

GENERAL SPECIFICATIONS FOR STEEL BOLTS & NUTS**1. SCOPE**

This standard specifies the dimension and requirements for Bolts & Nuts to use with flat bottom rails.

2. MATERIALS

The steel shall conform to the requirements having property class 6.8 of table 3 (having tensile strength of 600N/mm²) and having chemical composition limits as per table 2 indicated in BSEN 20898-1-1992.

3. MANUFACTURE

Bolts & Nuts shall be produced by hot forging. Nut shall be hot forged. Welding is not permitted. Fasteners shall be clearly finished full fin form and free from burrs and harmful defects.

4. HEAT TREATMENT

Fasteners may be supplied under full heat treated condition and details of the heat treatment shall be given in the manufacturer's certificate.

5. MECHANICAL PROPERTIES

After manufacture under heat treatment, a selected number of fasteners shall be tested to ascertain the mechanical properties of the batch. The sample or test pieces prepared there from shall not be subjected to additional heat treatment prior to testing. For acceptance purpose, all testes according to the table 5 of BSEN 20898-1-1992 test programme B shall be carried out.

5.1 BOLTS**5.1.1 Tensile test for full size Bolts.**

The above shall be carried out as per Clause B.2 of BSEN 208-1-1992.

5.1.2 Hardness test.

The above test shall be carried out as per Clause 8.3 of BSEN 20898-1-1992.

5.1.3 Proofing Load Test for full size Bolts.

The above test shall be carried out as per Clause 8.4 of BSEN 20898-1-1992.

5.1.4 Test for strength under wedge loading of full size Bolts.

The above test shall be carried out as per Clause 8.5 of BSEN 20898-1-1992. The fracture shall occur in the shank of thread of the Bolt and not between the head and the shank.

5.2 NUTS

Nuts shall conform and tested with BSEN 20898-2-1994 having property class 6.

6. DIMENSIONS

As per Drawings Nos. 19669, 21800, 21871, 16324 A and 18750/1 for Fish Bolts & Nuts 80 Lbs, Fang Bolts & Nuts 7 1/2" x 3/4", Fang Bolts & Nuts 8 1/2" x 3/4", Crossing Bolts & Nuts and Bridge Hook Bolts & Nuts respectively.

7. SCREW THREAD

The thread form shall, unless otherwise specified by the purchaser conform to the medium class tolerance in accordance with BS 84.

As an alternative to the spanner test the bolts and nuts may be ordered to comply with the "tight fit" tolerance specified in Clause 12 below and should be BSW thread as required by the purchaser.

8. GAUGING

Gauges used to establish compliance with dimensions and tolerance shall be included in the manufacturer's calibration system for periodic checking to confirm their accuracy and traceable to national standards.

9. QUALITY CONTROL**Option 1:**

If the bidder is not a manufacturer, offer should be supported with a certificate from the manufacturer acceptable to Sri Lanka Railways giving the mode of manufacture and the physical and chemical properties of the materials before and after heat treatment. Bids not complying with above would be considered as unacceptable.

The manufacture shall, as part of his quality control procedure, carry out sufficient inspections and tests to ensure that the specified requirement under BS 5750/ISO 9001:2008 are attained and maintained.

When sample plans are used in the selection of samples they shall be statistically viable.

The result of all inspections and tests shall be recorded and identified to the fasteners they represent and if required made available to the purchaser.

Option 2:

The inspection of all batches of bolts and nuts shall be undertaken by one of the following:-

- (a) The purchaser or their authorized inspectors shall inspect all batches of bolts and nuts ordered and witness any of the tests (see Clause 05), or
- (b) The application of quality assurance system (see the forward make reference to BS 5750/ISO 9001:2003 in the forward).

10. MARKINGS

Each bolt shall be marked on the head in embossed letter and with the trade (identification) mark of the manufacture, SLR and last two digit of the year of manufacture as per Clause 9 of BSEN 2089 - 1- 1992.

11. PROTECTIVE COATING

Before dispatch the finished fasteners shall be protected from atmospheric corrosion, under normal storage conditions by a protective medium. The head of all bolts shall be painted in red and a coat of linseed oil shall be applied for the items.

12. TOLERANCES

12.1 Tolerance on Nominal Length

Nominal Length		Tolerance on length
Over	Up to and including	
mm	mm	mm
30	50	±1.25
50	80	±1.50
80	120	±1.75
120	180	±2.00
180	250	±2.30
250	315	±2.60
315	400	±2.85
400	500	±3.15

12.2 Tolerance on unthreaded shank

Diameter

19mm to 24mm	$\pm 0.84\text{mm}$
24mm to 26mm	$\pm 0.84\text{mm}$

12.3 Tolerance for washers diameter (mm)

Diameter of the bolt (mm)	Interior diameter of the Washer (mm) Allowable tolerance	Quarter diameter of the Washer (mm) Allowable tolerance
19 mm	± 0.2	± 0.75
22 mm	± 0.2	± 0.75
24 mm	± 0.2	± 0.75
26 mm	± 0.2	± 0.75

12.4 Allowable tolerance for thickness of washers

Diameter of the bolt (mm)	Allowable tolerance
19 mm to 24 mm	± 0.2
22 mm to 26 mm	± 0.2

12.5 Tolerance of Hexagon Nuts
Dimensions in millimeter

Nominal size and thread diameter	Width Across Flats	Width across Corners	Thickness of Nut	Tolerance on squareness
19 mm	± 0.5	± 1.0	± 0.65	0.61
22 mm	± 0.5	± 1.0	± 0.65	0.61
24 mm	± 0.5	± 1.01	± 0.65	0.70
26 mm	± 0.5	± 1.3	± 0.65	0.78

12.5 Pitch of Thread (for metric thread)

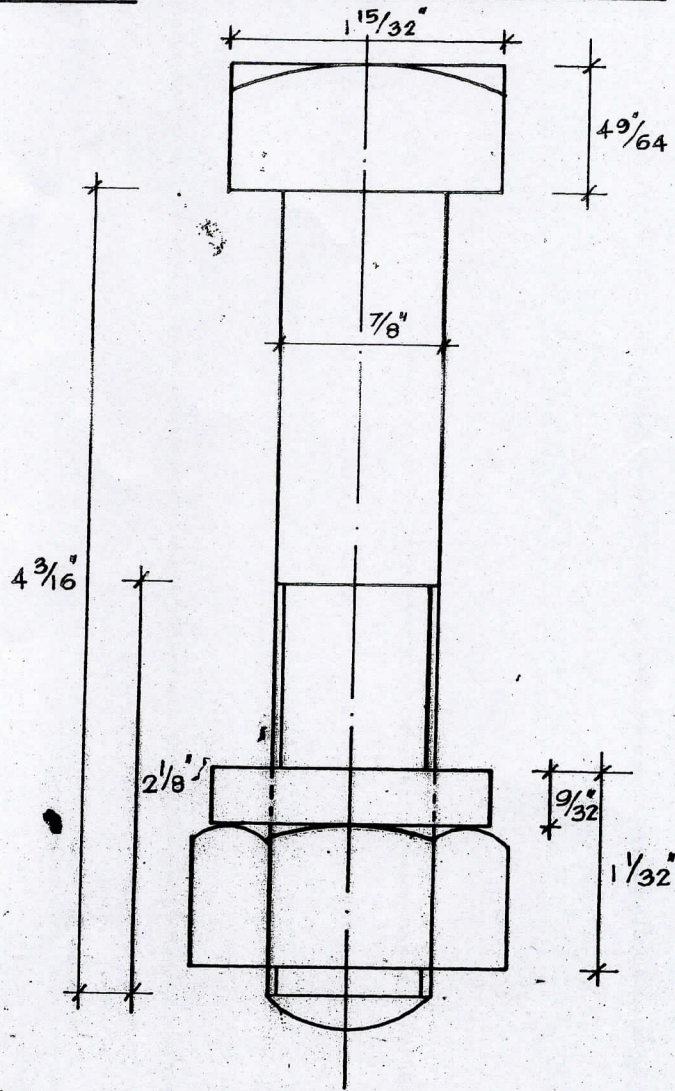
Nominal size and thread diameter	Pitch of thread (coarse pitch series)
19 mm	2.5
22 mm	2.5
24 mm	3.0

13. TIGHTENING OF NUTS TO BOLTS

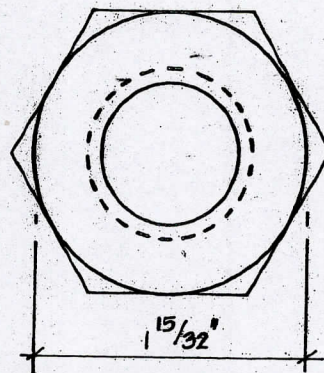
Nuts of all bolts shall be fixed (tighten) to half length (middle of the thread) of thread of the bolts before commencing packing for dispatch. Tightening of nuts should be done only with a prescribed spanner.

FISH BOLT & NUT FOR 80 LB RAIL

DRG : NO . 19669



ELEVATION

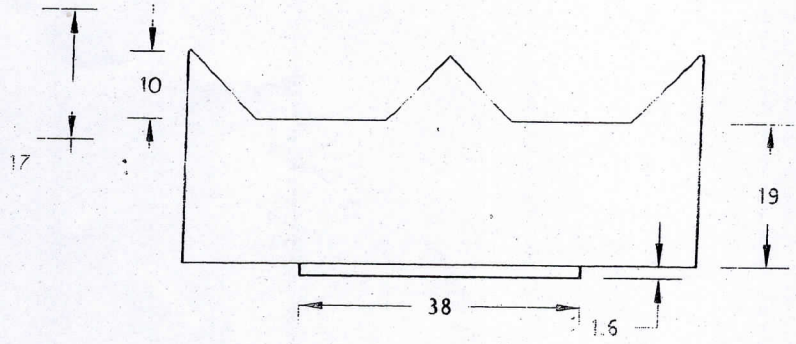
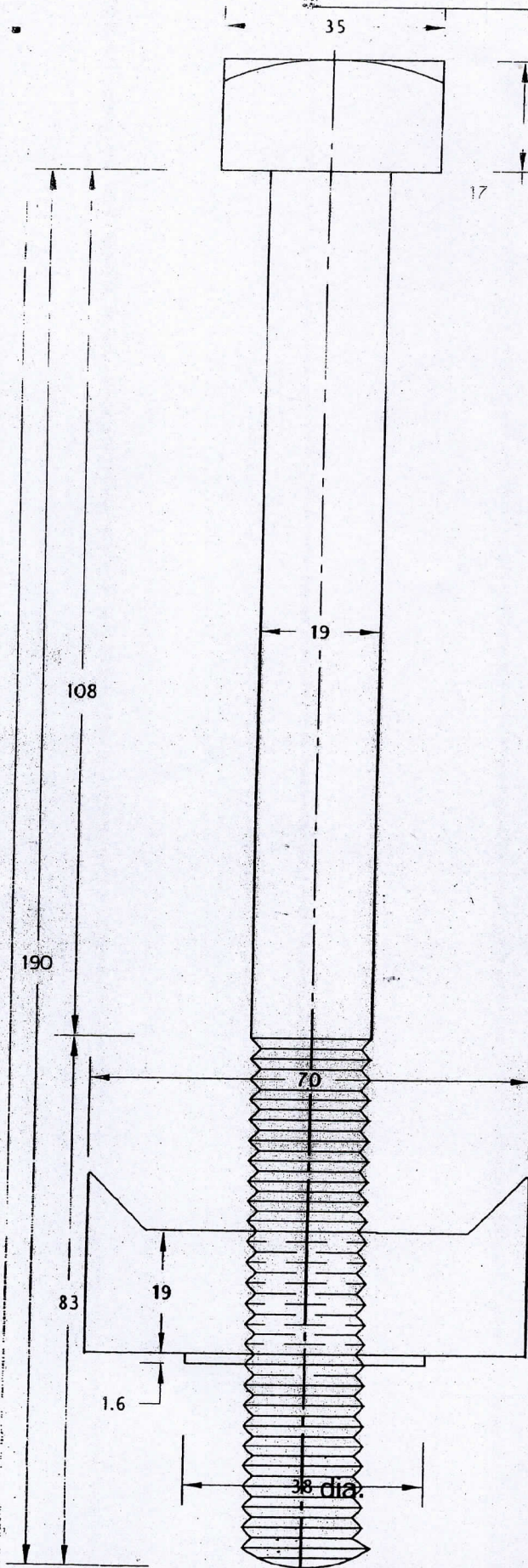


PLAN OF NUT

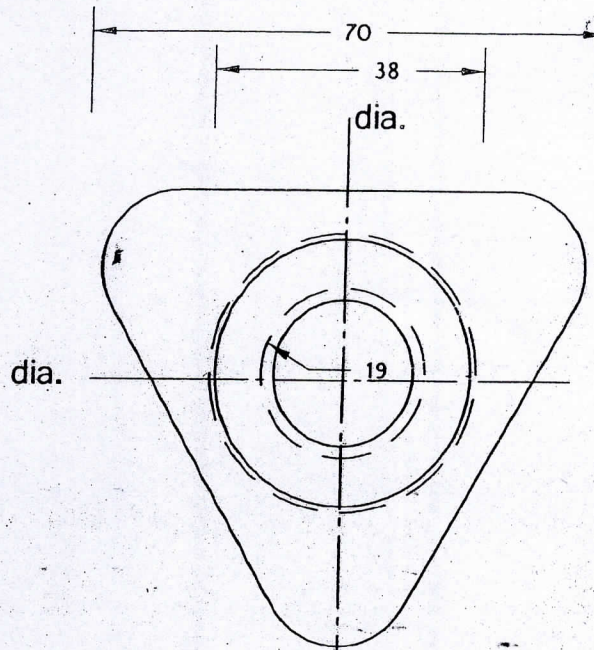
SCALE : FULL SIZE

DRAWN BY: S.G.H.	SRI LANKA RAILWAYS	
	WAY & WORKS DEPT.	
CHECKED BY: <i>[Signature]</i>	DRG. NO. 19669	
	DATE : 10.07.91	
D.O.A.		
APPROVED BY:	CHIEF ENGINEER	

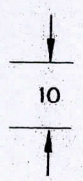
FANG BOLT & NUT (7 1/2") drg.no.21800



E L E V A T I O N



P L A N

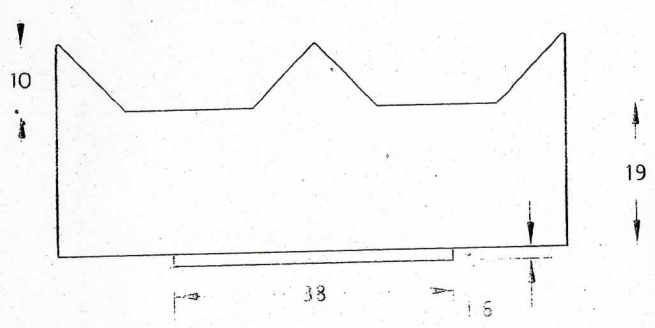
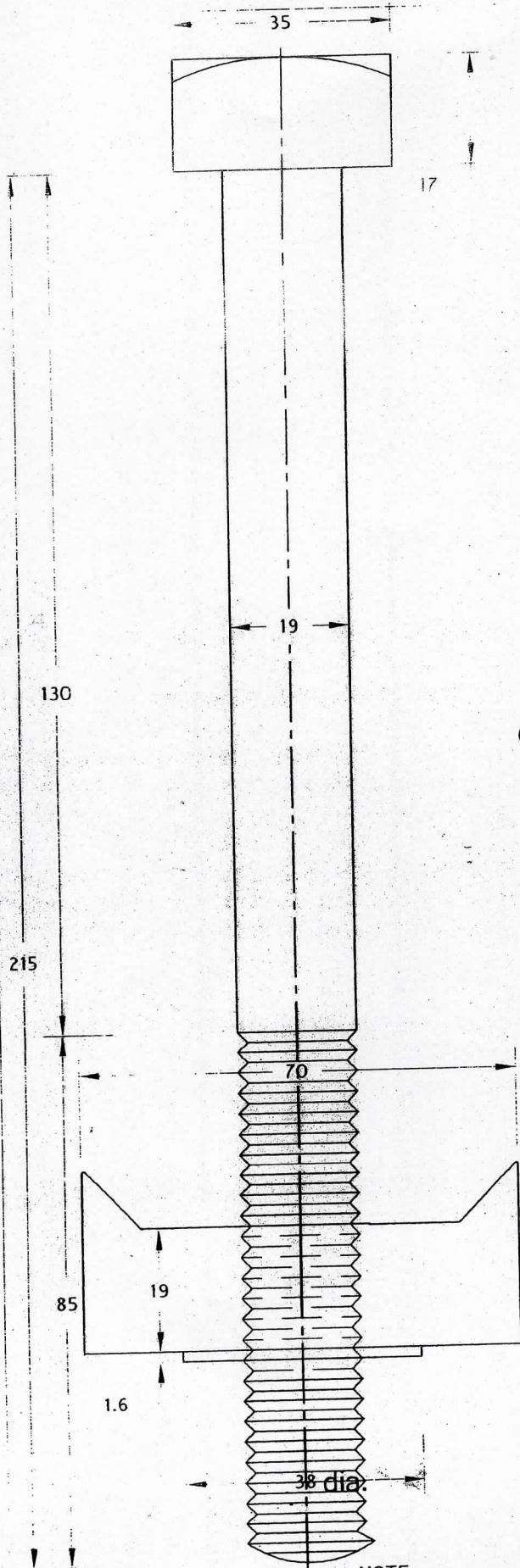


NOTE:-
PITCH 2.5

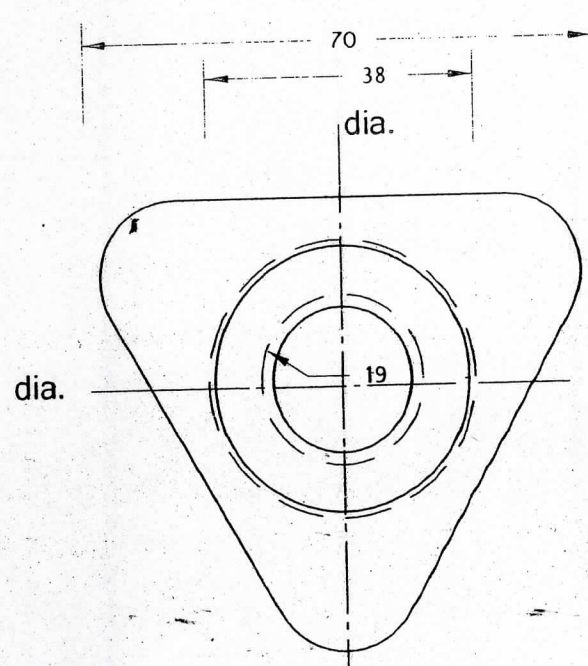
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(All dimensions are in mm.)

DRAWN BY THAMARA <i>[Signature]</i>	SRI LANKA RAILWAYS. WAY & WORKS DEPT.
CHECKED BY PUSHPIKA <i>[Signature]</i>	
D.O.A. <i>[Signature]</i>	DRG. NO.- 21800 (drg.no. - 19400 superseeded)
APPROVED BY <i>[Signature]</i>	2013-05-06 <i>[Signature]</i> CHIEF ENGINEER

FANG BOLT & NUT (8 1/2")



ELEVATION



PLAN

NOTE:-
PITCH 2.5

SCALE - FULL SIZE

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THAMARA *[Signature]*
CHECKED BY
PUSHPIKA *[Signature]*

SRI LANKA RAILWAYS.
WAY & WORKS DEPT.

DRG. NO.- 21871

2013-06-20.

(drg.no. - 19400 superseeded)

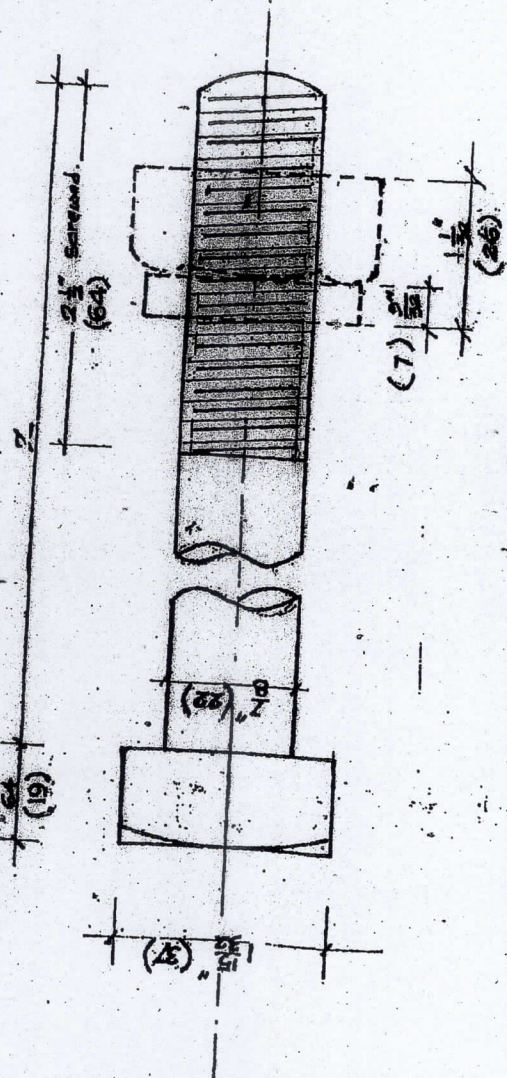
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APPROVED BY
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CHIEF ENGINEER

PLAN NO. 16324 A

SLR
SQUARE HEAD CROSSING BOLT
SCALE FULL SIZE

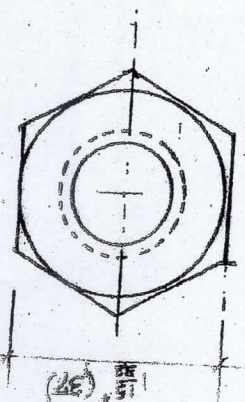


BOLT

HEAD DETAILS:-

MEDIUM TOLERANCE CONFIRMING TO BS 84

NOTE: MILLIMETRE DIMENSIONS ARE SHOWN IN PARENTHESES.



PLAN OF NUT.

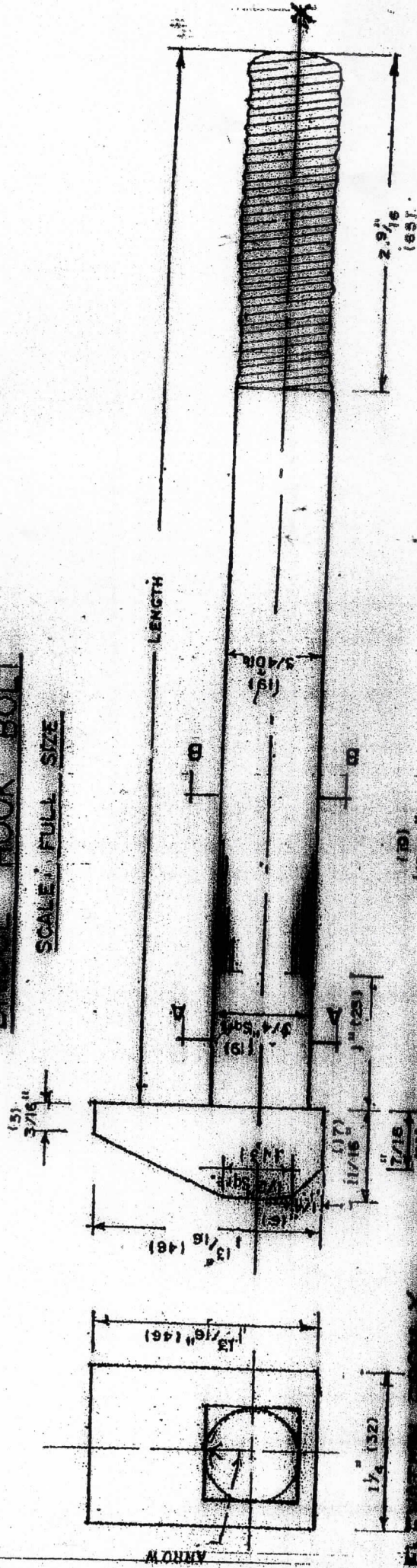
DRAWN BY <i>flat.</i>	SRI LANKA RAILWAYS
CHECKED BY <i>[Signature]</i>	WAY & WORKS DEPARTMENT
DOA	DRW. 16324-A DATE: JULY 1992
APPROVED BY <i>[Signature]</i>	CHIEF ENGINEER

PLAN NO 1000/1

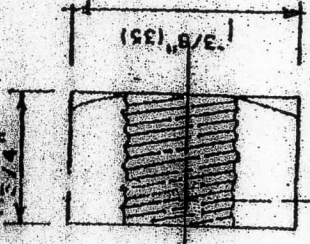
S . L . R

BRIDGE HOOK BOLT

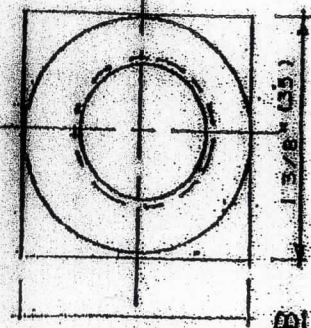
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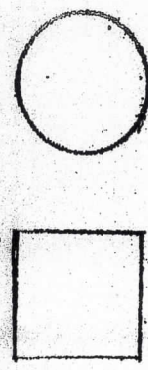
BOLT



NUT



SECTION A-A SECTION B-B



NOTE: MILLIMETRE DIMENSIONS SHOWN IN PARENTHESES

DRAWN BY	SRI LAKSHMI PARANATHS
TRACED BY	W. S. S. S. S. DEPT.
CHECKED BY	PLAN NO 1000/1
	DATE 2008/10/30

J. W. W. W. W. W.
CHIEF ENGINEER

ALL DIMENSIONS ARE SAME FOR VARIOUS LENGTHS OF BOLTS

APPENDIX "D" II**SLR Specification No.: 564****SPECIFICATION FOR STEEL DOG SPIKES 88 LBS. RAIL SECTION**

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

1. Description:

Work included: This section covers the manufacturing and delivering of dog spikes to be provided for track laying as required at the location of the Sri Lanka Railways (hereafter referred as SLR) and cover the requirement for quality of steel manufacturing, tolerance on dimensions and related technical condition for the supply of the products as required.

The materials required shall be manufactured such that upon delivery they are essentially ready for the installation and do not require further cutting and fitting for the typical condition and uses intended.

Installation of these materials is not a part of the requirements of this section.

2. Specifications & Drawings

The bidders shall submit following with the offer.

- i) Supplier's Specifications in detail.
- ii) Supplier's Drawings.

3. Material:

Material of dog spikes shall be rolled steel in accordance with JIS G 3101 or ASTM A 36.

4. Shape and Dimension:

Shape and dimensions of dog spikes shall be in accordance with the SLR Drawing No. 14812/A for 88 lbs. rail section.

5. Quality:

The dog spikes shall be manufactured from rolled steel bar and the surface of track spikes shall be smooth and free from defects such as harmful furrows, cracks and fins.

Any bend or twist shall not exist in the shank, and the head point shall be correctly formed.

6. Finish.

The finished spikes shall be straight, with well formed heads, sharp points and be free from injurious defects and shall be finished in a workmanlike manner.

Underside of the head of the spike shall stand being bent backwards to an angle of 115 degree without crack on the exterior of the bent portion.

Dimensional Tolerances:

The dimensional tolerances shall be as follows:

Item	Tolerance in (mm) -
Cross Section	+ or - 0.5
Head	+ 2.5 or - 1.0
Length under head to point	+ or - 3.0
Length between top of head and under head	+ 2.0 or - 1.0
Angle, underside of head	+ or - 1 degree

8. Test Requirements:

The contractor (supplier) shall be responsible for determining and providing all necessary supervision, inspection, sampling, testing or otherwise controlling the manufacturer such that the materials or items supplied comply with the requirements of these specification.

Materials, or items, individually or in groups where so evaluated, not meeting the requirements of these specifications shall be rejected and not used for the work under this Contract.

9. Marking:

Manufacturer's traceability identification code, "SLR" and last two digits of the year of manufacture shall be pressed on the head of each spike while it is being formed.

10. Shipping Requirements:

Protection: The dog spikes shall be protected against rust during long period of storage, and by such methods and means as proposed and approved.

Irrespective of the method of protection adopted, the whole surface area especially the machine sections, shall be covered with a protective coating.

Packing: Packing used for dispatch shall not have been previously used for any purpose, which would result in damage to these materials.

The package shall be sealed as necessary and each package shall bear the following information as applicable, in clearly indelible characters on label firmly fixed to the package:

- name or the mark of the supplier
- order number
- Description of parts contained
- Number of total weight of the parts.

Maximum weight of packing for each shipment shall be limited to approximately 2 (two) Metric Tons.

11. Certification:

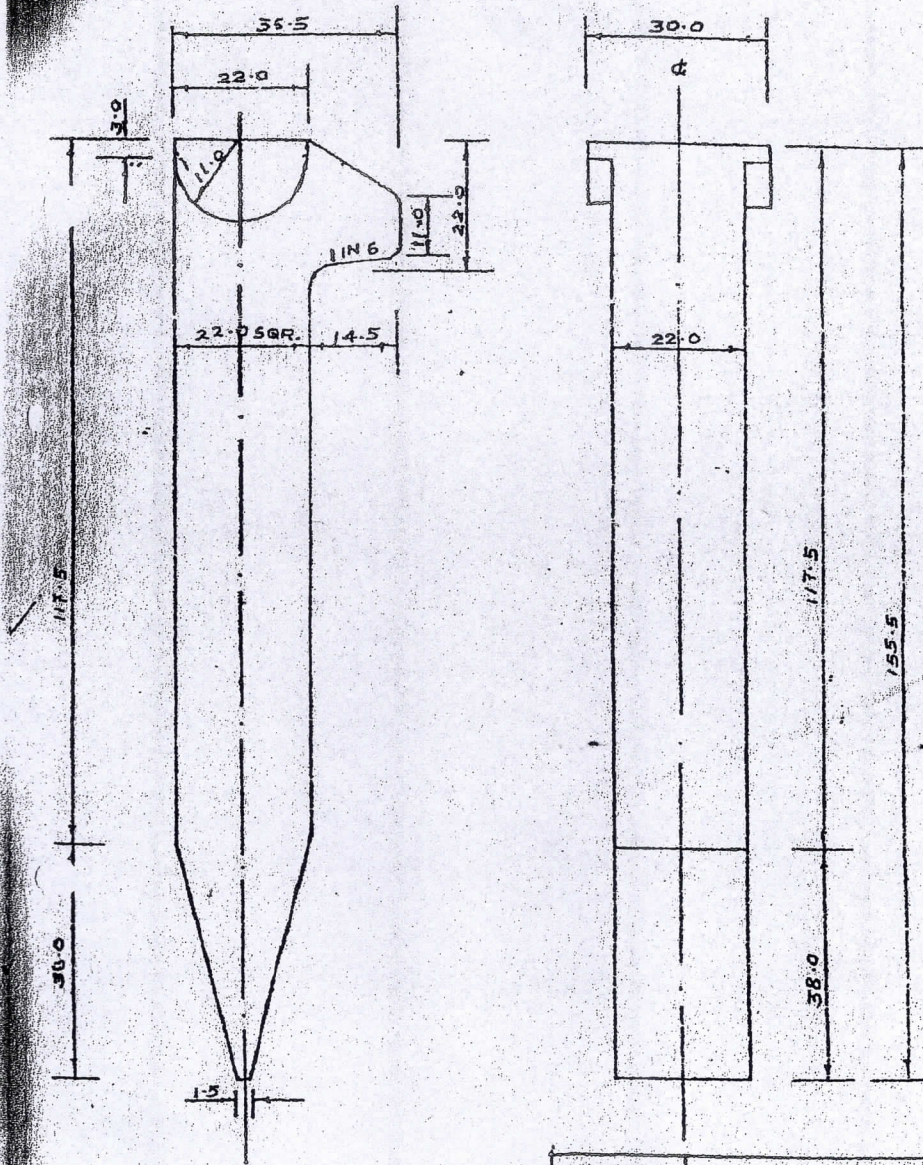
A certification of conformity shall be supplied with each consignment confirming that the products meet the requirements of this SLR specifications and drawing.

DRG NO. 14812/A

Date: 2003-08-19

WGC SPIKE FOR 88 Lbs RAIL.

Scale: Full Size in M.M.



DRAWN BY.	SRI LANKA RAILWAYS.
<i>[Signature]</i>	WAY & WORKS DEPARTMENT

CHECKED BY.

[Signature]

D.O.A

[Signature]

APPR BY.

CHIEF ENGINEER