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BRITISH STANDARD 497 : 1952

Cast Manhole Covers Road Gully Gratings and Frames

For Drainage Purposes

BRITISH STANDARDS INSTITUTION

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BRITISH STANDARD SPECIFICATION

CAST MANHOLE COVERS ROAD GULLY GRATINGS AND FRAMES

FOR DRAINAGE PURPOSES

B.S. 497 : 1952

Price 6/- net

BRITISH STANDARDS INSTITUTION
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THIS BRITISH STANDARD, having been approved by the Hardware and Ironmongery Industry Standards Committee and endorsed by the Chairman of the Building Divisional Council, was published under the authority of the General Council on 10th July, 1952.

First published, July, 1933.
First revision, December, 1945.
Second revision, July, 1952.

The Institution desires to call attention to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

In order to keep abreast of progress in the industries concerned, British Standards are subject to periodical review. Suggestions for improvements will be recorded and in due course brought to the notice of the committees charged with the revision of the standards to which they refer.

A complete list of British Standards, numbering over 1800, indexed and cross-indexed for reference, together with an abstract of each standard, will be found in the Institution's Yearbook, price 7s. 6d.

This standard makes reference to the following British Standards:—

B.S. 51. Wrought iron for general engineering purposes (Grades A, B and C).
B.S. 340. Pre-cast concrete kerbs, channels, edgings and quadrants.
B.S. 369. Phosphor bronze bars and rods for general purposes.
B.S. 592. Carbon steel castings for general engineering purposes.
B.S. 729. Methods of testing the zinc coating on galvanized articles other than wire (copper sulphate test and visual examination).

British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or edition.

HIB/16

CO-OPERATING ORGANIZATIONS

The Hardware and Ironmongery Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives of the following Government departments and scientific and industrial organizations:—

British Ironfounders' Association
British Lock and Latch Manufacturers' Association
British Metal Window Manufacturers' Association
British Plastics Federation
British Plastics Hardware Association
Cast Butt Hinge Manufacturers' Association
*D.S.I.R.—Building Research Station
*Distributors of Builders' Supplies Joint Council
*Institution of Municipal Engineers
*London County Council
Ministry of Housing and Local Government
*Ministry of Works
National Brassfoundry Association
National General Export Merchants Group
National Federation of Building Trades Employers
National Federation of Ironmongers
*Royal Institute of British Architects

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this standard:—

Association of Metropolitan Borough Engineers and Surveyors
British Cast Concrete Federation
British Electricity Authority and Area Boards
British Valve Manufacturers' Association
British Waterworks Association
Crown Agents for the Colonies
D.S.I.R.—Road Research Laboratory
General Post Office
Institute of Works and Highways Superintendents
Institution of Civil Engineers
Institution of Sanitary Engineers
Institution of Water Engineers
Midland Ironfounders' Association
Ministry of Transport
Sanitary Inspectors' Association
Society of British Gas Industries
Water Companies' Association
Individual manufacturers

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BRITISH STANDARD SPECIFICATION FOR

CAST MANHOLE COVERS, ROAD GULLY GRATINGS AND FRAMES

FOR DRAINAGE PURPOSES

FOREWORD

Previous editions of this British Standard were prepared primarily for use in connexion with the programme of post-war building. In deciding upon the patterns to be included the committee was, therefore, guided by the need to facilitate mass production. Nevertheless, it was felt that the quality of the articles specified should be controlled by means of an adequate testing procedure, in view of the importance of preventing accidents to road users. In preparing the standard the committee also took into account the need to limit, as far as possible, the troubles experienced in the past because of 'rocking'.

The committee responsible for the preparation of this revision felt that it would be of assistance to manufacturers—in enabling them to incorporate new ideas and improvements within the framework of the main dimensions—if the minor dimensions were deleted. The typical drawings have been amended accordingly.

The standard includes a range of covers for heavy duty applications, together with covers for medium duty. The '3-point' system of support was adopted; the circular type of cover has been excluded so far as heavy duty applications are concerned, in order to minimize the tendency to rock. It is appreciated that, initially, the circular cover may provide non-rocking features but because of the effects of wear, it cannot be certain that this condition will continue. Nevertheless, the circular type of cover has been included in the medium duty section as it is felt that the conditions of use are such as to render it less liable to develop rocking. It is pointed out that although the circular cover and frame has been omitted from the heavy duty section the double triangular patterns provided for in this standard are constructed with a circular opening under the squared cover.

The testing procedure requires a proving test on every cover and grating: this course has been adopted because of the unavoidable variations in castings which would not necessarily be revealed by a type test. It has been found that once the preliminary arrangements for carrying out the proving tests are made, the actual testing calls for very little increase in production time.

SPECIFICATION

SCOPE

1. This British Standard specifies requirements for manhole covers and frames and for road gully gratings, covers and frames, intended for use in drainage works.

The standard is divided into four parts, as follows :—

Part 1 specifies general requirements applicable to the articles specified in Parts 2 and 3.

Part 2 deals with manhole covers and frames.

Part 3 deals with road gully gratings, covers and frames.

Part 4 contains tables of dimensions. It includes Fig. 1, 'Detail of keyholes and keys for Grades A, B and C covers'.

PART ONE : GENERAL REQUIREMENTS

MATERIALS

2. *Manhole covers and frames* shall be cast from a mixture of cast iron scrap and a suitable grade of pig iron. The composition of the resultant metal shall be such as to provide a strong grey structure, free from chill.

Grade A (heavy duty) gully gratings shall be manufactured from cast iron of the quality specified above for manhole covers and frames, or from cast steel of Grade A quality as specified in Clause 1 of B.S. 592* as ordered by the purchaser.

Gully gratings (other than Grade A) and gully covers and frames shall be manufactured from cast iron of the quality specified for manhole covers and frames. The grid in Grade C kerb type covers shall be of wrought iron complying with the requirements of B.S. 51†, Grade C.

Bolts for Grade A double triangular covers and frames shall be of phosphor bronze complying with B.S. 369‡; they shall be ¾ in. Whitworth hexagon bolts, 3½ in. long, screwed 1½ in. complete with nut and locknut.

NOTE. Owing to the shortage of non-ferrous metals, steel bolts suitably protected against corrosion are permissible, if agreed by the purchaser.

MANUFACTURE AND WORKMANSHIP

3. All covers, gratings and frames shall be cleanly cast and shall be free from air and sand holes and from cold shuts. They shall be neatly dressed and carefully fettled. All castings shall be free from voids, whether due to shrinkage, gas inclusions or other causes.

* B.S. 592, 'Carbon steel castings for general engineering purposes'.
† B.S. 51, 'Wrought iron for general engineering purposes (Grades A, B and C)'.
‡ B.S. 369, 'Phosphor bronze bars and rods for general purposes'.

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DIMENSIONS

4. The dimensions of the various types of cover, grating and frame shall conform to those specified in Tables 1—14, as appropriate. A choice of sizes is included in some of the tables.

Covers shall have a raised 'checker' design on the top surface to provide an adequate non-slip grip. This design may include lettering to indicate the owner and the manufacturer. The lettering shall be of a size that will assist in forming a non-slip surface.

Where a checker pattern is shown in the drawings accompanying the tables in this standard it shall not be regarded as specifying a particular design.

The drawings indicate non-ventilating types of cover; when ventilating types of cover are ordered the size of the ribs shall be increased sufficiently to ensure that the covers are capable of passing the appropriate loading test.

APPROXIMATE WEIGHTS OF COVERS

5. The approximate weights of the covers given in the appendix to this standard are provided for information only. They do not form part of the requirements of the standard.

PROTECTIVE COATING

6. Manhole covers and frames shall be supplied coated with a black bituminous composition. Road gully gratings and frames shall be supplied uncoated unless otherwise ordered. The coating shall be smooth and tenacious, shall not flow when exposed to a temperature of 145°F. (62·8°C.), and shall not be so brittle as to chip off at a temperature of 32°F. (0°C.).

If covers and frames of Grade C are required to be galvanized, this shall be especially stated in the enquiry and order. The process shall consist of thoroughly cleaning the articles of all scale, rust and dirt by pickling in a bath of dilute acid. Each part shall then be thoroughly washed, dipped in a bath of molten virgin spelter containing not more than 2½ per cent of impurities and shall remain in the bath until all the surfaces are completely and evenly coated with firmly adherent spelter. The coating shall be free from acid spots and unsightly blemishes or other defects. The galvanizing shall comply with the requirements of B.S. 729* where the provisions of that standard are applicable.

LOADING TEST

7. Prior to delivery all covers and gratings shall be subjected to, and shall pass, the loading test specified in Clause 13 or Clause 16, as appropriate. The loading test shall be carried out as follows:—

The cover or grating shall be supported in a frame which may be a standard cover frame or a specially made testing appliance simulating normal conditions of use. The specified load shall be applied without shock through the medium of a bearing block faced with hard rubber or other resilient material. The bearing block shall be of the size specified in Clause 13 or Clause 16 and shall bear centrally on the cover or grating. The block shall be sufficiently rigid to ensure that the load on the cover or grating is equally distributed over the full area of the block. When so tested the cover or grating shall sustain the specified load for a minimum period of 30 seconds, without fracture.

Recessed covers shall be tested before filling with concrete.

* B.S. 729, 'Methods of testing the zinc coating on galvanized articles other than wire (copper sulphate test and visual examination)'.

INSPECTION

8. The manufacturer shall afford all reasonable facilities for carrying out inspection during the course of manufacture. Should the purchaser desire to witness the tests specified in Clause 7, he shall inform the manufacturer accordingly and the latter shall give reasonable notice of the date or dates on which the tests will be carried out. The purchaser shall if he so desires be enabled to carry out inspection on covers, gratings and frames prior to the application of any coating.

MARKING*

9. All covers, gratings and frames purporting to comply with the requirements of this British Standard shall have clearly cast thereon the number of this British Standard, and the appropriate grade, e.g. 'B.S. 497, Grade A,' and such other markings as may be agreed with the purchaser.

CERTIFICATION

10. The purchaser shall, on request, be supplied with a certificate in respect of each delivery certifying that the articles comply with the requirements of this specification and that they have passed the loading test specified in Clause 7.

* The mark B.S. 497 on a product is an indication that the goods purport to comply with the requirements of this British Standard.

The British Standards Institution is the owner of the registered certification trade mark shown below. The presence of the certification mark on a product is an independent guarantee that the product does in fact comply with the requirements of the relevant British Standard. This certification mark may be used by the manufacturer only under licence from the B.S.I., and particulars of the conditions under which licences are granted may be obtained from the Director, British Standards Institution, 24, Victoria Street, S.W.1.

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