***भारतीय मानक***

***Indian Standard***

**IS 9669 : 2024**

**सीबीआर सांचा और उसके सहायक उपकरण — विशिष्टि**

*( पहला पुनरीक्षण )*

**CBR Mould and its**

**Accessories ― Specification**

*( First Revision )*

ICS 13.080.20; 93.020

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भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

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**October 2024 Price Group X**

Soil and Foundation Engineering Sectional Committee, CED 43

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Soil and Foundation Engineering Sectional Committee had been approved by the Civil Engineering Division Council.

There are a series of standards on methods of testing of soils. It has been recognized that reliable and inter-comparable test results can be obtained only with the standard testing equipment capable of giving the desired level of accuracy. With this objective, a series of specifications covering the requirements of equipment used for testing soils have been published to encourage their development and manufacturing in the country.

The equipment covered in this standard is used for determination of California bearing ratio (CBR) value covered in IS 2720 (Part 16) : 1987 ‘Methods of test for soil: Part 16 Laboratory determination of CBR (*second revision*)’.

This standard was first published in 1980. The present revision has been taken up with a view to incorporate the modifications found necessary as a result of experience gained in the use of this standard. Also, in this revision, the standard has been brought into latest style and format of Indian Standards, and references to Indian Standards, wherever applicable have been updated. BIS certification marking clause has been modified to align with the revised *Bureau of Indian Standards Act*, 2016.

This standard contributes to the Sustainable Development Goal 9: ‘Industry, innovation and infrastructure’: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

The composition of the Committee responsible for formulation of this standard is given in Annex B.

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 : 2022 ‘Rules for rounding off numerical values (*second* *revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

CBR MOULD AND ITS ACCESSORIES ― SPECIFICATION

*( First Revision )*

**1 SCOPE**

This standard covers the requirements for mould, cutting collar, base plate, spacer disc, weights, penetration plunger and other accessories used for the determination of California bearing ratio (CBR) value.

**2 REFERENCE**

The standards listed in Annex A contain provisions, which through references in this text constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards.

**3 DIMENSIONS**

Dimensions with tolerances of different components of CBR mould and its accessories shall be as detailed in Fig. 1 to Fig. 10. Except where tolerances are specifically mentioned against the dimensions, all dimensions shall be taken as nominal, and tolerances thereon shall be as given for medium class in IS 2102 (Part 1).

**4 MATERIALS**

The materials for construction of the various components of CBR mould and its accessories shall be as given in Table 1.

**Table 1 Materials for Construction of Different Components of CBR Mould and its Accessories**

(*Clause* 4)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl No.** | **Equipment** | **Material** | **Special Requirement,****if any** | **Conforming to Indian Standard** |
| (1) | (2) | (3) | (4) | (5) |
| i) | 1. Mould (*see* Fig. 1)
 | a) Copper alloy, or | – | IS 318 |
|  | 1. Cutting collar (*see* Fig. 2)
 | b) Brass, or | – | IS 292 |
|  | 1. Base plate (*see* Fig. 3)
 | c) Phosphor bronze, or | – | IS 28 |
|  |  | d) Mild steel | Chrome-plated | IS 513 (Part 1) |
| ii) | Spacer disc and handle (*see* Fig. 4) | Mild steel | – | IS 513 (Part 1) |
| iii) | Weights (*see* Fig. 5) | Cast iron | – | IS 210 |
| iv) | Adjustable stem with perforated plate (*see* Fig. 6) | Brass | – | IS 410 |
| v) | Penetration plunger (*see* Fig. 7) | Mild steel | Plated | IS 513 (Part 1) |
| vi) | Stay rod (*see* Fig. 8) | Mild steel | – | IS 513 (Part 1) |
| vii) | Wing nut and washer (*see* Fig. 9) | Forged steel or cast steel | Cadmium/chrome-plated | – |
| viii) | Tripod (*see* **5.4**) | Copper alloy | – | IS 318 |

**5 CONSTRUCTION**

**5.1 Mould**

The mould shall be smooth from inside and shall have two ears either cast integral with the body or welded. It shall have suitable seatings at the ends for positioning the collar and the base plate (*see* Fig. 1)

**5.2 Collar**

The collar shall be made from the same material as that of mould. Two similar ears, as in the case of the mould, shall be cast integral with the body or welded. It shall have suitable seatings at the lower end for sitting flush with the mould (*see* Fig. 2).



All dimensions in millimetres.

Fig. 1 Mould



All dimensions in millimetres.

Fig. 2 Cutting Collar

**5.3 Base Plate**

A suitable seating of about 2 mm deep shall be provided on the top face for proper seating of the mould (*see* Fig. 3), and shall be of the same material as that of the mould.

**5.4** The details of other accessories, namely, spacer disc, weights, adjustable stem with perforated plates, penetration plunger, stay rod and wing nut, are given from Fig. 4 to Fig. 9. The details of tripod are given in Fig. 10.



All dimensions in millimetres.

Fig. 3 Base Plate



All dimensions in millimetres.

Fig. 4 Spacer Disc and Handle



All dimensions in millimetres.

Fig. 5 Metal Weights



All dimensions in millimetres.

Fig. 6 Adjustable Stem and Perforated Plates



All dimensions in millimetres.

Fig. 7 Penetration Plunger



All dimensions in millimetres.

Fig. 8 Stay Rod



STEEL WASHER WING NUT

All dimensions in millimetres.

Fig. 9 Wing Nut and Washer



All dimensions in millimetres.

Fig. 10 Metal Tripod

**6 MARKING**

**6.1** The following information shall be clearly and indelibly marked on each CBR mould and its accessories:

1. Name of manufacturer or his registered trade-mark or both;
2. Type of material used; and
3. Date of manufacture.

**6.2** **BIS Certification Marking**

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

**ANNEX A**

(*Clause* 2)

**LIST OF REFERRED STANDARDS**

|  |  |
| --- | --- |
| *IS No.* | *Title* |
| IS 28 : 1985 | Specification for phosphor bronze ingots and castings (*fourth revision*) |
| IS 210 : 2009 | Grey iron castings ― Specification (*fifth revision*) |
| IS 292 : 1983 | Specification for leaded brass ingots and casting (*second revision*) |
| IS 318 : 1981 | Specification for leaded tin bronze ingots and castings (*second revision*) |
| IS 410 : 1977 | Specification for cold rolled brass sheet, strip and foil (*third revision*) |
| IS 513 (Part 1) : 2016 | Cold reduced carbon steel sheet and strip: Part 1 Cold forming and drawing purpose (*sixth revision*) |
| IS 2102 (Part 1) : 1993 | General tolerances: Part 1 Tolerances for linear and angular dimensions without individual tolerance indications (*third revision*) |

**ANNEX B**

(*Foreword*)

**COMMITTEE COMPOSITION**

Soil and Foundation Engineering Sectional Committee, CED 43

| *Organization* |  | *Representative(s)* |
| --- | --- | --- |
| In Personal Capacity (*473, Vinayak Apartments, BHEL Housing Society, Plot No. C-58/19, Sector 62, Noida* - *201301*) |  | Shri C. Pushpakaran **(*Chairperson*)** |
| AFCONS Infrastructure Limited, Mumbai |  | Dr Sunil BasarkarDr Lakshmana Rao Mantri (*Alternate* I)Shri Budhmal Jain (*Alternate* II) |
| AIMIL Limited, New Delhi |  | Shri Rohitash Barua Shrimati Aarti Bhargava (*Alternate* I)Shri Anil Singh (*Alternate* II) |
| Bharat Heavy Electricals Ltd, New Delhi |  | Shri T. M. S. Rao |
| CEM Engineers and Consultants Pvt Ltd, Bhubaneswar |  | Shri Ashok BasaShri Dilip Basa (*Alternate*) |
| Cengrs Geotechnica Pvt Ltd, Noida |  | Shri Sanjay GuptaShri Ravi Sundaram (*Alternate*)  |
| Central Board of Irrigation and Power, New Delhi |  | Director |
| Central Electricity Authority, New Delhi |  | Shri Baleshwar Thakur Shri Deepak Singh Raghuvansi (*Alternate*) |
| Central Public Works Department, New Delhi |  | Shri Nagendra PrasadShri Amrendra Kumar Jalan (*Alternate*) |
| Central Soil and Materials Research Station, New Delhi |  | Dr Manish Gupta Ms Swapna Varma (*Alternate*) |
| CSIR - Central Building Research Institute, Roorkee |  | Shri Manojit SamantaDr S. Ganesh Kumar (*Alternate*) |
| CSIR - Central Road Research Institute, New Delhi |  | Dr Kanwar SinghDr P. S. Prasad (*Alternate*) |
| CSIR - Structural Engineering Research Centre, Chennai |  | Dr P. KamatchiShrimati R. Sreekala (*Alternate*) |
| D-CAD Technologies, New Delhi |  | Dr K. G. Bhatia  |
| Delhi Development Authority, New Delhi |  | Shri Arun KumarShri Harindar Pal (*Alternate*) |
| Delhi Technological University, New Delhi |  | Prof Ashok Kumar Gupta  |
| Engineers India Limited, New Delhi |  | Shri V. K. PanwarShri Sampat Raj (*Alternate*) |
| Geodynamics Ltd, Vadodara |  | Dr Ravikiran Vaidya Shri Sujan Kulkarni (*Alternate*) |
| Geological Survey of India, Kolkata  |  | Dr Timir Baran GhosalShri Prashant Tukaram Ilamkar (*Alternate*) |
| Ground Engineering Limited, New Delhi |  | Shri Ashok Kumar Jain Shri Neeraj Kumar Jain (*Alternate*) |
| Hindustan Construction Company Limited, Mumbai |  | Representative  |
| Indian Geotechnical Society, New Delhi |  | Prof H. N. RameshDr Anil Joseph (*Alternate* I) Prof D. Neelima Satyam (*Alternate* II) |
| Indian Institute of Science, Bengaluru |  | Prof Jyant KumarProf G. Madhavi Latha (*Alternate*) |
| Indian Institute of Technology Bombay, Mumbai |  | Prof Deepankar ChoudhuryProf Dasaka Murty (*Alternate*) |
| Indian Institute of Technology Delhi, New Delhi  |  | Dr G. V. RamanaDr J. T. Shahu (*Alternate*) |
| Indian Institute of Technology Kanpur, Kanpur  |  | Prof Priyanka Ghosh |
| Indian Institute of Technology Madras, Chennai |  | Prof Subhadeep BanerjeeProf Ramesh K. Kandasami (*Alternate*) |
| Indian Institute of Technology Roorkee, Roorkee |  | Dr Mahendra SinghDr Vishwas A. Sawant (*Alternate*) |
| Indian Road Congress, New Delhi |  | Secretary General Director (T) (*Alternate*) |
| Indian Society of Earthquake Technology, Roorkee |  | Prof B. K. MaheswariProf Vasant A. Matsagar (*Alternate*) |
| ITD Cementation India Ltd, Kolkata |  | Shri Manish Kumar Shri Aminul Islam (*Alternate*) |
| Jadhavpur University, Kolkata  |  | Prof Sibapriya Mukherjee Prof Ramendu Bikas Sahu (*Alternate*) |
| Keller Ground Engineering Pvt Ltd, Chennai |  | Shri V. V. S. RamadasShri Madan Kumar Annam (*Alternate*) |
| L&T GeoStructure Private Limited, Chennai |  | Shri M. KumaranShri A. Vetriselvan (*Alternate*) |
| MECON Limited, Ranchi |  | Shri Shankar Ray Shri Ayush Srivastava (*Alternate*) |
| Military Engineer Services, Engineer-in-Chief's Branch, Integrated HQ of MoD (Army), New Delhi |  | Shri Manoj BapnaShri Ajay Kumar Sinha (*Alternate*) |
| Ministry of Ports, Shipping and Waterways, New Delhi |  | Shri H. N. AswathShri Anil Pruthi (*Alternate*) |
| Mumbai Port Trust, Mumbai |  | Dy Chief Engineer (Design)Superintending Engineer (Design) (*Alternate*) |
| Nagadi Consultants Pvt Ltd, New Delhi |  | Dr V. V. S. Rao Shri N. Santosh Rao (*Alternate*) |
| National Capital Region Transport Corporation, New Delhi |  | Shri Jitender Kumar |
| National High Speed Rail Corporation Ltd, Mumbai |  | Representative  |
| National Institute of Disaster Management, New Delhi |  | Dr Chandan GhoshDr Amir Ali Khan (*Alternate*) |
| NTPC Limited, Noida |  | Shri Mohit Jhalani |
| Power Grid Corporation of India Limited, Gurugram |  | Representative |
| Research Designs and Standards Organization (Ministry of Railways), Lucknow |  | Shri Sameer Singh Shri S. K. Ojha (*Alternate*) |
| RITES Limited, Gurugram |  | Shri Koshy VaidyanShri Sumeet Mahajan (*Alternate*) |
| Safe Enterprises, Mumbai |  | Shri Vikram Singh Rao Shri Suryaveer Singh Rao (*Alternate*) |
| STUP Consultants Pvt Ltd, Mumbai |  | Shri Anirban SenguptaShri Yogesh Waingankar (*Alternate*) |
| Tata Consulting Engineers Limited, Mumbai |  | Shri Sanjeev Gupta  Shri B. N. Nagaraj (*Alternate*) |
| Telangana State Research Laboratories, Hyderabad |  | Shri A. G. Manoj KumarShri Ashirwadam Jakkula (*Alternate* I) Shrimati M. Manjula (*Alternate* II) |
| The Pressure Piling Co (I) Pvt Limited, Mumbai |  | Shri V. C. Deshpande Shri Pushkar V. Deshpande (*Alternate*) |
| Unique Geocivil Services Pvt Ltd, Surat |  | Shri Nehal H. DesaiShri Hitesh H. Desai (*Alternate* I)Shri Dhruval D. Shah (*Alternate* II) |
| In Personal Capacity (*1-B, Villakkupattam Palace, First Floor, 48, New Avadi Road, Kilpauk, Chennai - 600010*) |  | Dr V. Balakumar |
| BIS Directorate General |  | Shri Dwaipayan Bhadra, Scientist ‘E’/Director and Head (Civil Engineering) [Representing Director General (*Ex-officio*)] |
| *Member Secretary*Shri Dheeraj DamachyaScientist ‘B’/Assistant Director (Civil Engineering), BIS |