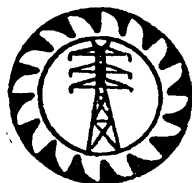


009: 1993

CEB
STANDARD

**UNGALVANIZED “D” BRACKETS SHACKLE STRAPS –
COTTER PINS & SPLIT PINS FOR OVERHEAD LT
DISTRIBUTION LINES**



**CEYLON ELECTRICITY BOARD
SRI LANKA**

Specification

for

***UN GALVANIZED "D" BRACKETS,
SHACKLE STRAPS, COTTER PINS & SPLIT PINS
FOR OVERHEAD LT DISTRIBUTION LINES***

CEB Standard 009: 1993

CEYLON ELECTRICITY BOARD

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CONTENTS

	Page
1. Scope	3
2. Applicable Standards	3
3. Basic Features	3
4. Additional Requirements	5
5. Information to be supplied with the Offer	5
6. Technical Literature and Drawings	5
7. Inspection and Testing	5
8. Sample Study	6
9. Annexure	6

SPECIFICATION FOR UNGALVANIZED "D" BRACKETS, SHACKLE STRAPS, COTTER PINS AND SPLIT PINS FOR OVERHEAD LT DISTRIBUTION LINES

1.0 SCOPE

This specification covers the design manufacture and testing of ungalvanized "D" Brackets Shackle Straps, Cotter Pins and Split Pins for use in the LT overhead power line system of the CEB. These items shall be suitable for hot dip galvanizing.

2.0 APPLICABLE STANDARDS

The items supplied shall be in accordance with the standards specified below or subsequent editions and/or amendments thereof.

- a) B.S 4360 - 1990 Weldable structural steel

The items conforming to any other international standards which are equal to or higher but not less rigid than the standards and specifications stipulated may be offered.

When such alternative standards are used reference to such standards shall be quoted and English Language copies of such standards shall be furnished with the offer.

3.0 BASIC FEATURES

3.1 General

3.1.1 Quality

The material shall be sound and free from any internal and external defects or surface flaws which might preclude its use for the purpose for which it is intended.

3.1.2 Grade of steel

The steel used for fabricating "D" Brackets, Shackle Straps and Cotter Pins shall be of grade 43E or WR50B and their chemical composition shall be as given in table 16 or 20 of BS 4360 as applicable.

3.1.3 Mechanical properties

The minimum Tensile Strength, Yield Strength and Elongation of the Steel used for the fabricating "D" Brackets, Shackle Straps and Cotter Pins shall be as given in table 17 or 21 of BS 4360 as applicable.

3.2 Design

The design of the "D" Brackets, Shackle Straps, Cotter Pins and Split Pins shall be suitable for use with 90 mm dia. Insulators and the dimensions shall be as indicated in the Drawing No. DS/93/7606.

3.2.1 "D" Brackets

"D" Brackets shall be made out of 30 mm x 6 mm. Flat Iron bent at 90° as shown in Drawing No. DS/93/7606. The holes on the "D" Brackets shall be of 19 mm dia. so that after galvanizing it shall allow a 16mm diameter cotter pin/bolt to pass through. The three sides of the "D" Bracket shall not be twisted and the cotter pin holes shall be in perfect alignment to enable the easy insertion of cotter pin/bolt.

3.2.2 Shackle Straps

Shackle Straps shall be made out of 30 mm x 6mm. Flat Iron according to drawing No.DS/93/7606. The holes on the shackle straps shall be 19mm dial. so that after galvanizing it shall allow 16 mm dia. cotter pin/bolt to pass through.

3.2.3 Cotter Pins

Cotter Pins shall be of 16 mm dia. and 135 mm long suitable for use with "D Brackets and Shackle Straps as Insulator Pins in place of Insulator Bolts. It shall have a hexagonal/square/round head on the top and a 5mm hole at the bottom suitable for inserting the split pin specified in Clause 3.2.4, after galvanizing, as per attached Drawing No. DS/93/7606.

3.2.4 Split Pins

Split Pins shall be 35 mm long, made of stainless steel or phosphor bronze, suitable for use with cotter pin specified in Clause 3.2.3 and as per attached Drawing No. DS/93/7606.

3.2.5 Finish

There shall be on sharp edges, and corners rounded. All burrs shall be removed after shearing, drilling or punching and bending are completed. The cut ends of the "D" Brackets and Shackle Straps shall be rounded off.

All items shall be clean, rust free, smooth and uniform throughout and shall also be free from burrs. All items, except split pins shall be free from oil, paint and ready for hot dip galvanizing.

4.0 ADDITIONAL REQUIREMENTS

4.1 Markings

Manufacturer's identification marks and the letters "CEB" shall be punched on all "D" Brackets, Shackle Straps and Cotter Pins supplied.

4.1.2 Packing

"D" Brackets/Shackle Straps and Cotter pins shall be separately packed in polythene lined palletised wooden boxes of max. dimensions of 1m x 1m x 1/2m.

Split pins shall be supplied in hardboard or wooden boxes and each box shall contain 100 Nos.

The item and the quantity shall be clearly marked on each box.

5.0 INFORMATION TO BE SUPPLIED WITH THE OFFER

The test certificate indicating the following, and the completed schedule of particulars (ANNEXURE A) shall be furnished with the offer.

- i) Grade of steel
- ii) Percentage elongation

6.0 TECHNICAL LITERATURE AND DRAWINGS

The offer shall be accompanied with the dimensioned drawings of the items offered.

7.0 INSPECTION AND TESTING

The selected Tenderer shall supply sample pieces of steel to be used for the manufacture of items to be supplied if requested by the purchaser prior to the manufacture.

The selected tenderer shall make necessary arrangements for inspection by the representative of the Purchaser, and also to carry out the following tests in his presence if required,.

- (a) Tensile tests
- (b) Elongation tests

In the place of manufacture, one out of 1000 Nos. from each items, will be tested prior to despatch

7.1 Sampling Tests

Each batch of items supplied will be subjected to the following sampling Tests at the place of dispatch:-

1. Checking whether the items are rust, oil and paint free.
2. Checking of the specified dimensions and the correct alignment of the insulator bolt holes including pole bolt holes.
3. Whether the surfaces are smooth and burr free

The above Tests shall be carried out, for 25 Nos. "D" Brackets selected randomly from a batch of 5,000 numbers at the place of dispatch (or at Purchaser's Stores). If two or more numbers of "D" Brackets are found defective then a second Sampling Test shall be carried out on the same basis. If two or more "D" Brackets are also found defective then the whole batch shall be rejected.

8.0 SAMPLE STUDY

Two Samples (non returnable) of each Ten samples of Split Pin and of other item offered shall be furnished with the offer.

9.0 ANNEXURE

A - Schedule of Particulars

SCHEDULE OF PARTICULARS

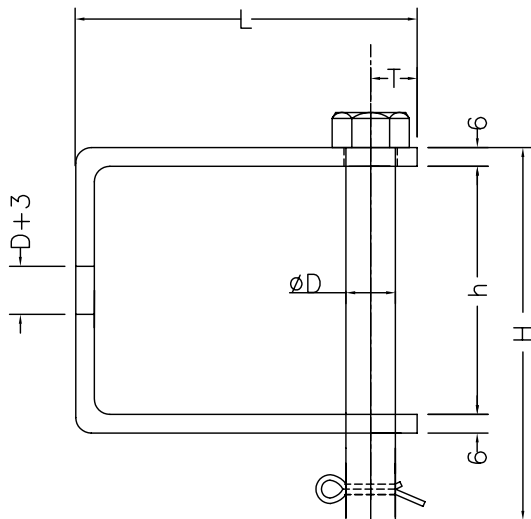
(The following information shall be furnished with the offer.)

- (a) Grade of the Steel used for manufacture of
 - i) "D" Bracket
 - ii) Shackle Straps
 - iii) Cotter Pins

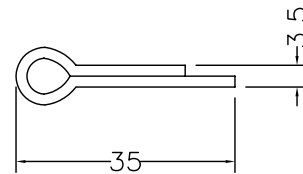
- (b) Minimum Tensile Strength of the Steel used for manufacture of
 - i) "D" Bracket
 - ii) Shackle Straps
 - iii) Cotter Pins

- (c) Minimum Yield Strength of the Steel used for manufacture of
 - i) "D" Bracket
 - ii) Shackle Straps
 - iii) Cotter Pins

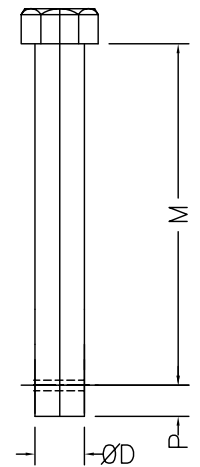
- (d) Minimum Elongation of the Steel used for manufacture of
 - i) "D" Bracket
 - ii) Shackle Straps
 - iii) Cotter Pins



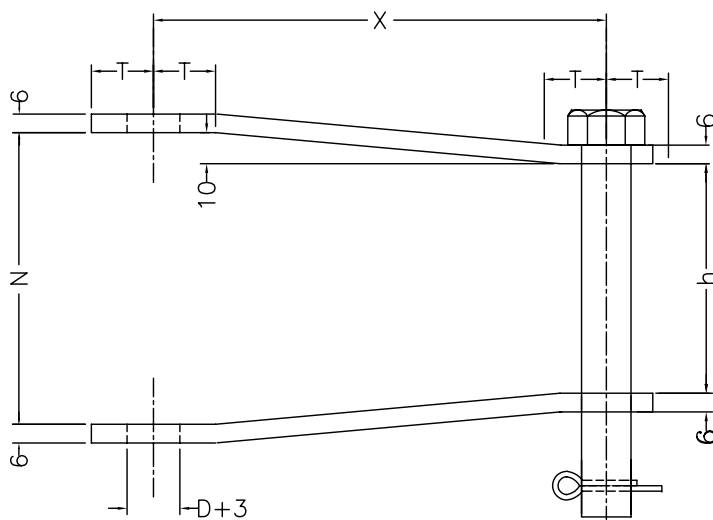
D BRACKET



SPLIT PIN



COTTER PIN



SHACKLE STRAP

* FLAT IRON SIZE 30 x 60
* ALL DIMENSIONS ARE IN mm.

	FOR 63 mm INSULATOR	FOR 90 mm INSULATOR
H	95 ± 2%	120 ± 2%
h	55 ± 2%	80 ± 2%
L	90 ± 2%	110 ± 2%
T	15 ± 2%	20 ± 2%
D	12.5 ± 2%	16 ± 2%
M	85 ± 2%	110 ± 2%
N	75 ± 2%	100 ± 2%
P	10 ± 2%	10 ± 2%
X	143 ± 1%	146 ± 1%



CEYLON
ELECTRICITY
BOARD

DIST. PLANNING BRANCH

DISTRIBUTION STANDARDS & SPECIFICATION

D-Bracket, Split Pin, Cotter Pin & Shackle Strap

DESIGNED BY

CHIEF ENGINEER (DS & S)

APPROVED BY

CHAIRMAN, SPECIFICATION COMMITTEE

SCALE : NOT TO SCALE

DRAWN : LALANI

DATE : Oct. 1997

DRG. NO : DS&S/97/7606

CAD NO :

**Amendment Slip No. 4
Effective from 15th Oct. 1997
To CEB Standard 009: 1993**

**Specification for Ungalvanized 'D' Brackets,
Shackle Straps, Cotter Pins & Split Pins for
Overhead Distribution Lines**

REVISED TEXT

October 1997

1. Clause 2.0 APPLICABLE STANDARDS

To add the following para to the clause;

Tolerance on width and thickness shall be in accordance with SLS 949 Part V - 1992 - Dimensions of Hot Rolled Steel Bars for Structural & General Engineering Purposes.

2. Drawing No. "DS&S/93/7606"

To replace the Drawing bearing No. "D&S/93/7606" by the Drawing bearing No. "**DS&S/97/7606**"

3. To amend "Drawing No. D&S/93/7606" everywhere it appears to read as "**Drawing No. DS&S/97/7606**".

4. Clause NO. 3.0 - Basic Features

To add the following Sub Clause to the end of the above clause.

"3.2.6 - Fabricating Tolerances are indicated in the Drawing bearing No. DS&S/97/7606"

**Amendment Slip No. 3
Effective from 9th August 1994
To CEB Standard 009: 1993**

**Specification for Ungalvanized 'D' Brackets,
Shackle Straps, Cotter Pins & Split Pins for
Overhead Distribution Lines**

REVISED TEXT

Drawing No. DS/93/7606

To amend M to read as 110mm for 90mm insulators and 85mm for 63mm insulators.

**Amendment Slip No. 2
Effective from 01st March 1994
To CEB Standard 009: 1993**

**Specification for Ungalvanized 'D' Brackets,
Shackle Straps, Cotter Pins & Split Pins for
Overhead Distribution Lines**

REVISED TEXT

1. Clause 9.0 - Sample Study

Amend the Clause 9.0 to read as "Two Samples (non returnable) of each item offered shall be furnished with the offer"

**Amendment Slip No. 1
Effective from 18th Oct 1993
To CEB Standard 009: 1993**

**Specification for Ungalvanized 'D' Brackets,
Shackle Straps, Cotter Pins & Split Pins for
Overhead Distribution Lines**

REVISED TEXT

October 1993

Drawing No. DS/93/7606

To amend H (length of the Cotter Pin) to read as 120 mm for 90mm insulators and 95mm for 63 mm insulators.

