1620.4.

No. RW/NHVI 50 (3)/83 *Dated the 12th July, 1985*

To

The Secretaries, Public Works Departments and Chief Engineers of State Public Works Departments and Union Territories dealing with National Highways and other Centrally Financed Roads, D.G. Works, CPWD, D.G.B.R. and C.E. Pamban Bridge, Madras

Sub : Use of elastomeric bearings on bridges-need for ensuring use of best quality raw materials and carrying out tests on the bearings-need to restrict the supply of elastomeric bearings from reputed firms having proper equipments and testing facilities and also the responsibility of inspection and testing of such bearings to be entrusted to DGS&D

As is well known, bearings form a very important component of any bridge and the long term structural safety and servicability of the entire structure depends on the bearings. Since more and more of elastomeric bearings are coming in vogue, it is of paramount importance to ensure that only the best quality raw materials and workmanship are used in manufacturing these bearings, which should invariably satisfy the prescribed standards and specifications laid down in the Interim Specifications issued by the Ministry vide our letter No. RW/NHVI-67|(3)/76-Vol. III dated 27.6.85. Suitable instructions in this regard have already been issued vide this office letter Nos. PL-67 (20)/76-NHVI dated 24.8.77 and 29.6.79 and RW/NHVI-67 (20)/76-Vol. II dated 11.1.83.

2. In continuation of the detailed instructions issued by the Ministry vide the above referred circular letters, it appears that the requisite safeguards are not being insisted upon with the result that some instances have recently come to our notice where substandard elastomeric bearings have been deployed, even though unintentionally. Needless to say that the replacement of substandard bearings (after a bridge has been opened to traffic) is not only costly in terms of time and money, it also leads to dislocation of traffic and a serious risk to the safety of the bridge structure is involved. Keeping this in view, the instructions contained in the Ministry's letter No. RW/NHVI-67 (20)/76-Vol. II dated 11.1.83 are again reiterated to impress upon all Highway Engineers the desirability of complying with the guidelines issued from time to time.

3. For the sake of flawless compliance, the important steps required for avoiding dilution of quality of the raw materials and fabrication of elastomeric bearings are enumerated hereunder :

3.1. Suitable provision in the N.I.T. :

The following clauses shall be inserted in the N.I.Ts. relating to bridges on National Highways or under other Centrally Financed Schemes :

(i) "In respect of elastomeric bearings intended for use in the superstructure of any bridge, the contractor shall be required, in the course of manufacture, to arrange and afford all facilities for the prupose of inspection and testing of all or any of the parts and the materials used in these bearings, to any officer of the Directorate of Inspection, DGS&D, Ministry of Supply, Government of India, and such bearings shall not be used except on production of a certificate of acceptance alongwith a

summary of test results thereof from the Directorate of Inspection. All inspection charges shall be payable by the Contractor".

(ii) The suppliers shall ensure that the elastomeric bearings are designed and manufactured strictly in accordance with the Interim Specifications issued by the Ministry of Shipping & Transport (Roads Wing) vide their letter No. RW/NHVI-67 (3)/76-Vol. III dated 27.6.85.

3.2. Pre-qualification of Suppliers :

As far as possible, the supplies of elastomeric bearings shall be taken only from a panel of pre-qualified firms, the panel being drawn up by the State Chief Engineers in consultation with this Ministry. This panel may be updated from time to time, as found necessary. In order to ensure that a uniform policy is adopted in the procedure relating to pre-qualification of firms for the supply of elastomeric bearings, the pre-qualification may be carried out on the basis of the Questionnaire enclosed as Annexure I. The requirement of pre-qualification of firms for the supply of elastomeric bearings will also have to be clearly stipulated in the N.I.T.

4. A Statement showing (i) acceptance requirements; and (ii) institutions in the country where facilities for conducting various tests on elastomeric bearings are available is enclosed vide Annexure II. A list of addresses of the Regional Directors of Inspection of the Directorate of Inspection, Ministry of Supply, Government of India, who undertake such jobs of inspection, is enclosed vide Annexure III.

5. It is requested that suitable instructions may kindly be issued to the field officers for judicious selection of manufacturers/suppliers of elastomeric bearings, strict enforcement of the Interim Specifications relating to such bearings issued by the Ministry vide letter No. RW/NHVI-67 (3)/76-Vol. III dated 27.6.85 and insistence on inspection certificate before acceptance of the bearings for use on bridges.

6. Further, it is requested that for a proper feed-back, the performance of elastomeric bearings is got checked at regular intervals (say twice a year) and records maintained for future reference.

7. It is hoped that action on the above lines would be taken so as to minimise the chances of sub-standard elastomeric bearings being accepted for our bridge works.

Enclosure to letter No. RW/NHVI-50 (3)/83 dated 12.7.85

ANNEXURE I

QUESTIONNAIRE TO BE SUBMITTED ALONGWITH APPLICATION FOR PRE-QUALIFICATION OF FIRMS FOR SUPPLY OF ELASTOMERIC BEARINGS FOR USE IN BRIDGES

Sl. No.	Question	Reply
1.	How many years has your organisation been in business as a manufacturer/supplier of elastomeric bearings under your present business name?	
2.	Do you have your own factory with complete facilities for the manufacture of elastomeric bridge bearings? If so, furnish documentary evidence in support thereof.	
3.	What is the technical experience of the principal individuals of your organisation?	

Individual's Name	Present position of office	Total years of technical experience	Years with the firm	In what capacity
(1)	(2)	(3)	(4)	(5)

4.	Are you on the approved list of manufacturers/suppliers of elastomeric bridge bearings with DGS&D? If so, furnish a copy of the registration certificate.	
5.	What are your sources of procurement of synthetic rubber? Give documentary evidence in support thereof.	
6.	What is the average consumption of synthetic rubber per year in your factory for the last 3 years?	
7.	What is the average volume of production (in cubic cms. per month) of elastomeric bearings in your factory?	
8.	Have you got testing facilities for raw materials as well as finished products (elastomeric bearings) as per procedures laid down in the Interim Specifications of the Ministry of Shipping & Transport (Roads Wing) issued vide their letter No. RW/NHVI-67 (3)/76-Vol. III dated 27.6.85? If so, give detailed information about the arrangements for conducting various tests (the details should include the make of testing equipment, its technical details, date of purchase and whether the equipments are in working order at present).	
9.	If you are not having your own testing arrangements, where do you propose to get the testing of elastomeric bearings done? Give evidence in support thereof.	
10.	Mention special manufacturing techniques, if any, adopted by your firm?	
11.	Mention special quality control measures, if any, adopted in your factory?	

12. Has there been any instance of elastomeric bearings supplied by your firm showing signs of distress? If so, furnish details. Have your bearings been rejected by some client?

13. Performance record for the past 5 years (list all supply contracts completed by your organisation during the past 5 years).

Name & location of the bridge	Authority for which the supply order was executed	Brief details of elastomeric bearings (plan size, thickness etc.).	Year of supply	Inspection certificate No. and date.
(1)	(2)	(3)	(4)	(5)

NOTE : Certificates from the Heads of the Organisation/Department/Project in respect of the satisfactory execution of the supply orders within the stipulated time should be attached.

14. Has your firm been blacklisted or removed from the approved list of suppliers or demoted to lower class etc.?

NOTE : The following declaration should be furnished alongwith the replies to the Questionnaire :-

"I/We agree that if any of the information furnished by me/us in the above document is found to be incorrect, the Department will have the absolute right to strike off my/our name from the approved panel without assigning any reason.

Dated :

Signatures
With Stamp of the firm

ANNEXURE II

STATEMENT SHOWING AVAILABLITY OF FACILITIES FOR CONDUCTING TESTS ON ELASTOMERIC BEARINGS IN INDIA

Sl. No.	Name of the test	Relevant Indian Standard or ASTM Standard	Requirement as per Acceptance Criteria	FACILITIES AVAILABLE IN VARIOUS ORGANISATIONS IN INDIA: I.I.T. Powai Bombay.	Structural Engg. Research Centre, Roorkee	National Test House, Alipore, Calcutta	I.I.T Madras	I.I.T. Kharagpur	C.R.R.I. New Delhi
1	2.	3	4	5a	5b	5c	5d	5e	5f
A.	Tests on the physical Properties of Rubber								
(i)	Determination of Hardness	IS:3400 (Part II)	65 IRHD maximum. 55 IRHD minimum.	Yes	Yes	Yes	Yes	Yes	Yes
(ii)	Minimum Tensile Strength	IS:3400 (Part I)	17 MPa.	Yes	No.	Yes	Yes	Yes	No
(iii)	Minimum percentage Elongation at Break	IS:3400 (Part I)	400	Yes	No	Yes	Yes	Yes	No
(iv)	Maximum percentage Compression Test at 24±2° hrs., at 100±1°C.	IS:3400 (Part X)	35	Yes	No.	Yes	Yes	Yes	No
(v)	Accelerated Ageing Tests 70 hrs. at 100±1°C	IS:3400 (Part IV)		Yes	No.	Yes	Yes	Yes	No
(vi)	Maximum change in hardness		15 IRHD						
(vii)	Maximum change in tensile strength (%)		15						
(viii)	Maximum change in elongation (%)		40						
B.	Tests on elastomeric bearings								
(i)	Minimum Adhesion to metal	IS:3400 (Part IV) (Method A)	7 KN/m	Yes	No.	Yes	Yes	No.	No.

(ii) Ozone Resistance 20% Strain, 96 hrs. at 40±1°C, 50 pphm.	IS:3400 (Part XX).	No Cracks	No.	Yes	No.	No.	No.	Yes	This apparatus is also going to be available with HRS Madras soon.
(iii) Stiffness in Compresion (determination or vertical stress strain curve)	—	± 20%	Yes	Yes	No.	Yes	Yes	Yes	
(iv) Stiffness in Shear (determination of modules G)	—	± 20%	Yes	Yes	No.	Yes	No.	Yes	
(v) Minimum Ultimate Compression Strength	—	60 MPa	No.	Yes	No.	Yes	Yes	Yes	

ANNEXURE III

LIST OF ADDRESSES OF REGIONAL DIRECTORS OF INSPECTION

1. The Director of Inspection, Aayaker Bhavan Annexe, New Marine Lines, Bombay.
2. The Director of Inspection, 1, Ganesh Chandra Avenue, Calcutta-13.
3. The Director of Inspection, 35, Haddows Road, Madras-5.
4. The Director of Inspection, N.I. Circle, Block No. 13, Jamnagar House Hutment, New Delhi-11,
5. The Deputy Director of Inspection, 4/286, Nawabganj, Kanpur.