

RAILWAY STORES SPECIFICATION (RSS) NO. 508

SRI LANKA RAILWAY SPECIFICATION FOR ELASTIC RAIL CLIP BAR **DIAMETER 18MM, THE TOE LOAD RANGE 800 - 950 KG**

The use of equivalent International Standards to those quoted is permissible, subject to submission of supporting document acceptable to the Purchaser.

1. SCOPE

This specification covers the manufacture and test requirements for resilient rail fastenings made from spring steel bar to SLR drawing No.19902 for 'e' type clips. Elastic Rail Clips form part of an Elastic Rail Fastening System and hold the rail to the concrete sleeper, through the cast in shoulder in it.

2. SAMPLES, SPECIFICATION, DRAWING & TEST REPORTS

The Bidders shall submit following with the Bid.

Bidders can submit Elastic Rail Clip Samples for the fastening proposed from the manufacturer's production line along with Specification, Drawing & Test Reports pertaining to them if they comply with RSS and SLR drawing.

- i Five rail clip samples bearing manufacturer's traceability identification code on it.
(05 of Bituminous Coated)
Bidders shall state whether clips are manufactured in production line.
- ii Supplier's Specification in detail as per GCC Clause 3.
- iii Supplier's Drawing
Bidders eligible under ISO / BS EN ISO 9002: 1994 or an equivalent Standard shall submit documentary proof showing that the design of rail clip for the fastening proposed has undertaken by a firm certified to ISO / BS EN ISO 9001: 1994 or an equivalent International Standard.
- iv Test Certificates showing that the fastening proposed comply with RSS in all respects for the purpose of evaluation and comparison of bids as per ITB Cl.26.

3. MECHANICAL CHARACTERISTICS

- i Linear static deflection of in excess 11 mm on installation to give the minimum clamping force of 1,600 Kg. per rail seat
- ii Nominal clamping force - 1,700 to 1,800 Kg. per rail seat
- iii Minimum Longitudinal Rail restraint force
with and without rail pads and insulators in place - 1,000 Kg. per rail seat
- iv The clips should have the required toe-load in the final assembly with Rail Pads and insulators in place and a fatigue life to satisfy dynamic fatigue endurance within
+/- 0.5 mm over 3 million cycles

4. RAW MATERIAL:

The raw material shall be silico-manganese steel to BS 970 Part 2: 1988 Grade 251A58 (modified) of which chemical composition as per Table I is appended below:

<u>Chemical composition</u>	<u>% Minimum</u>	<u>% Maximum</u>
Carbon	0.55	0.60
Silicon	1.8	2.10
Manganese	0.8	1.00
Chromium	0.15	0.3
Molybdenum	-	0.10 Max.
Sulphur	-	0.035 Max.
Phosphorus	-	0.035 Max.

The steel shall be free from detrimental surface and internal defects.

5. FORMED CLIPS:

i Dimensional Accuracy

The rail clips shall be so dimensioned to fit the cast in shoulder and to impart a toe-load of (800-950) Kg.f on the bottom flange of a BS 88/90A rail in the final assembly position with insulators fitted.

Components for the rail fastening systems shall comply with the following standards and all supplies must be accompanied by the steel suppliers certificate of conformity of the steel quality and quality records showing surface conditions of the rolled bar is within the defined tolerance

Bar Specifications -

Tolerance - ± 0.25 on diameter

0.25 mm Maximum ovality

Surface finish - Maximum imperfection depth 0.25 mm

Decarburization - Maximum Partial decarburization 1.5% of the Bar diameter.

Grain Size - Shepherd Grain Size 5 to 8

ii Hardness

The clips shall be heat treated to achieve a surface hardness in the range 44 to 48 Rockwell C.

iii Finish

Clips shall be supplied free of burrs, which may be considered harmful when handled or affect efficient assembly of the clip. Any marks caused by the forming tools shall be smooth and free sharp indentations.

iv Protective Coating

Rail clips shall be provided with protective bituminous coating.

v Identification and Packaging

a Manufacturer's traceability identification code shall be provided on the formed clips along with last two digits of the year of manufacture.

b Packaged clips will be identified by the following information: -

1. Date of manufacture and/or packaging

2. Number of products per package

3. Gross weight of package

The clips shall be supplied preferably in lo-lift bags, containing 40 single bags of each containing 25 clips.

6. SCHEDULE OF TESTS:

i Raw Material

The steel supplier shall submit, with each batch of the raw material, a certificate detailing the chemical composition of the steel during the steel making process and the cast number of the ingot, continuously cast bloom or billet from which it has rolled. The bidder shall provide the material certificate comply with Cl. 4 of this RSS from the steel supplier with each batch.

ii Formed Clips

a Dimensional Accuracy

The rail clips (before coating – Cl 5.(iv)) shall conform to the dimensions detailed on the SLR drawing No.19902 and to Cl. 5.(i) under formed clips.

b Hardness

An area on the surface of the underside of the center log of the clip shall be ground flat. Hardness tests shall be carried out in a hardness testing machine on this area in accordance with BS EN 10109 Part 1 and 2.

Three indentations shall be made on each clip inspected and the mean of these readings shall be used to determine its hardness.

c Visual Inspection

The clips shall be free from excessive burrs at the cropped ends. Any marks caused by the forming tools shall be smooth and free from sharp indentations.

d Clip Toe Load Determination

The force exerted by the clip in a fastening assembly shall be determined using a calibrated test rig or alternative system approved by the SLR to ensure compliance with Cl. – 3 (i) and 3.(ii) of this RSS.

e Longitudinal Rail restraint

The Bidder shall conduct a Longitudinal Rail restraint test as required to satisfy Cl. – 3 (iii) of this RSS.

f Fatigue Test

The Bidder shall conduct a fatigue type test as required to satisfy Cl.3.(iv) of this RSS

7. FREQUENCY OF TESTS AND ACCEPTABILITY LEVELS:

i Production test plan shall be submitted for approval by SLR and shall at least comply with the following requirements in 7.(ii), 7.(iii), and 7.(iv) of this RSS.

ii Dimensional Accuracy and Visual Inspection (Paragraph 6.(ii).(a) and 6.(ii).(c))

Clips shall be inspected in batches of 50,000 Nos. maximum for dimensional accuracy and surface defects. Inspection sample sizes are to be as specified in BS 6001: 1999 / ISO 2859: 1999, for a normal single sample plan, Inspection Level I, and an Acceptable Quality Level of 2.5%.

iii Hardness (Paragraph 6. (ii), (b))

The clips shall be checked for surface hardness to the requirements of section 5. (ii). The sample size shall be as given in BS 6001: 1999 / ISO 2859: 1999, Special Inspection Level S3, and Acceptable Quality Level of 6.5% for a single normal sampling plan.

iv Toe Load Determination (Paragraph 6.(ii).(d))

The toe load of clips shall be determined to BS 6001: 1999 / ISO 2859: 1999, Special Inspection Level S3, Acceptable Quality Level of 6.5% for a single normal sampling plan. The clips shall meet the requirements of section 6, (ii), (d) of this RSS.

8. RE-TESTS:

- i In the case of the tests detailed in Clauses 7.(ii), 7.(iii) and 7.(iv) all test results shall be treated as one set though they were independently obtained for each property.
- ii In the event of a rejection from test, that shall be repeated by taking further samples at the same frequency from the rejected production batch. If this repeat test results is a failure the batch shall be rejected, except in the case of dimensional accuracy and visual inspection tests where the batch may be 100% inspected and resubmitted for acceptance.
- iii Each production batch shall be accepted if the samples meet the test requirements.

9. RESPONSIBILITY FOR INSPECTION

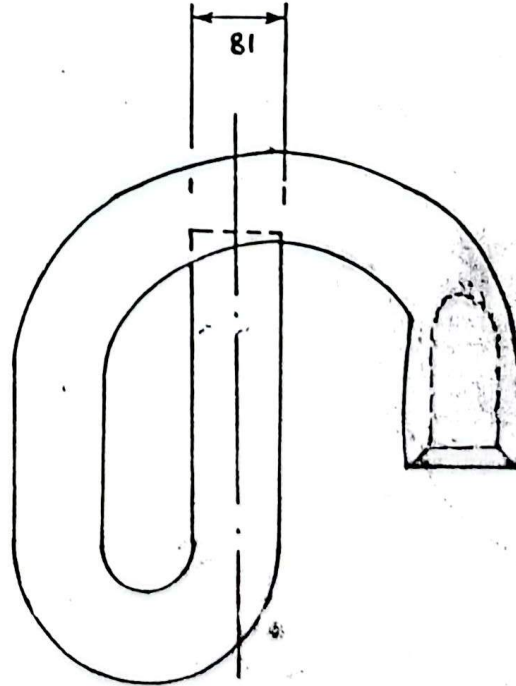
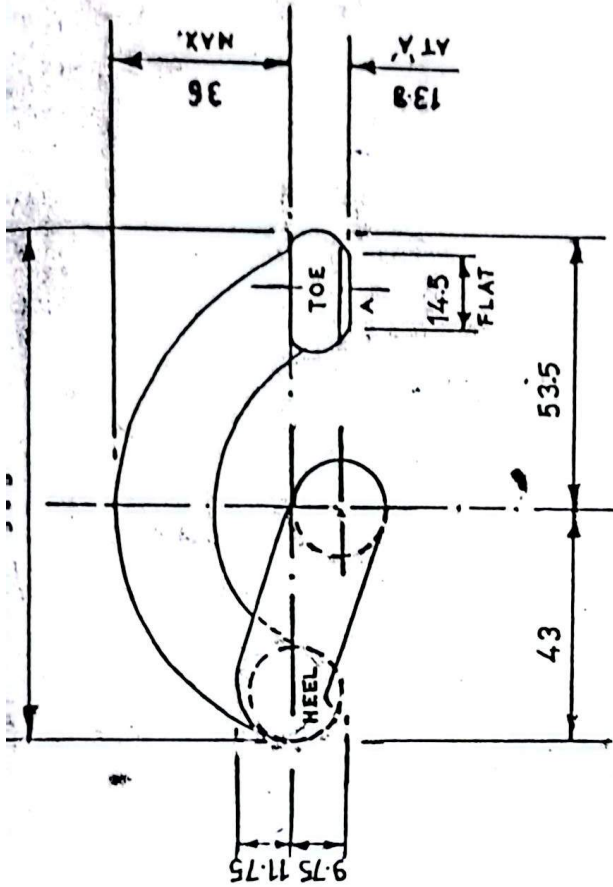
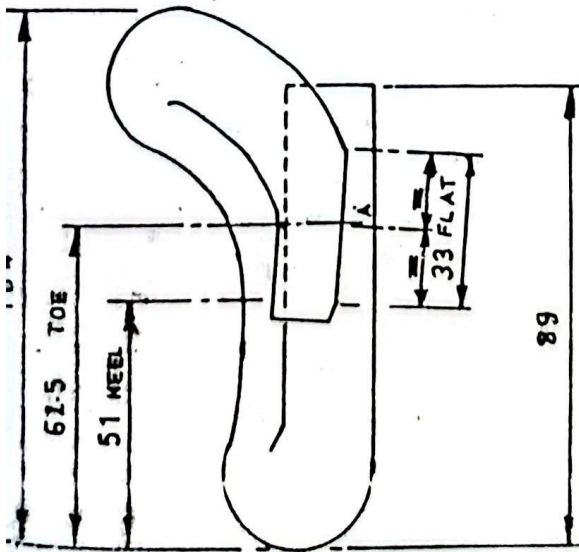
Pre-shipment inspection of Rail Clips of this Bid shall be carried out by Officers of SLR or an International Inspectorate Institute appointed by the General Manager Railways pursuant to Clause 7 of GCC & Clause 2 of SCC.

10. RECORDS

All Quality Assurance records shall be retained for a minimum of five years.

11. CERTIFICATION

A certification of conformity shall be supplied with each consignment confirming that the products meet the requirements of this Railway Stores specification and SLR drawing.



NOTE

ALL DIMENSIONS IN MILLIMETRES
UNLESS OTHERWISE STATED

ELASTIC RAIL CLIP for 80LB/88LB/BS90A RAILS		DRAWN BY <i>JMA</i>	SRI LANKA RAILWAYS WAY & WORKS DEPARTMENT
		CHECKED BY <i>[Signature]</i>	DATE - 05/03/1991
		D.O.A. <i>[Signature]</i>	
		APPR. BY <i>[Signature]</i>	
		CHIEF ENGINEER	