
SUPERINTENDING SURVEYOR OF WORKS ( AVI )	Central Public Works Department, New Delhi
SURVEYOR OF WORKS ( I ) ( AVI ) ( <i>Alternate</i> )	
SHRI J. C. VERMA	Bhakra Management Board, Nangal Township
SHRI I. P. PURI ( <i>Alternate</i> )	
SHRI D. AJITHA SIMHA, Director ( Civ Engg )	Director General, ISI ( <i>Ex-officio Member</i> )

*Secretary*

SHRI K. M. MATHUR  
Deputy Director ( Civ Engg ), BIS

# *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.

# BUREAU OF INDIAN STANDARDS

## Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002  
Telephones: 323 0131, 323 3375, 323 9402  
Fax : 91 11 3234062, 91 11 3239399, 91 11 3239382

Telegrams : Manaksanstha  
(Common to all Offices)

## Central Laboratory:

Plot No. 20/9, Site IV, Sahibabad Industrial Area, SAHIBABAD 201010 Telephone 8-77 00 32

## Regional Offices:

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002 323 76 17  
\*Eastern : 1/14 CIT Scheme VII M, V.I.P. Road, Maniktola, CALCUTTA 700054 337 86 62  
Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022 60 38 43  
Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113 235 23 15  
†Western : Manakalaya, E9 Behind Marol Telephone Exchange, Andheri (East), 832 92 95  
MUMBAI 400093

## Branch Offices:

'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMEDABAD 380001 550 13 48  
‡Peenya Industrial Area, 1st Stage, Bangalore - Tumkur Road, 839 49 55  
BANGALORE 560058  
Gangotri Complex, 5th Floor, Bhadbhada Road, T. T. Nagar, BHOPAL 462003 55 40 21  
Plot No. 62-63. Unit VI. Ganga Nagar, BHUBANESHWAR 751001 40 36 27  
Kalaikathir Buildings, 670 Avinashi Road, COIMBATORE 641037 21 01 41  
Plot No. 43, Sector 16 A, Mathura Road, FARIDABAD 121001 8-28 88 01  
Savitri Complex, 116 G. T. Road, GHAZIABAD 201001 8-71 19 96  
53/5 Ward No. 29, R. G. Barua Road, 5th By-lane, GUWAHATI 781003 54 11 37  
5-8-58C, L. N. Gupta Marg, Nampally Station Road, HYDERABAD 500001 20 10 83  
E-52, Chitaranjan Marg, C-Scheme, JAIPUR 302001 37 29 25  
117/418 B, Sarvodaya Nagar, KANPUR 208005 21 68 76  
Seth Bhawan, 2nd Floor, Behind Leela Cinema, Naval Kishore Road, 23 89 23  
LUCKNOW 226001  
Patliputra Industrial Estate, PATNA 800013 26 23 05  
T. C. No. 14/1421, University P. O. Palayam, 6 21 17  
THIRUVANANTHAPURAM 695034  
NIT Building, Second Floor, Gokulpat Market, NAGPUR 440010 52 51 71  
Institution of Engineers ( India ) Building, 1332 Shivaji Nagar, PUNE 411005 32 36 35

\*Sales Office is at 5 Chowringhee Approach, P. O. Princep Street, CALCUTTA 700072 27 10 85  
†Sales Office is at Novelty Chambers, Grant Road, MUMBAI 400007 309 65 28  
‡Sales Office is at 'F' Block, Unity Building, Narashimaraja Square, 222 39 71  
BANGALORE 560002