

BRIDGE BEARINGS

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Bridge Bearings

2101 General

- 1 Unless otherwise described in Appendix 21/1, bearings shall be supplied and installed in compliance with the Specification Clauses of BS 5400 : Part 9 : Section 9.2 : 1983 including Appendix "A", Guidance Sub-Clauses 7.2(b) and (c), and tables therein, all as amended by Clause 2104.

2102 Surface Preparation and Protection Against Corrosion

- 1 Unless otherwise described in Appendix 21/1, the surface preparation and corrosion protection of bearings shall comply with the relevant clauses in the 1900 Series.

2103 Bedding Mortars

- 1 Bedding mortars shall comply with Clause 2601.

2104 Amendments and Additions to BS 5400 : Part 9 : Section 9.2 : 1983

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- 3.1 line 4
Delete 'or approved by the engineer' and insert "in Appendix 21/1".

- 3.2.2 At end of paragraph 1 add the following:
"Surfaces in contact shall have the same nominal strength.

Through hardened components shall not have a surface hardness greater than 450 Hardness Vickers (HV) except for the materials given in clauses 3.2.2.1 and 3.2.2.2. The maximum difference in surface hardness of any single component shall not exceed 30 HV and of any single bearing assembly shall not exceed 50 HV.

3.2.2.1 Composite Steels in Roller Bearings. Steels for use in the production of composite roller bearings shall be weldable structural steel with a minimum tensile strength of 470 N/mm². The contact surfaces of both the roller and roller plates shall be faced with a

hard corrosion resistant surface applied by weld deposition or forging having a maximum hardness of 650 HV. The applied surface layer shall consist of a tough buffer layer and a number of corrosion resistant layers to give the required thickness.

The thickness in mm of the applied layer on the roller and plates measured from the finished surface to the base metal shall be greater than:

$$0.14R - 2$$

Where R is the minimum radius of the contact surface of the bearing in mm.

The chemical composition of the applied layers shall be as follows:

Composition of deposited layer:

C	0.2% - 0.35%
Cr + Mo	12.0% - 18.0%
Mn	0.3% - 0.7%
Si	0.2% - 0.6%
P max	0.03%
S max	0.025%
P max + S max	0.03%
N max	0.02%

Composition of weld material for the buffer layer:

C max	0.1%
Cr max	15.0%
Mn	0.2% - 1.0%
Si	0.2% - 1.0%
P max	0.03%
S max	0.03%
P max + S max	0.03%
N max	0.04%

3.2.2.2 Special Steels for Roller Bearings. Special steels for use in the production of roller bearings where a permanent oil bath is provided shall have a minimum tensile strength following hardening of 1350 N/mm² and a maximum hardness of 530 HV. Prior to production a detailed sequence of hardening procedure is to be laid down and proof provided that this procedure does not give rise to significant metallurgical defects. Production of hardened roller bearings shall follow this procedure in every respect. The steel shall have a chemical composition as follows:

C	0.7% - 0.8%
Si	0.3% - 0.4%
Mn	0.8% - 0.9%
Cr	1.8% - 2.0%

Table 1

Against "Steel Plates and Flats" delete 'BS 4360' and insert "BS EN 10025"

Against "Steel Bars" delete 'BS 4360' and insert "BS EN 10025"

Against "Steel Sections" delete 'BS 1775' and insert "BS 6323", delete 'BS 4360' and insert "BS EN 10025"

Against "Stainless Steel" delete '316S16' and insert "316S31"

Against "Hot-dip Zinc coated and iron-zinc alloy coated steel, plate and strip" delete 'BS 2989' and insert "BS EN 10147"

3.6.1 paragraph 1, line 5

Delete 'grade A of BS 3784 : 1973' and insert "grade A1 of BS 6564 : Part 2".

Page 3

3.7.3.8 line 4

Delete 'by the Engineer' and insert "in Appendix 21/1".

3.7.4.1 paragraph 1, line 3

Delete 'the Engineer directs tests to be made on samples cut from a finished bearing' and insert "tests are required to be made on samples cut from a finished bearing as described in Appendix 21/1".

3.7.5 line 5

Delete 'to the Engineer'.

3.10 line 10

Delete 'Engineer' and insert "National Roads Authority".

Page 4

4.1 line 1

Delete 'by the Engineer' and insert "in Appendix 21/1".

4.3.2 line 2

Delete 'by the Engineer' and insert "in Appendix 21/1".

4.7 line 4

Delete 'by the Engineer' and insert "in Appendix 21/1".

5.1 line 2

Delete 'or approved by the Engineer' and insert "in Appendix 21/1".

Page 6

5.4.8 line 3

Delete 'or approved by the Engineer' and insert "in Appendix 21/1".

6.1

Delete entire sub-clause and insert the following:

"Aluminium alloy components. Permanently exposed surfaces of aluminium alloy components shall be degreased and painted as described in Appendix 21/1. The surfaces of aluminium alloy components which will be in contact with concrete or mortar shall be treated before installation with two coats of alkali resistant bituminous paint complying with BS 3416 or BS 6949."

6.2 line 2

Delete 'or approved by the Engineer' and insert "in Appendix 21/1".

6.4 line 2

Delete 'to the satisfaction of the Engineer'.

7.1 line 5

Delete 'to the approval of the Engineer'.

7.1 line 7

Delete 'by the Engineer' and insert "when required".

7.2

Delete entire sub-Clause and insert the following:

"Testing of complete bearings. When described in Appendix 21/1, testing shall be carried out in accordance with the Guidance sub-Clauses 7.2(b) and (c). The bearings shall be considered satisfactory when the results of the tests comply with Section 9.2, and any other special requirements described in Appendix 21/1."

8.3.1 line 2

Delete 'or approved by the Engineer' and insert "in Appendix 21/1".

8.3.1 line 3

Delete 'except with the prior approval of the Engineer' and insert "except under expert supervision and with assistance from the manufacturer".

8.3.1 line 6

Delete 'be agreed with the Engineer' and insert "not be detrimental to the bearing or the structure".

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8.3.1 line 3

Delete 'at a time to be agreed by the Engineer' and insert "at the appropriate time before the bearings are required to accommodate movement".

8.3.2.1 line 3

Delete 'or approved by the Engineer' and insert "in Appendix 21/1".

8.3.2.2 paragraph 2, line 3 and line 5

Delete 'by the Engineer' and insert "in Appendix 21/1".

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7.2(b)(1) after paragraph 9

Insert additional paragraph as follows:

"The value of the partial material factor γ_m referred to in this clause shall be 1.00 for the serviceability limit state, and 1.10 for the ultimate limit state for all materials except aluminium alloys in castings; for which γ_m shall be 1.00 for the serviceability limit state and 1.30 for the ultimate limit state."

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7.2(b)(2)(i) paragraph 3, line 9

At end of sentence insert the following:

"All these tests shall be carried out on the same testing machine. The tests on a batch of bearings shall be completed within a period of 24 hours wherever possible and in no case exceeding 72 hours".

7.2(b)(2)(i) paragraph 4, line 3

Delete 'to the Engineer'.

7.2(c)(2) paragraph 2, line 1

Delete 'the Engineer' and insert "Appendix 21/1".

Pages 8, 10 and 11

All clauses in Appendix A and the Guidance sub-Clauses 7.2(b) and (c) in BS 5400 : Part 9 : Section 9.2 : 1983.

Delete all occurrences of 'should' and insert "shall" with the exception of the word 'Should' at the start of paragraph 3, sub-Clause 7.2(c)(2).