1620.8

No. RW/NH-34057/1/2002-S&R(B) *Dated the 23rd July, 2002*

Subject: Pre-Qualification of manufacturers of bearings for bridges on National Highways and other centrally sponsored schemes

Applications are invited from experienced and competent manufacturers of Elastomeric/Pot-cum-PTFE/Steel Rocker & Roller bearings for pre-qualification as suppliers of bearings for bridge works on National Highways and other centrally sponsored schemes. The validity of the existing list of pre-qualified suppliers expires on 31.12.02. Applications have also been invited by the Ministry through advertisements in leading newspapers during the third week of June, 2002. The requirement of supply of such bearings shall be notified to you from time to time by the various agencies responsible for execution of bridges on NHs and other centrally sponsored schemes.

2. Interested firms including those who already stand pre-qualified by the Ministry till 31.02.02 should submit the requisite information in duplicate in the prescribed format (copy enclosed) along with the application for pre-qualification to the Superintending Engineer, Bridges (Standards and Research), Ministry of Road Transport & Highways, Parivahan Bhawan, No.1, Parliament Street, New Delhi-110 001 so as to reach him latest by 16.08.02. The format is also available on this Ministry's website morth.nic.in.

3. Ministry, if it so decides, can go in for separate pre-qualification for specific jobs.

(Enclosure to Ministry's letter No. RW/NH/34057/1/2002-S&R (B) dated the 23rd July, 2002)

APPLICATION FORMAT FOR PRE-QUALIFICATIONOF MANUFACTURING FIRMS AUTHORIZED SUPPLIERS FOR SUPPLY OF BRIDGE BEARINGS FOR BRIDGES ON ZONAL HIGHWAYS & OTHER CENTRALLY SPONSORED SCHEMES

FORM I : ELASTOMERIC BEARING

Details of firm :

1.1 Name and address of firm :
1.2 Name of the authorized contact person
1.3 Phone No. (office & works)
1.4 Fax No. :
1.5 E-mail address :

2. Financial status (Attach relevant audited/authenticated documents to support the statements made here)

2.1 Annual turn over during last five years (year-wise)
2.2 Liquid assets :
2.3 Bank loan facility :

3. Whether the firm has got its own manufacturing unit or is having collaboration with any other manufacturing company (attach relevant documentary evidence of ownership or collaboration as the case may be)

3.1 Address & telephone No. (in case of collaboration with other firm) of the other firm (Full details of the collaborating firm as per this format to be furnished)

4. The year from which the firm is in business of manufacturing of elastomeric bearings

5. Source of procurement of raw materials

(i) Chloroprene, viz. neoprene WRT or Bayprene 110 or Skyprene B-5 or Denka S-40V
(ii) Steel Plates

(Note: An undertaking to the effect that the firm shall be using only the prescribed type elastomer as mentioned above and the elastomer shall be imported directly from the manufacturer or purchased from their authorized representative in India may please by furnished).

6. Manufacturing -

6.1 Method of manufacturing:

6.2 Equipments available with the firm:

SL. NO.	EQIPMENT	WHETHER AVAILABLE OR NOT
i	Mixing mill	
ii	Hydraulic press	
iii	Moulding press	
iv	Shot blasting machine	
v vi	Shearing machine Cutting machine	
vii	Surface grinder	
viii	Kneader	
ix	Vulcaniser	
x	Mechanical power press	
xi	Others, if any	

7. Following information relating to the last five years or since the date of start of business by the firm whichever is less, may please be furnished on yearly basis.

7.1 Quantity, rate and type of elastomer materials procured (in kg) for manufacturing elastomeric bearings (copies of original documents of procurement of elastomer to be attached)

(i) Elastomer
(ii) Steel plates

7.2 Consumption of elastomer (in kg) in production of elastomeric bearings

7.3 Details of bearing manufactured from the raw material procured, viz., nos. of each size of bearings specifying the size.

7.4 Details of supply of elastomeric bearings indicating the name of project, address of the client, nos., size and capacity of the bearings, ex-factory rate of supply (in Rs. per cubic cm) (for both completed/on-going projects) (copies of original vouchers in support of rates, quantity and size to be attached).

7.5 Details of elastomer and finished bearings in stock as on.....(the date of forwarding the application by the firm).

7.6 Performance certificates from clients regarding bearings supplied (copies of original vouchers in support of rates by the client, quantity and size to be attached).

7.7 Test results of finished bearings, if any, carried out during last year from independent reputed laboratory (copies of original test certificates indicating the size of bearings and the relevant project where supplied).

8. Position regarding availability of the services of a full time-

8.1 Qualified chemist for manufacture and conducting tests for chemical composition of elastomer (details viz, name, qualification and experience are to be furnished).

8.2 Design Engineer (details viz., name, qualification and experience are to be furnished) for design, manufacture and testing of finished bearings.

9. It may please be confirmed that periodical tests for ozone resistance of the elastomer are being done by the firm in accordance with cl 915.2.3 of IRC: 83 (part II) 1987 and that the record of the test results are being systematically maintained in the manufacturing unit (copies of original test certificates for the ozone resistance tests carried out during the last 5 years, along with the details indicating the agency through which these tests have been carried out and the periodicity of these tests, needs to be furnished).

ANNEX TO FORM I : ELASTOMERIC BEARINGS

Name of test	Relevant clause of IRC:83-Part-II: 1987	Testing facility in accordance with relevant provisions of the standard	Whether test facility available in-house	Agency from where the tests are got done in case testing facilities are not available in house	Details of equipments available with the firm for carrying out the test	
1	2	3	4	5	6	7
1 Raw materials						
1.1 *Identification of polymer	915.1.5	ASTM D-3677				
1.2 Ash content test (to determine the percentage)	915.1.3	IS: 3400 (Pt. XXII)				
1.3 Specific gravity test		ASTM D-297				
1.4 Polychloroprene content test	915.1.3	ASTM D-297				
* In case of any dispute for estalishing whether any other type of rubber has been mixed with chloroprene in the manufacture of elastomeric bearings, the Deptt. may carry out tests as per ASTM D-3452- 78 (chromatography test) at the manufacturers' cost in a recognised test house.						
2 Physical properties of elastomer						
2.1 Hardness (in IRHD)	915.2	IS:3400 (Pt-II)				
2.2 Minimum tensile strength (in Mpa)	915.2	IS:3400 (Pt-I)				
2.3 Elongation at break (%)	915.2	IS:3400 (Pt-I)				
2.4 Maximum compression set (%)	915.2	IS:3400 (Pt-X)				
2.5 Accelerated ageing	915.2	IS:3400 (Pt-IV)				
2.6 Determination of shear modulus of the elastomer bearings	915.2.1					
2.7 Determination of adhesion strength of elastomer to steel plates	915.2.2	IS:3400 (Pt-XIV Method A)				
2.8 Ozone resistance of elastomer	915.2.3	IS:3400 (Pt-XX)				
3. Test on completed bearings						
3.1 Determination of shear modulus	918.4.1.3					
3.2 Determination of elastic modulus (short term loading)	918.4.1.3					
3.3 Determination of adhesion strength	918.4.1.3					
3.4 Determination of ultimate compressive strength	918.4.1.3					
3.5 Facility for cutting the sides of the test bearings selected at random to 45° for carrying out the adhesion test on finished bearings in accordance with clause 918.4.1.3						

FORM II : POT & POT-CUM-PTEE BEARINGS

Details of firm :

Name and address of firm
Name of the authorized contact person
Phone No. (office & works)
Fax No. :
E-mail address :

Financial status (Attach relevant audited/authenticated documents to support the statements made here)

1. Annual turn over during last five years (year-wise)
2. Liquid assets :
3. Bank loan facility :

Whether the firm has got its own manufacturing unit or is having collaboration with any other manufacturing company (attach relevant documentary evidence of ownership or collaboration as the case may be).

4. Address & telephone No. (in case of collaboration with other firm) of the other firm. (Full details of the collaborating firm as per this format to be furnished).

The year from which the firm is in business of manufacturing of POT/POT-cum-PTFE bearings.

5. Source of procurement of raw materials, viz. Steel, cast steel, PTFE and elastomer etc.

(Note: An undertaking to the effect that the firm shall be using only the prescribed type of elastomer as mentioned above and the elastomer shall be imported directly from the manufacturer or purchased from their authorized representative in India may please be furnished).

6. **Specifications:** Please state whether the firm is experienced and capable to produce bearings conforming to the following specifications:

6.1 **Steel**

6.1.1 Mild steel to be used for the components of bearings shall generally comply with grade B of IS:2062. However, grade C of IS:2062 shall be used for sub zero condition.

6.1.2 High tensile steel used for the components of the bearings shall comply with IS:8500.

6.1.3 Caste steel shall comply with grade 280-520 W or grade 340-570 W of IS:1030.

6.1.4 Steel for forgins used for components of bearings shall comply with class 3, 3A or 4 of IS:1875 and steel forgings shall comply with class 3, 3A or 4 of IS:2004.

6.1.5 Stainless steel shall conform to AISI:316L or $O_2Cr_{17}Ni_{12}Mo_2$ of IS:6911.

6.2 **PTFE:** The raw material for PTFE shall be pure polytetrafluoroethylene free sintered without regenerated materials or fillers. The mechanical and physical properties of unfilled PTFE shall comply with grade A of BS:3784 or equivalent. PTFE shall either be in the form of solid rectangular modular or dimpled large sheet. Use of PTFE sheet with dimples made by machining or drilling from a selected PTFE sheet is not permitted. Clause 925.2 of IRC:83 (Part III)-2002 should be followed.

6.3 **Composite Materials:** For guide of Pot bearings composite material complying with the specifications given in clause 925.3 of IRC:83 (Part III)-2002 may be used.

6.4 **Elastomer:** The elastomer to be used for components of bearings shall comply with clause 925.4 of IRC:83 (Part III)-2002.

6.5 **Internal seal:** For Pot bearings, the internal seal preventing the extrusion of elastomer through the piston cylinder interface under load shall conform to Clause 925.5 of IRC:83 (Part III)-2002.

6.6 **External seal:** For Pot bearings the external seal for preventing ingress of moisture and debris through the gap between the piston and cylinder shall be of suitable profile made of elastomer.

6.7 **Wiper seal:** Wiper seal to be provided for retaining the lubrication and preventing contamination of the sliding surfaces shall be of suitable profile made of elastomer.

6.8 **Fasteners:** Bolts, screws, nuts and lock nuts shall generally conform to IS:1363, IS:1364, IS:1365, IS:2269, IS:3138, IS:6761 as appropriate with mechanical properties conforming to IS:1367. Threads shall generally conform to IS:428. Washers shall conform to IS:2016, IS:6610 as appropriate.

7. **Design:** Design of the Pot and Pt cum PTFE bearings shall conform to clause 926 of IRC:83 (Part III)-2002. The firm should have the services of a design engineer available for this purpose.

8. **General:** All relevant clause of IRC:83 (Part III)-2002 must be followed.

8.1 Manufacturing method and finishing of the bearings should conform to clause 927.2 and 927.3 of IRC:83 (Part III)-2002 respectively.

8.2 Manufacturing tolerances must be as per specifications given in clause 927.1 of IRC:83 (Part III)-2002.

8.3 Inspection and testing of the bearings should conform to clause 928.4 and 928.6 of IRC:83 (Part III)-2002 respectively.

9. **Equipments:** whether available or not with the firm:

Manufacturing equipments	Testing equipments
1. Lathe	1. Loading testing machine for elastomer
2. Milling machine	2. Load testing press
3. Slotting machine	3. Durometer
4. Drilling machine	4. Ageing oven
5. Hydraulic press	5. Dye penetration testing
6. Air compressor	6. Universal tensile testing machine
7. Buffing machine	7. Hardness testing machine for steel
8. Cylindrical grinding machine	8. Tensile testing machine for elastomer
9. Planer machine	9. Cutting press for disc moulding
10. Shaper machine	10. Specific gravity balance
11. Rubber mixing mill	11. Muffle furnace for ash content
12. Kneader	12. Compression set apparatus
13. Shot blasting machine	13. Ultrasonic testing machine
14. Cutting machine for PTFE sheets	14. Equipment for friction test of finished bearing
15. Metrology Equipments (Dimensional control)	15. Equipment for rotation test on finished bearing
16. Others, if any	16. Equipment for surface roughness test for stainless steel sheets.
	17. Others, if any

10 Following information relating to the last five years or since the date of start of business by the firm whichever is less may please be furnished on yearly basis:

10.1 Quantity, rate and type of constituent materials procured (in kg) for manufacturing Pot/Pot-cum-PTFE bearings (copies of original documents of procurement of PTFE/elastomer to be attached).

10.2 Consumption of elatomer (in kg) in production of Pot/Pot-cum-PTFE bearings.

10.3 Details of bearings manufactured from the raw material procured, viz., nos. of each size of bearings specifying the size.

10.4 Details of supply of Pot/Pot-cum-PTFE bearings indicating the name of project, address of the client, nos., size and capacity of the bearings, ex-factory rate of supply (for both completed/on-going projects) (copies of original vouchers in support of rates, quantity and size to be attached).

10.5 Details of elastomer and finished bearings in stock as on.....(the date of forwarding the application by the firm).

10.6 Performance certificates from clients regarding bearings supplied (copies of original vouchers in support of rates by the client, quantity and size to be attached).

10.7 Test results of finished bearings, if any, carried out during last year from independent reputed laboratory (copies of original test certificates indicating the size of bearings and the relevant project where supplied).

11. Position regarding availability of the services of a full time-

11.1 Qualified chemist for manufacture and conducting tests for chemical composition of elastomer (details viz., name, qualification and experience are to be furnished).

11.2 Design Engineer (details viz, name, qualification and experience are to be furnished) for design, manufacture and testing of finished bearings.

FORM III : STEEL ROCKER & ROLLER/SPHERICAL/PIN BEARING

1. Details of firm :

1.1 Name and address of firm :
1.2 Name of the authorized contact person
1.3 Phone No (office & works)
1.4 Fax No. :
1.5 E-mail address :

2. Financial status (Attach relevant audited/authenticated documents to support the statement made here).

2.1 Annual turn over during last five years (year-wise)
2.2 Liquid assets :
2.3 Bank loan facility :

3. Whether the firm has got its own manufacturing unit or is having collaboration with another manufacturing company (attach relevant documentary evidence of ownership collaboration as the case may be).

3.1 Address & telephone No. (in case of collaboration with other firm) of the other firm. (Full details of the collaborating firm as per this format to be furnished).

4. The year from which the firm is in business of manufacturing of bridge bearings under consideration:

5. Source of procurement of raw materials for manufacturing steel/roller-cum-rocker bearing, spherical, pin bearings:

6. **Specifications:** Please state whether the firm is experienced and capable to produce bearings conforming to the following specifications:

6.1 **Steel roller & rocker bearings**

6.1.1 The material to be used in the bearing shall conform to MORT&H Specifications for Road & Bridge Works Clause 2003.1 & Clause 904 IRC:83 (Part-I)-1999.

6.1.2 Design considerations clause 907 IRC:83 (Part-I)- 1999 must be followed.

6.1.3 Testing: Clause 909 IRC:83 (Part-I) - 1999 & clause 2003.5.4 of MORT&H Specifications for Road & Bridge Works must be followed.

6.2 **Spherical bearings:** In general, the spherical bearings must conform to BS:5400 parts 9.1 and 9.2, clause 2004 of MORT &H Specifications for Road & Bridge Works.

6.2.1 **Material specification:** all materials shall be original, unused or non-recycled conforming to relevant specifications as given in clause 2004.4 of MORT&H specifications.

6.2.2 **Acceptance test spherical bearings:** Clause 2004.6 MORT&H Specifications for Roads & Bridge works must be followed.

6.3 **Pin bearings:**

6.3.1 In general, pin bearing shall conform to BS:5400 parts 9.1 & 9.2 and all the relevant clauses of MORT&H Specifications for Road & Bridge Works.

6.3.2 All materials shall be original, unused or non-recycled conforming to relevant specifications as given in Clause 2004.4 or MORT&H specifications:

- Anchor bolts shall be as per relevant IS Specifications;
- The material of pin bearing including rocker plates shall be high tensile steel conforming to IS:8500.

6.3.3 The steel for forging to be used for the components of the bearings shall comply with class 3, 3A or 4 of IS:1875 and steel forgins shall comply with class 3, 3A or 4 of IS:2004.

7. Manufacturing -

7.1 Method of manufacturing:

7.2 Manufacturing tolerances: They should be as per design and approved specifications.

8. **Equipments** – whether available with the firm or not:

Manufacturing equipments	Testing equipments
1. Lathe	1. Brinall Hardness testing machine of 3000 Kgf (hydraulic type)
2. Slotting machine	2. Ultrasonic testing machine
3. Drilling machine	3. Universal testing machine of minimum 40 MT capacity
4. Hydraulic press	4. Surface finish testing machine to check surface finish S.S. sheet
5. Milling machine	5. Chemical test laboratory to find out carbon, sulphur, phosphorus, manganese, silica and other elements
6. Compressor	6. Equipment for friction test on finished bearing.
7. Buffing machine	7. Metalography for checking of micro structure of different materials.
8. Cylindrical grinder	8. Load testing machine of required capacity having facilities of rotation and lateral loading.
9. Planer machine	9. Others, if any.
10. Shaper machine	
11. Shot blasting machine	
12. Welding machine	
13. Metrology equipment	
14. Others, if any	

9. Following information relating to the last five years or since the date of start of business by the firm whichever is less, may please be furnished on yearly basis. For each type of bearings, viz. steel roller-cum-rocker, pin, spherical bearings, following table must be filled.

9.1 Quantity, rate and type of raw materials procured (in kg) for manufacturing particular type of bearings (copies of original documents of procurement to be attached).

9.2 Consumption of raw material in production of particular type of bearing.

9.3 Details of bearings manufactured from the raw material procured, viz., nos. of each size of bearings

specifying the size.

9.4 Details of supply of particular type of bearing indicating the name of project, address of the client, nos., size and capacity of the bearings, ex-factory rate of supply (for both completed/on-going projects) (copies of original vouchers in support of rates, quantity and size to be attached).

9.5 Details of raw material and finished bearings in stock as on.....(the date of forwarding the application by the firm).

9.6 Performance certificates from clients regarding bearings supplied (copies of original vouchers in support of rates by the client, quantity and size to be attached).

9.7 Test results of finished bearings, if any, carried out during last year from independent reputed laboratory (copies of original test certificates indicating the size of bearings and the relevant project where supplied).

10. Position regarding availability of the services of a full time-

10.1 Qualified chemist for manufacture, quality control and conducting chemical and physical testing of bearings (detail viz., name, qualification and experience are to be furnished).

10.2 Design Engineer (details viz, name, qualification and experience are to be furnished) for design, manufacture and testing of finished bearings.