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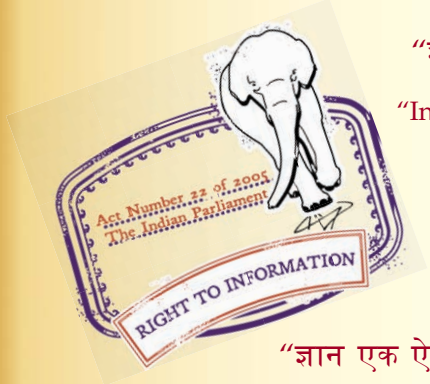
IS 1200-23 (1988): Method of measurement of building and civil engineering works, Part 23: piling [CED 44: Methods of Measurement of Works of Civil Engineering]



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"Knowledge is such a treasure which cannot be stolen"

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(Reaffirmed 2002)

Indian Standard

METHOD OF MEASUREMENT OF BUILDING AND CIVIL ENGINEERING WORKS

PART 23 PILING

(Fourth Revision)

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

Gr 3

March 1989

Indian Standard

METHOD OF MEASUREMENT OF BUILDING AND CIVIL ENGINEERING WORKS

PART 23 PILING

(Fourth Revision)

0. FOREWORD

0.1 This Indian Standard (Part 23) (Fourth Revision) was adopted by the Bureau of Indian Standards on 16 November 1988, after the draft finalized by the Method of Measurement of Works of Civil Engineering (Excluding River Valley Projects) 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 of project. Methods followed for measurement are not uniform and considerable differences exist between 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 administrative and financial organizations within a department responsible for the work, a unification of the various systems at technical level has been accepted as very desirable specially as it permits a wider range of operation for civil engineering contractors and eliminates ambiguities and misunderstandings arising out of inadequate understanding of the various systems followed.

0.3 Since different trades are not related to one another, the Sectional Committee during its second revision decided that each trade as given in IS : 1200-1964* shall be issued separately as a different part as it would be helpful to users in using the specific standard. This part covers the method of measurement of piling work applicable to buildings as well as to civil engineering works was published separately in the year 1971 and further revised in 1977. In view of the large number of comments received on this part, the Sectional Committee decided to issue a fourth revision incorporating the changes to keep the latest method as being followed by most of the organizations. The principal modifications are in respect of reinforced cement concrete sheet, timber sheet, and bored piles.

0.4 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 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.

*Method of measurement of building and civil engineering works *(first revision)*.

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

1. SCOPE

1.1 This standard (Part 23) covers the method of measurement of piling.

2. GENERAL RULES

2.1 Clubbing of Items — Items may be clubbed together and that the break-up of the clubbed items is agreed to be on the basis of detailed description of the items stated in this standard.

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

2.3 Description of Items — The description of each item shall unless otherwise stated, be held to include where necessary, conveyance and delivery, handling, 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, etc.

2.4 Measurements — All work shall be measured net in decimal system as fixed in its

place as given below:

a) Linear dimensions shall be measured to the nearest 0·01 m,

b) Areas shall be worked out to the nearest 0·01 m^2, and

c) Cubic contents shall be worked to the nearest 0·01 m^3.

2.5 Work to be Measured Separately — The situations, such as, in/under water, liquid mud, marshy land, tidal condition, etc, in which work is to be executed shall be stated.

2.5.1 The level of high and low water tides where occurring, shall be stated.

2.6 Bills of Quantities — The bills of quantities shall fully describe the materials and workmanship, and accurately represent the work to be executed.

2.7 A general description of the nature of site shall be stated.

2.8 The available information as to the strata through which the piles are to be driven shall be stated or reference showing records of bores be given.

2.9 If piles are to be provided from any level other than the ground level, it shall be stated. If the piling frame is to be lowered or raised, the exact height and nature of working shall be described, separate items shall be provided for driving raker/in groups/isolated/lengthened/ trial piles.

2.10 Items shall include any extra excavation filling and/or ramming required at the time of construction for the movement of piling frame for executing piling work.

2.11 Bringing plant to the site and erecting it and dismantling and taking it back, shall be measured separately as lump sum items.

NOTE — Shifting of plant at site of work shall be included in the item of piles.

2.12 If load testing is to be done, the provision for such test shall be specified and measured separately.

3. METHOD OF MEASUREMENT OF PRECAST REINFORCED CONCRETE PILES

3.1 The precast reinforced concrete piles shall be described according to the grade of concrete, section and length, the extra strength of the heads being stated. Any requisite mould shall be included in the description as also the necessary strapping, bolts and lifting holes.

3.2 The cement concrete in piles shall be measured in cubic metres, arrived at by multiplying the cross-sectional area of the pile by the length of the pile as cast from the head of the pile to the tip of shoes.

3.3 No deduction shall be made for chamfers, tapered points or the volume of reinforcement or holes for lifting piles.

3.4 The formwork, links and sleeves shall be included in the description of the item.

3.5 The reinforcement shall be measured separately [*see* IS : 1200 (Part 8)-1975*].

3.6 The shoes for each size shall be enumerated separately, stating the approximate weight.

3.7 Driving piles to a given level and redriving of lengthened piles shall be measured in running metres, separate measurements being made for piles of 5 m length and less and subsequently for every 1 m length range. The driving of piles shall be measured from the tip of the shoes up to the level as shown in the drawings. The raker piles shall be measured along the axis of the pile.

3.8 The measurement of handling, transportation and pitching of piles shall be enumerated for each occasion.

3.9 For stripping the heads of the piles, the length to be stripped shall be stated and measured per linear metre.

3.10 Stripping off the head of the piles for bond length shall be enumerated.

3.11 When concrete piles are lengthened in position, after they have been lowered, the cement concrete when used for lengthening shall be measured as a separate item. This item shall include the extra labour involved in stripping the exposed end to form connection of new with old work and any excavation, if required.

4. METHOD OF MEASUREMENT OF TIMBER PILES

4.1 Timber piles shall be described and measured in running metre stating the species of timber [*see* IS : 2911 (Part 2)-1980†] and size of the pile. If over 5·0 m in length, the length extra over 5 m shall be measured in stages of one metre.

*Method of measurement of building and civil engineering works: Part 8 Steel-work and ironwork (*third revision*).

†Code of practice for design and construction of pile foundations: Part 2 Timber piles (*first revision*).

4.1.1 The diameter of the pile shall be arrived at by measuring girth at two metres below the large end of the pile. Any tolerance on the cross-sectional dimensions of timber in permitting above or below those shown in drawings shall be specified.

4.1.2 Shaping and shoeing of pile shall be enumerated, stating the approximate weight of the shoe and size of the pile.

4.2 Handling, transportation and pitching of piles shall be enumerated for each occasion.

4.3 Driving timber piles shall be measured from the tip of the shoe to the ground level as shown in the drawings or as found at site at the time of driving. The method of measurement of driving pile shall be the same as given in **3.7**. This item shall also include cutting the top of the pile and dressing it for fixing mild steel ring against splitting during driving.

4.4 The supply and fixing of iron rings to the pile head before driving and also the labour involved in cutting off the ringed portion or any portion damaged in driving shall be included in the description of the item.

4.5 Joints in piles shall be described and enumerated.

5. METHOD OF MEASUREMENT OF STEEL SHEET PILES (PERMANENT)

5.1 Supply only of sheet piles shall be measured by weight [*see* IS : 1200 (Part 8)-1975*]. The description of the item shall include the cross-sectional shape, nomenclature of manufacture, specification of material, details of fabrication, such as, lengthening by means of welding; riveting, drilling or burning holes, joining or fixing of structural rolled steel sections, handling and transportation to the site, etc. Piles exceeding 12 m in length shall be described separately stating the lengths in further stages of 3 m.

5.2 All struts, anchor bolts, anchor plates, turn buckles, walling, etc, shall be measured separately in accordance with IS : 1200 (Part 8)-1975*.

5.3 When sheet piles are to be painted prior to driving, such painting shall be measured in square metres obtained by multiplying the length by the perimeter of the fabricated sheet pile measured along the profile. Description of the item shall include the method of preparation of surface, number of coats, mode of painting and the like.

5.4 Lifting, handling, pitching, engaging through interlocks or clutches of an adjacent sheet piles and driving shall be measured separately for each type in square metres obtained by multiplying the length of the embedded portion of the pile in soil and half of the perimeter as defined in IS : 2314-1986*. The length of the embedded portion shall be obtained by measuring from the level of the ground where the tip of the sheet pile first touches before driving, to the ultimate level of the tip of the piles after driving.

5.5 Wherever sheet piles are to be driven under/ in water necessitating the use of special hammers and/or loader frames, such piles shall be described and measured separately.

5.6 Driving corner piles and junction piles shall be measured in running metres representing the length of embedment.

5.7 Cutting or burning through steel piles shall be measured in running metres as extra over the pile. The disposal of cut length shall be described.

5.8 Extraction of piles other than those described in **5.6** shall be measured separately in square metres obtained by multiplying the embedded length in soil by the nominal width of piles from the centre of the clutches. Operations such as lifting, handling and removing from the site shall be described and included in the item.

6. METHOD OF MEASUREMENT OF CAST *IN SITU* DRIVEN CONCRETE PILES

6.1 The description of the pile shall state the nominal diameter, grade of concrete, size of aggregate reinforcing bars, length of the cage and the pile.

6.2 Forming pile shafts including concrete, and driving casings to a given level shall be measured as one item in running metres.

6.3 Reinforcement including bars to be left in the pile cap for embedding shall be measured separately [*see* IS : 1200 (Part 8)-1975†].

6.4 The length of the cast *in situ* piles shall be measured from the toe of the pile to the pile cut off level. The description of the pile shall state the diameter and the type of casing, the grade of concrete, and details of reinforcement of the core.

6.5 The provision of pile shoes shall be included in the item.

*Method of measurement of building and civil engineering works: Part 8 Steelwork and ironwork (*third revision*).

*Specification for steel sheet pilling sections (*first revision*).

†Method of measurement of building and civil engineering works: Part 8 Steelwork and ironwork (*third revision*).

6.6 Empty boring shall be measured separately in running metres and the length shall be from working ground level to the cut off level of the pile. The type of filling shall be stated.

7. METHOD OF MEASUREMENT OF CAST *IN SITU* BORED REINFORCED CONCRETE PILES

7.1 Empty boring shall be measured separately in running metres and the length shall be from working level to the cut off level of the pile. The type of filling shall be stated.

7.2 The boring through boulders and rock strata shall be measured extra over.

7.3 Reinforcement in pile including bars to be left in the pile cap for embedment shall be measured separately.

7.4 The description of the pile shall state the nominal diameter, grade of concrete, size of aggregate, the reinforcing bars, the length of cage, and the provision of liners, if any.

7.5 Permanent mild steel liners, if provided, shall be measured separately in weight in accordance with IS : 1200 (Part 8)-1975* from working level to foundation level.

7.6 In case of under-reamed or bulb based piles, the bulbs shall be measured and enumerated. The description of piles shall state the diameter of the bulb.

8. METHOD OF MEASUREMENT OF REINFORCED CEMENT CONCRETE SHEET PILES

8.1 The reinforced cement concrete sheet piles shall be measured in cubic metres arrived at by multiplying the cross-sectional area of the pile by the length of the pile as cast from the head of the pile to the tip of the shoes.

8.2 The description of the item shall include the cross-sectional shape, grade of concrete, size of aggregate and extra strength of the head. Any requisite mould shall be included in the description as also necessary strapping, bolts and lifting holes.

8.3 Lifting, handling, pitching engaging through adjacent piles and driving shall be measured separately for each type in square metres obtained by multiplying the length of the embedded portion of the pile and half the parameter of the section. The length of the embeded portion shall be obtained by measuring from the level of the ground where the tip of the pile first touches before driving to the ultimate level of the tip of the piles after driving.

8.4 Wherever sheet piles are to be driven under/in water necessitating the use of special hammers and/or loader frames, such piles shall be described by measuring separately.

8.5 Driving corner piles and junction piles shall be measured separately.

8.6 Cutting piles shall be measured in running metres as extra over. The disposal of cut length shall be described.

8.7 The extraction of piles other than due to defective driving shall be measured separately in square metres as mentioned in **8.3**.

9. METHOD OF MEASUREMENT OF TIMBER SHEET PILES

9.1 The timber sheet piles shall be described and measured in running metres stating the species of timber and cross-section.

9.2 Handling, transportation and pitching of piles shall be enumerated for each occasion.

9.3 Driving timber sheet piles shall be measured in square metres obtained by multiplying the length of the embedded portion of the pile in soil and half the perimeter of the construction.

9.4 Whenever sheet piles are to be driven under/in water necessitating the use of special hammers and/or loader frames, such piles shall be described and measured separately.

9.5 The corner and junction piles shall be measured separately.

9.6 Cutting pile shall be measured in running metres as extra over. The disposal of cut length shall be described.

9.7 The extraction of piles other than due to defective driving shall be measured separately as in **9.3**.

10. METHOD OF MEASUREMENT OF BORED PRECAST CONCRETE PILES

10.1 The precast reinforced concrete bored piles shall be described according to grade of concrete, and size of aggregate section and length, the extra strength of the heads being stated. Any requisite mould shall be included in the description as also the necessary strapping, bolts and lifting holes.

10.2 The cement concrete shall be measured separately in cubic metres arrived at by multiplying the cross-sectional area of the pile by the length of pile as cast from the head of the pile

*Method of measurement of building and civil engineering works: Part 8 Steelwork and ironwork (*third revision*).

to the tip. No deduction shall be made for chamfers, tapered points or the volume of reinforcement or holes for lifting piles.

10.3 The formwork, links and sleeves shall be included in the description of the item.

10.4 The reinforcement shall be measured separately [*see* IS : 1200 (Part 8)-1975*].

10.5 Placing pile shaft shall be measured in running metres from founding level to working level of the pile.

10.6 Empty boring shall be measured separately in running metres and the length shall be from working ground level to the cut off level of the pile. The boring through boulders and rock strata except in respect of isolated boulders not exceeding the diameter of the pile shaft shall be made measured as extra over.

10.7 The measurement of handling, transportation and pitching of piles shall be enumerated for each occasion.

10.8 For strapping the heads of the pile, the length to be stripped shall be stated and measured in running metres.

10.9 Stripping off the heads of the pile for bond length shall be enumerated.

10.10 Grouting shall be measured in cubic metres describing fully the type of method.

*Method of measurement of building and civil engineering works: Part 8 Steelwork and ironwork (*third revision*).

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Review of Indian Standards

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Amendments Issued Since Publication

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