Specification

for

CONDUCTOR AND INSULATOR HARDWARE FITTINGS FOR MEDIUM VOLTAGE OVERHEAD POWER LINES

CEB Standard 056 : 1997

CEYLON ELECTRICITY BOARD

No. 50, Sir Chittampalam A. Gardiner Mawatha, Colombo 2.
Sri Lanka

Telephone: 324471-8 Telex : 21368 CE Facsimile: 94-1-449572

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SPECIFICATION FOR CONDUCTOR AND INSULATOR HARDWARE FITTINGS FOR MEDIUM VOLTAGE OVERHEAD POWER LINES

1.0 SCOPE

This Specification covers general requirements of the design, manufacture and testing of the following Conductor and Insulator Hardware Fittings for Medium Voltage Overhead Power Lines.

DEAD-END (Tension) CLAMP ASSEMBLY for;

- **i) Galvanized Stranded Steel Earth Conductor (GSEC)**
- **ii) Aluminium Conductor Steel Reinforced (ACSR)**
- **iii) All Aluminium Alloy Conductor (AAAC)**
- **iv) All Aluminium Conductor (AAC)**

b) SUSPENSION (Non-tension) CLAMP ASSEMBLY for;

- **i) Galvanized Stranded Steel Earth Conductor (GSEC)**
- **ii) Aluminium Conductor Steel Reinforced (ACSR)**
- **iii) All Aluminium Alloy Conductor (AAAC)**
- **iv) All Aluminium Conductor (AAC)**

c) MID-SPAN (Tension) JOINTING FERRULES for;

- **i) Galvanized Stranded Steel Earth Conductor (GSEC)**
- **ii) Aluminium Conductor Steel Reinforced (ACSR)**
- **iii) All Aluminium Alloy Conductor (AAAC)**
- **iv) All Aluminium Conductor (AAC)**

d) SOCKETS (Lugs) for;

- **i) Galvanized Stranded Steel Earth Conductor (GSEC)**
- **ii) Aluminium Conductor Steel Reinforced (ACSR)**
- **iii) All Aluminium Alloy Conductor (AAAC)**
- **iv) All Aluminium Conductor (AAC)**

e) CONDUCTOR REPAIR SLEEVES for.

- **i) Aluminium Conductor Steel Reinforced (ACSR).**
- **ii) All Aluminium Alloy Conductor (AAAC).**
- **iii) All Aluminium Conductor (AAC).**

f) VIBRATION DAMPERS.

g) ARMOUR RODS.

h) FLEXIBLE EARTH CONDUCTOR BONDING WIRE.

i) STRANDED COPPER CONDUCTOR.

j) SOLID COPPER CONDUCTOR.

k) SOCKETS (Lugs) for Copper Conductor.

l) BULLDOG CLAMP.

m) GALVANIZES STEEL EARTH RODS.

2.0 SERVICE CONDITIONS

a)	Annual average ambient temperature	-	30°C.
b)	Maximum ambient temperature	-	40°C.
c)	Maximum relative humidity	-	90%.
d)	Environmental condition atmosphere.	-	Humid tropical climate with polluted

3.0 APPLICABLE STANDARDS

The items and components supplied shall be in accordance with the standard specified below or later editions and/or amendments thereof.

a)	BS 3288 Part 1 (1993) Part 2 (1990) Part 3 (1989) Part 4 (1984)	-	Insulator and Conductor Fittings for overhead Power Lines.
b)	BS 4579 Part 1 (1988) Part 3 (1988)	-	Performance of Mechanical and Compression Joints in Electric Cable Wire and Connectors.
c)	BS 729 (1979) Articles.	-	Hot Dip Galvanized Coatings on Iron and Steel

4.0 BASIC FEATURES

All items will be in service in a damp tropical saliferous climate. The design shall avoid sharp corners or projections which would produce high electrical stress in normal working condition. The design of adjacent metal parts and mating surfaces shall be such as to prevent corrosion of the contact surface and to maintain good electrical contact under all service condition.

The Conductor and Insulator Hardware Fittings shall be designed for a short circuit current of 10kA for a duration of one second without damaging component parts or welding between them. The Compression Clamps and sockets for line conductors shall be suitable for operating at a temperature not less than 75°C.

All item shall be suitable for hot line maintenance and all corresponding parts to be made to gauge and be interchangeable.

a) Oxide Inhibiting Grease/Compound

The internal faces of aluminium fittings shall be coated with Oxide Inhibiting Grease/ Compound to improve electrical contact and ensure maximum electrical performance of fittings.

In the case of two part fittings i.e. those with separate aluminium and steel tube (Mid Span Jointing Sleeve) where this is impracticable adequate means shall be taken to protect the fitting from corrosion. The quantity of grease shall be sufficient when used on smallest conductor for which it is designed and tube ends should be protectively capped to prevent spoilage and spillage of the grease.

The Grease/Compound shall contain suspended particles to penetrate the oxide film present on aluminium surfaces and shall ensure maximum electrical performance of compression fittings.

Full details of the type of Grease/Compound used, and documents in proof of tests carried out for compatibility shall be furnished.

b) Compression Dies

The dies to be used for Compression shall be compatible with the Berndy type.

4.1 DEAD-END (TENSION) CLAMP ASSEMBLY FOR GSEC/ACSR/AAAC/AAC.

The Dead-End Clamp Assembly shall be of compression type and shall be suitable for terminating the Aluminium Conductor Steel Reinforced (ACSR) / All Aluminium Alloy Conductor (AAAC) / Galvanised Stranded Steel Earth Conductor (GSEC) / ALL Aluminium Conductor (AAC) at the terminal, angle and section towers as shown in the drawing.

The Dead-end Clamp Assembly shall have the following components ;

a) Conductor Dead-end compression clamp
b) Anchor ("U") Shackle
c) Horn Holder Socket Eye for ACSR/AAAC

The conductor dead -end compression clamp shall be suitable for correctly accommodating GSEC/ACSR/AAAC/AAC indicated in the schedule of prices. It shall incorporate a palm to match the Jumper Socket as per Clause 4.4 below and an eye hole for anchoring the Dead End Clamp Assembly.

The ultimate tensile strength (UTS) of the Dead-end Clamp Assembly shall not be less than the UTS of the relevant conductor as specified in Table 1 below. The conductor dead-end clamp after crimp jointing, shall not permit slipping or cause damage to or failure at a load less than 95% of the ultimate tensile strength of the relevant conductor.

Necessary bolts and nuts round washers and spring washers shall also be provided.

The Across flat dimensions of the die to be used for making compression type Dead-end joint, required number of crimps and the direction of crimping shall be marked on the Dead-end Clamp.

All Steel components except stainless steel ones of the dead end clamp assembly shall be hot dip galvanised conforming to BS 729 and to the Clause 4.12 below.

The Dead End Clamp Assembly shall be marked and packed as per Clause 5.0 below.

4.1.1 Dead End Clamp Assembly for GSEC

The palm of the Dead End Clamp for Galvanized Stranded Steel Earth Conductor shall have a hole to accommodate a 16mm bolt and shall match the palm of the steel (jumper) socket as specified in Clause 4.4.1 below.

Two numbers of Anchor ("U") Shackles with 16mm cotter pins and split pins shall be provided to anchor the dead end clamp assembly to the body of the steel tower as shown in the **Drawing No. DS&S/056/1/97**.

The conductor dead-end clamp and split pin shall be made of stainless steel, the "U" shackles shall be made of forged steel and cotter pins shall be made of steel.

4.1.2 Dead End Clamp Assembly for ACSR/AAAC/AAC

The palm of the dead end clamp for line conductor (ACSR/AAAC/AAC) shall have two holes to accommodate 12mm bolts and shall match the palm of the aluminium (jumper) socket as specified in Clause 4.4.2 below.

One number of Anchor ("U") Shackle with 16mm cotter pins & split pins, and a Horn Holder Socket Eye shall be provided to anchor the Line Conductor (ACSR/AAAC) dead end clamp to the tension insulator Ball Pin, as shown in the **Drawing No. DS&S/056/2/97.**

The Conductor Dead-end Clamp and Horn Holder Socket Eye shall be made of aluminium alloy / steel, split pin shall be made of stainless steel, the Anchor ("U") shackles shall be made of forged steel and cotter pins shall be made of steel.

4.1.3 The Tension Insulator String Hardware Fittings

The following Insulator String Hardware Fittings shall be provided to anchor the Tension Insulator String to the terminal, angle and section tower cross-arm.

a) Ball Eye
b) Anchor "U" Shackle

The Ball Eye shall be suitable to be used with the type of the Tension Insulator indicated in the Drawing and Table 1.

The ultimate tensile strength of the Ball Eye and Anchor Shackle shall not be less than that of the relevant tension insulator .

The Ball Eye shall be made of forged steel or aluminium alloy, the Anchor Shackle and Cotter pin shall be made of forged steel and Split pin shall be made of stainless steel.

4.2 SUSPENSION CLAMP ASSEMBLY FOR GSEC/ACSR/AAAC/AAC

The Suspension (non tension) Clamp Assembly shall be suitable for accommodating the conductor (GSEC/ACSR/AAAC/AAC) as indicated in the schedule of prices.

The ultimate tensile strength of the Suspension Clamp Assembly shall not be less than that of the conductor and the suspension clamp shall not allow the Conductor (GSEC/ ACSR/AAAC/AAC) to slip up to a load of 85% of the Ultimate Tensile strength of the relevant conductor.

Necessary lock nuts, round washers and spring washers shall also be provided.

All Steel components of the suspension clamp assembly shall be hot dip galvanised conforming to BS 729 and to the Clause 4.12 below.

The Suspension Clamp Assembly shall be marked and packed as per Clause 5.0 below.

4.2.1 Suspension Clamp Assembly for GSEC

The suspension clamps Assembly for Galvanized Stranded Steel Earth Conductor shall be of two types **" Type A"** and " **Type B** " according the method of mounting on the top of the tower as shown in the relevant drawings.

4.2.1.1 Suspension Clamp Assembly " Type A " for GSEC

The Suspension Clamp Assembly of **"Type A"** shall be suitable for mounting on the bottom side of the tower top plate as shown in the **Drawing No. DS&S/056/3/97**. It shall have the following components;

a) Conductor Clamp

b) "U" Bolt and nuts

c) Cotter Pin with Split Pin

The conductor clamp shall have a groove suitable for correctly accommodating the Galvanised Stranded Steel Earth Conductor indicated in the schedule of prices. A suitable keeper with two U bolts & nuts shall be provided with the conductor clamp for effectively clamping the earth conductor. The grooves shall be bell-mouthed at each end.

The conductor clamp shall be coupled to the U bolt using 16mm steel cotter pin with stainless steel split pin. The U bolt will be fixed to the bottom side of the tower top plate.

The conductor clamp and the keeper shall be made of forged steel or forged aluminium alloy and the "U"bolts shall be made of forged steel.

4.2.1.2 Suspension Clamp Assembly " Type B " for GSEC

The suspension clamp assembly of "Type B" shall be suitable for mounting on the Upper side of the tower top plate as shown in the **Drawing No. DS&S/056/4/97**. It shall have the following components;

a) Conductor Clamp
b) Mounting Bracket
c) Cotter Pin with Split Pin

The conductor clamp shall have a groove suitable for correctly accommodating the galvanised stranded steel earth conductor indicated in the schedule of prices. A suitable Keeper and two U bolts shall be provided with the clamp for effectively clamping the earth conductor. The grooves shall be bell-mouthed at each end.

The conductor clamp shall be coupled to the mounting bracket using 16mm steel cotter pin with stainless steel split pin. Four holes with 16 x35 mm Steel Blots &nuts shall be provided to mount the bracket on the upper side of the tower top plate.

The conductor clamp and the keeper shall be made of forged steel or forged aluminium alloy, the U bolts shall be made of forged steel and the mounting bracket shall be made of steel.

4.2.2 Suspension Clamp Assembly for ACSR/AAAC/AAC

The suspension clamp assembly shall be used to clamp the Line Conductor (ACSR/AAAC/AAC) to the suspension insulator string as indicated in the **Drawing No. DS&S/056/5/97**. It shall have the following components;

a) Conductor Suspension Clamp
b) Socket Eye
c) "U" Bolt and nut
d) Cotter Pin with Split Pin

The conductor suspension clamp shall have a groove suitable for correctly accommodating the Line Conductor (ACSR/AAAC/AAC) indicated in the schedule of prices. A suitable Keeper and two U bolts &nuts shall be provided with the clamp for effectively clamping the conductor. The grooves shall be bell-mouthed at each end.

The conductor suspension clamp shall be coupled to the Ball Pin of the suspension insulator using the Socket Eye with a cotter pin and split pin, as indicated in the drawing No DS&S/056/5/97. The Socket Eye shall be suitable to be used with the Ball Pin of size as indicated in the Table 1.

The conductor clamp, keeper and socket eye shall be made of forged steel or forged aluminium alloy, the U Bolts and the Cotter Pin shall be made of forged steel and the Split pin shall be made of Stainless Steel or Phosphor Bronze.

4.2.2.1 The suspension insulator string Hardware accessories

The following Hardware Accessories shall be used to mounted the Suspension Insulator String to the intermediate tower cross-arm as indicated in the drawing No. DS&S/056/5/96.

a) Ball Eye
b) "U" Bolt

The size of the Ball Eye shall be suitable to be used with the type of the Suspension Insulator (70 UBL) indicated in the Drawing and Table 1.

The Ball Eye shall be made of forged steel or aluminium alloy and the "U" Bolt shall be made of forged steel.

Necessary Nuts ,lock nuts and washers shall also be provided with the "U" Bolt.

4.3 MID SPAN JOINTING SLEEVES FOR GSEC/ACSR/AAAC/AAC

The Mid Span Jointing Sleeves shall be of the full tension type suitable for compression jointing GSEC/ACSR/AAAC/AAC.

Tension Joints when made out of crimping sleeves, shall not permit slipping or cause damage to or failure at a load less than 95% of the ultimate tensile strength of the relevant conductor. The number of crimp shall not be less than six.

The electrical conductivity and the current carrying capacity of the jointing sleeves shall not be less than those of the equivalent length of the relevant conductor (GSEC /ACSR/AAAC/AAC).

The Across flat dimensions of the die to be used for making compression joint, required number of crimps and the direction of crimp shall be indelibly marked on the jointing sleeve.

The Mid Span Jointing Sleeves shall be marked and packed as per Clause 5.0 below.

4.3.1 Mid Span Jointing Sleeves For GSEC.

The Mid Span Jointing Sleeves for Galvanized Stranded Steel Earth Conductor shall be made of stainless steel and shall be provided with a centre stop for correctly positioning the steel earth conductor before crimping.

4.3.2 Mid Span Jointing Sleeves For ACSR

The Mid Span Jointing Sleeves for ACSR with single Steel wire shall either be a single part fitting of approved type aluminium alloy or a two part fitting of approved type aluminium and steel.

The Mid Span Jointing Sleeves for ACSR with multi-strand Steel wire shall be a two part fitting of approved type aluminium and steel ad the steel sleeve shall be provided with a centre stop for correctly positioning the steel wire before crimping.

The single part fitting made of Aluminium Alloy shall be provided with a centre stop for correctly positioning the conductor before crimping.

4.3.3 Mid Span Jointing Sleeves For AAAC/AAC.

The Mid Span Jointing Sleeve for AAAC/AAC shall be a single part fitting of approved type aluminium alloy ad shall be provided with a centre stop for correctly positioning the conductor before crimping.

4.4 SOCKETS (LUGS) FOR GSEC/ACSR/AAAC/AAC

The sockets shall be of used for making jumper connection. They shall be of compression type suitable for crimp jointing to the conductor (GSEC/ACSR/AAAC /AAC) indicated in the schedule of prices. The Sockets shall comply with relevant British Standard specified or equivalent.

The sockets for line conductors (ACSR/AAAC/AAC) shall be made of Aluminium as indicated in the drawing No. DS&S/056/2/97 and socket for steel for earth conductor (GSEC) shall be made of galvanized steel. The steel socket shall be hot dipped galvanised conforming to BS 729 and the clause 4.12 below.

The barrel of the socket shall be suitable for accommodating the conductor as indicated in the schedule of prices.

The current carrying capacity of the socket shall not be less than that of the relevant conductor. The minimum number of crimps shall be two.

The Across flat dimensions of the die to be used for making compression joint and the required number of crimps shall be indelibly marked on the Socket.

The Sockets (Lugs) shall be marked and packed as per Clause 5.0 below.

4.4.1 Steel Sockets for GSEC

The Steel sockets shall be used for making jumper connections and the palm of the socket shall have a hole with 16 mm steel bolts and nut for making jumper connection between earth conductor dead end clamp and the tower body. The palm of the steel socket shall match the palm of the earth conductor dead end clamp as specified in Clause 4.1.1 above.

4.4.2 Aluminium Sockets for ACSR/AAAC/AAC

The aluminium sockets shall be used for making jumper connections and the palm shall have two holes with two 12 mm steel bolts and nuts for making jumper connection between conductor dead end clamps. The palm of the aluminium socket shall match the palm of the line conductor dead end clamp as specified in Clause 4.1.2 above.

4.5 CONDUCTOR REPAIR SLEEVES FOR ACSR/AAAC/AAC

The repair sleeve shall be suitable for the application over the damaged surface of the conductor (ACSR/AAAC/AAC) to be repaired. The repair Sleeve shall either be a single piece type or two piece type (which includes keeper portion) to suit the conductor to be repaired.

The conductor types, sizes and "Across Flat Dimensions" of the dies to be used is given in table 1 below.

4.6 VIBRATION DAMPERS FOR GSEC/ACSR/AAAC

The Vibration Dampers shall be of the Stockbridge pattern suitable for fixing to the line/earth conductors (ie. ACSR/AAAC/GSEC) as requested in the schedule of prices) conductor suspension and tension points.

The clamping arrangement of the Vibration damper shall be suitable for fixing to the conductor without damaging the conductor. Clamping bolts shall be provided with domed self-locking nuts designed to prevent corrosion of the threads. The Vibration Dampers shall be suitable for maintenance under hot line working conditions.

The design and the manufacture of Vibration Damper shall be such as to ensure freedom from subsequent droop of the "bells" in service.

All steel components of the Vibration Dampers shall be hot dip galvanised conforming to BS 729 and to the Clause 4.12 below.

The Vibration Dampers shall be marked and packed as per Clause 5.0 below.

4.7 ARMOUR RODS FOR ACSR/AAAC/AAC

The Armour rods shall be made of aluminium alloy and shall be helically formed (preformed) type suitable for use with (ACSR/AAAC/AAC) conductors as requested in the schedule of prices.

Armour Rods will be used at the line conductor suspension points containing the higher weight/wind span.

The Armour Rods shall be packed as per Clause 5.0 below.

4.8 FLEXIBLE EARTH CONDUCTOR BONDING WIRE

The flexible Earth Conductor Bonding Wire shall be suitable for effectively bonding the Steel Earth Conductor Suspension/Dead-end Clamp Assembly to the tower body.

It shall be made of braided alloy wire. The length of flexible bonding wire shall not be less than 500 mm .

Both ends of the flexible bonding wire shall be crimped flat to match the palm of the earth conductor tension clamp as specified in Clause 4.1.1 and provided with one or two holes suitable to accommodate 16 mm bolts and nuts.

The current carrying capacity of the earth bonding wire shall not be less than that of relevant Earth Conductor as indicated in the schedule of prices.

The Flexible Earth Bonding Wire shall be marked and packed as per Clause 5.0 below.

4.9 STRANDED COPPER CONDUCTOR

The Bare Stranded Copper Earth Conductor 19/1.53mm shall be made of electrical grade Copper for earthing the substation, Transformer Neutral conductor, Gantry and Terminal equipment. It shall conform to the relevant standard specified.

The stranded copper earth conductor shall be supplied in 100 meter coils, suitably wrapped with (minimum of four layers) Polythene to prevent damage during transport and handling.

Conductor Size	**DC Resistance**
19/1.53mm	Not more than 0.490 ohms/km at 20°C

4.10 SOLID COPPER CONDUCTOR

The Bare Solid Copper Conductor 6mm shall be made of electrical grade Copper for substation connection purposes.It shall conform to the relevant standard specified.

The solid copper conductor shall be supplied in 100 meter coils, suitably wrapped with (minimum of four layers) Polythene to prevent damage during transport and handling.

Conductor Size	**DC Resistance**
6mm (Solid)	Not more than 0.632 ohms/km at 20°C

4.11 SOCKETS (LUGS) FOR COPPER CONDUCTOR

The socket shall be made of electrical grade copper and tinned and shall be suitable for crimp jointing to the copper conductor. It shall conform to the relevant standard specified.

The barrel of the socket shall be suitable for accommodating copper conductor as requested in the Schedule of Prices and the palm of the socket shall be provided with a hole suitable to accommodate a 16 mm brass bolt.

A hole shall be provided in the barrel of the socket to permit quick visual inspection for proper insertion of the stranded copper conductor before crimping.

The current carrying capacity of the copper socket shall not be less than that of the copper conductor to be used with. The temperature rise of the Socket shall not be more than that of the copper conductor. The minimum number of crimps shall be two.

The Across flat dimensions of the die to be used for making compression joint and the required number of crimps shall be indelibly marked on the Tinned Copper Socket.

The Copper Sockets (Lugs) shall be marked and packed as per Clause 5.0 below.

4.12 BULLDOG CLAMP

The Bulldog Clamp shall be made of forged steel suitable for effectively clamping Galvanised Stranded Steel Earth Conductors of equal/unequal sizes on any combination ie. from 50mm² to 100mm² as indicated in the Drawing No. DS&S/056/6/97.

Necessary lock nuts, spring washers and round washers shall also be provided.

The steel Bulldog Clamp shall be hot dipped galvanised conforming to BS 729 and the clause 4.12 below.

The Steel Bulldog Clamp shall be marked and packed as per Clause 5.0 below.

4.13 GALVANIZED STEEL EARTH ROD

The galvanized steel earth rod will be used for earthing steel towers. One end of the steel earth rod shall have a driving tip to facilitate easy driving of the earth rod to the earth and the other end provided with a steel clamp suitable for clamping stranded galvanized steel earth conductor of diameter from 8mm to 15mm as shown in the Drawing No. DS&S/056/7/97.

The diameter of the Earth Rod shall not be less than 16mm and the length shall not be less than 1.5m.

The Earth Rod shall be hot dip galvanized conforming to the standard specified and as stipulated in Clause 4.13 below .

The Earth Rods shall be marked and packed as per Clause 5.0 Below.

4.14 GALVANISING

All iron and steel components shall be galvanised after all sawing, shearing, drilling, punching, bending and machining is completed.

The zinc coating shall be uniform,clean, smooth and as free from spangle as possible. All components shall be treated with Sodium Dichromate or Preton W20 solution after galvanising to prevent the formation of white rust.

Galvanising shall be applied by the hot dip process and, all parts shall consist of a coating of at least 610 grammes of zinc per square metre of surface and be not less than 0.086mm in thickness, and shall withstand the tests set out in BS 729.

The preparation for galvanising and the galvanising itself shall not distort or adversely affect the mechanical properties of the material. after galvanising , holes shall be free from nodules of spelter.

4.15 WORKMANSHIP

High quality Workmanship shall be maintained in the process of manufacture of Hardware Accessories for Medium Voltage Overhead Tower Lines. All items shall have a good finish and shall be smooth and free from abrasion.

They shall be free from sharp edges, burs and swarf. The contact surface shall be uniform to provide effective contact with the conductors.

5.0 ADDITIONAL REQUIREMENTS

5.1 Markings

All items shall be indelibly marked with the following information as applicable and Steel Items shall be marked before galvanizing.

a) Manufacturer's identification mark.
b) The limit of compression and individual compression positions
c) Size (range of size) of conductor (GSEC/ACSR/AAAC/AAC) applicable.
d) Die reference (Across Flat Dimensions of the dies applicable).
e) Number of Crimp and the Direction of Crimping (the end at which each compression shall be commenced)

5.2 Packing

Each Hardware component for overhead Tower Lines shall be packed in suitable wooden boxes and the packing cases shall be strongly constructed and in no case shall timber less than 25mm in thickness be used and they shall be suitable for rough handling. The method adopted shall provided mechanical and corrosion protection to the contact surfaces in transit and storage. The packaging shall be such as to permit easy identification of items without their removal.

All packages shall be marked with the batch number or code number of the hardware accessories therein.

Each package shall contain a packing list in a water proof envelope. The quantity of items in each package shall be as indicated below.

Components of subset of hardware accessories which are not subject to factory assembly shall be secured and packed together as complete fittings before dispatched.

a) Dead-end Clamp Assembly for GSEC/ACSR/AAAC/AAC.

Each type of Dead-end Clamp Assemblies as requested in the schedule of prices shall be packed separately in wooden boxes. Each box shall contain 50 numbers of Dead-End Clamp Assemblies and the boxes shall be labelled as per Clause 5.2.1 below.

b) Suspension Clamp Assembly for GSEC/ACSR/AAAC/AAC.

Each type of Suspension Clamp Assemblies as requested in the schedule of prices shall be packed separately in wooden boxes. Each box shall contain 50 Nos of Suspension Clamp Assemblies the boxes shall be labelled as per Clause 5.2.1 below.

c) Mid Span Jointing Sleeves for GAEC/ACSR/AAAC/AAC.

Each type of Mid Span jointing Sleeves as requested in the schedule of prices shall be packed separately in Wooden boxes. Each box shall contain 100 numbers of Mid-Span Jointing Sleeves and the boxes shall be labelled as per Clause 5.2.1 below.

d) Sockets (Lugs) for GSEC/ACSR/AAAC/AAC.

Each type of Sockets (lugs) as requested in the schedule of prices shall be suitably packed in wooden boxes. Each box shall contain 100 numbers of Sockets and the boxes shall be labelled as per Clause 5.2.1 below.

e) Conductor Repair Sleeves for ACSR/AAAC and AAC

Each type Conductor Repair Sleeves as requested in the schedule of prices shall be suitably packed in wooden boxes. Each box shall contain 100 numbers of conductor Repair Sleeve and the box shall be labelled as per Clause 5.2.1 below.

f) Vibration Dampers for GSEC/ACSR/AAAC/AAC.

Each type of Vibration Dampers as requested in the Schedule of Prices shall be suitably packed in wooden box. Each box shall contain 50 numbers of Vibration Dampers and the box shall be labelled as per Clause 5.2.1 below.

g) Armour Rods for ACSR/AAAC and AAC

Each type of Armour Rods as requested in the Schedule of Prices shall be suitably packed in wooden boxes. Each box shall contain 100 Numbers of Armour Rods and the box shall be labelled as per Clause 5.2.1 below.

h) Flexible Earth Conductor Bonding Wire

The Flexible Earth Conductor Bonding wire as requested in the Schedule of Prices shall be packed in wooden box. Each box shall contain 50 numbers and the box shall be labelled as per Clause 5.2.1 below.

i) Stranded Copper Conductor

The Stranded Copper Conductor of size as requested in the Schedule of Prices shall be supplied in 100 meter coils, suitably wrapped with four layers of Polythene to prevent damage during transport and handling and each coil shall be labelled as per Clause 5.2.1 below.

j) Solid Copper Conductor

The Solid Copper Conductor shall of size as requested in the Schedule of Prices shall be supplied in 100 meter coils, suitably wrapped with four layers of Polythene to prevent damage during transport and handling and each coil shall be labelled as per Clause 5.2.1 below.

k) Sockets (Lugs) for Copper Conductor

Sockets (lugs) for Copper Conductor of size as requested in the Schedule of Prices shall be suitably packed in wooden boxes. Each box shall contain 100 numbers of Sockets and the box shall be labelled as per Clause 5.2.1 below.

l) Bulldog Clamp

The Bulldog Clamps shall be packed in wooden boxes and each box shall contain 100 Nos of Bulldog Clamp. Each box shall be labelled as per Clause 5.2.1 below.

m) Galvanized Steel Earth Rods

The Galvanized Steel Earth Rods shall be packed in wooden boxes and each box shall contain 50 numbers of Earth Rods. Each box shall be labelled as per Clause 5.2.1 below.

5.2.1 Labelling

The following information shall be visibly marked on each package;

a) Name of manufacturer and country of origin.

b) Name of item.

c) Quantity

d) Nett weight

e) Gross weight.

f) Type and Size of Conductor as applicable

6.0 INFORMATION TO BE SUPPLIED WITH THE OFFER

The following information shall be furnished with the offer;

a) Catalogues indicating the model or reference number of the items offered.

b) Constructional features and dimensional drawing

c) Type of Material used in the construction of each component.

d) Completed Schedule of Particulars, Annexure A

e) Certificates of type tests, for the following, carried out in accordance with the specified standard, by a recognised independent testing authority acceptable to the Purchaser.

i) For Steel Components, as applicable

1) Ultimate Tensile Strength

2) Galvanizing

ii) For Aluminium Components, as applicable

1) Ultimate Tensile Strength

2) D.C. Resistance

3) Temperature rise

i) For Copper component, as applicable

1) D.C. Resistance

2) Temperature rise

Failure to furnish the above particulars and the sample as per clause 7.0 will result in the offer being rejected.

7.0 SAMPLE STUDY

A Sample (non-returnable) of each item offered shall accompany the Bid to facilitate analysis and evaluation.

8.0 INSPECTION & TESTING

8.1 Inspection

The selected Bidder shall make arrangements for inspection by an Engineer appointed by the Purchaser during manufacture and before despatch and also to carry out in his presence necessary Acceptance/ Sample tests of the materials offered.

8.2 Sampling

Items packed as per Clause 5.2 shall be stored in such a manner that all packages shall be visible and accessible to the CEB inspector to carry out random sampling easily as given below.

Five samples will be selected from a batch of 1000 Nos. to carry out Acceptance /Sample Tests as given below.

8.3 Acceptance /Sample Tests

The following Acceptance/Sample Tests as applicable, conforming to BS 2627 and BS 215 (Part 1) shall be witnessed by the authorised representative of the CEB.

a. Visual inspection and Verification of Dimensions

b. Mechanical Test

c. Electrical Tests (DC. Resistance Test).

d. Heating Cycle Test (Temperature rise test).

e. Galvanizing Test.

9.0 TECHNICAL LITERATURE AND DRAWINGS

9.1 All relevant Drawings, Technical Literature, Product Catalogues, Routine Test Reports etc. shall be supplied with the item.

9.2 The Bidder shall submit the erection details and maintenance instruction with each item.

9.3 These documents constitute a part of the item supplied and shall be listed with the item supplied to make sure that the documents is shipped along with each item.

9.4 The drawings and diagrams, may be reduced to a convenient size, should be bound into the volume and not inserted into cover pockets.

10.0 ANNEXURE

A-1 Drawing No. DS&S/056/1/97 Dead-end (Tension) Clamp Assembly for Earth Conductor.

A-2 Drawing No. DS&S/056/2/97 Dead-end (Tension) Clamp Assembly for Line Conductors.

A-3 Drawing No. DS&S/056/3/97 Suspension Clamp assembly for Earth Conductor " TYPE A".

A-4 Drawing No. DS&S/056/4/97 Suspension Clamp assembly for Earth Conductor " TYPE B".

A-5 Drawing No. DS&S/056/5/97 Suspension Clamp assembly for Line Conductors.

A-6 Drawing No. DS&S/056/6/97 Galvanized Steel Bulldog Clamp.

A-7 Drawing No. DS&S/056/7/97 Galvanized Steel Earth Rod Assembly.

B TABLE 1- Schedule of Technical Particulars

C Schedule of Particulars - To be filled by the Bidder.

C-1 Dead-end Clamp Assembly for GSEC/ACSR/AAAC/AAC

C-2 Suspension Clamp Assembly for GSEC/ACSR/AAAC/AAC

C-3 Mid Span Jointing Sleeves for GSEC/ACSR/AAAC/AAC

C-4 Sockets(Lugs) for GSEC/ACSR/AAAC/AAC

C-5 Conductor Repair Sleeve for ACSR/AAAC/AAC

C-6 Vibration Dampers for GSEC/ACSR/AAAC/AAC

C-7 Armour Rods for ACSR/AAAC/AAC

C-8 Flexible Earth Conductor Bonding Wire

C-9 Stranded Copper Conductor For Earthing (19/1.53mm)

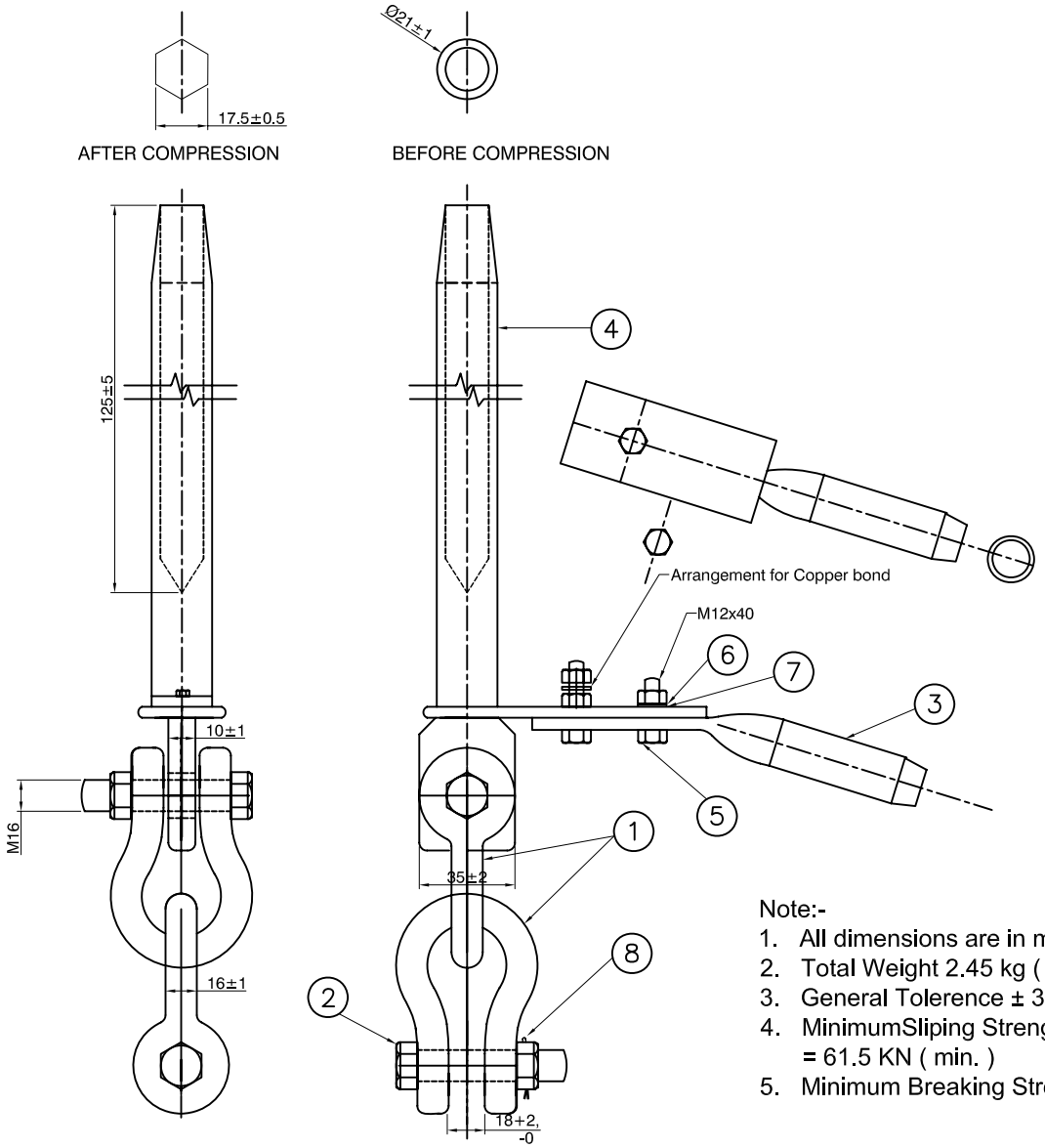
C-10 Solid Copper Conductor

C-11 Sockets (Lugs) for Copper Conductor

C-12 Bulldog Clamp

C-13 Galvanized Steel Earth Rod Assembly

Towers:dead-end

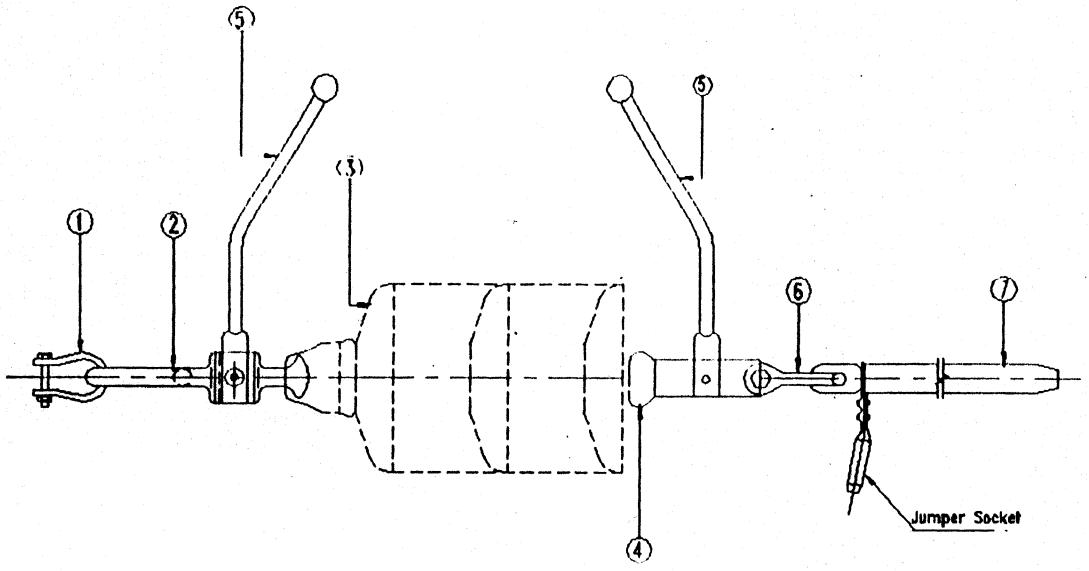


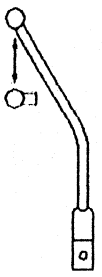
Note:-

1. All dimensions are in mm.
2. Total Weight 2.45 kg (Approx.)
3. General Tolerence ± 3 %
4. MinimumSliping Strength
   = 61.5 KN (min.)
5. Minimum Breaking Strength = 6500 KN

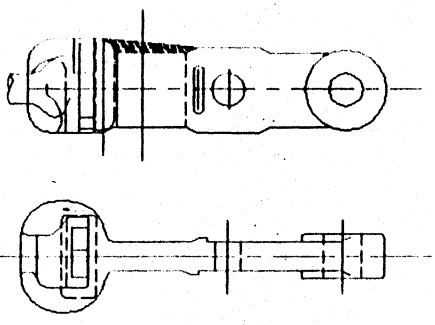
Sr. No.	Description	Material	Qty.
1	Anchor Shackle	forged Steel	2
2	Nut & Bolt (M16)	Steel	2
3	Jumper	Stainlss Steel	1
4	Compression tube	Stainlss Steel	1
5	Nut & Bolt (M16)	Steel	2
6	Spring Washer (M12)	Spring Steel	2
7	Plain Washer (M12 & M16)	Steel	4 , 2
8	Spilt Pin	Stainless Steel	2

CEYLON ELECTRICITY BOARD	DISTRIBUTION STANDARDS & SPECIFICATION	SCALE : NOT TO SCALE
	DAD -END (TENSION) CLAMP ASSEMBLY FOR EARTH WIRE	DRAWN : LALANI
		DATE : Nov. 1998
	DESIGNED BY / APPROVED BY	DRG. NO : DS&S/056/1/98
DIST. PLANNING BRANCH	E.E. (DS & S) / CHAIRMAN, SPECIFICATION COMMITTEE	CAD NO :

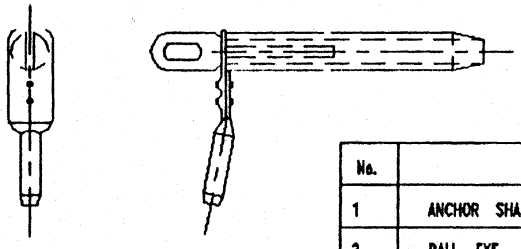




ARCING HORN



HORN HOLDER SOCKET EYE

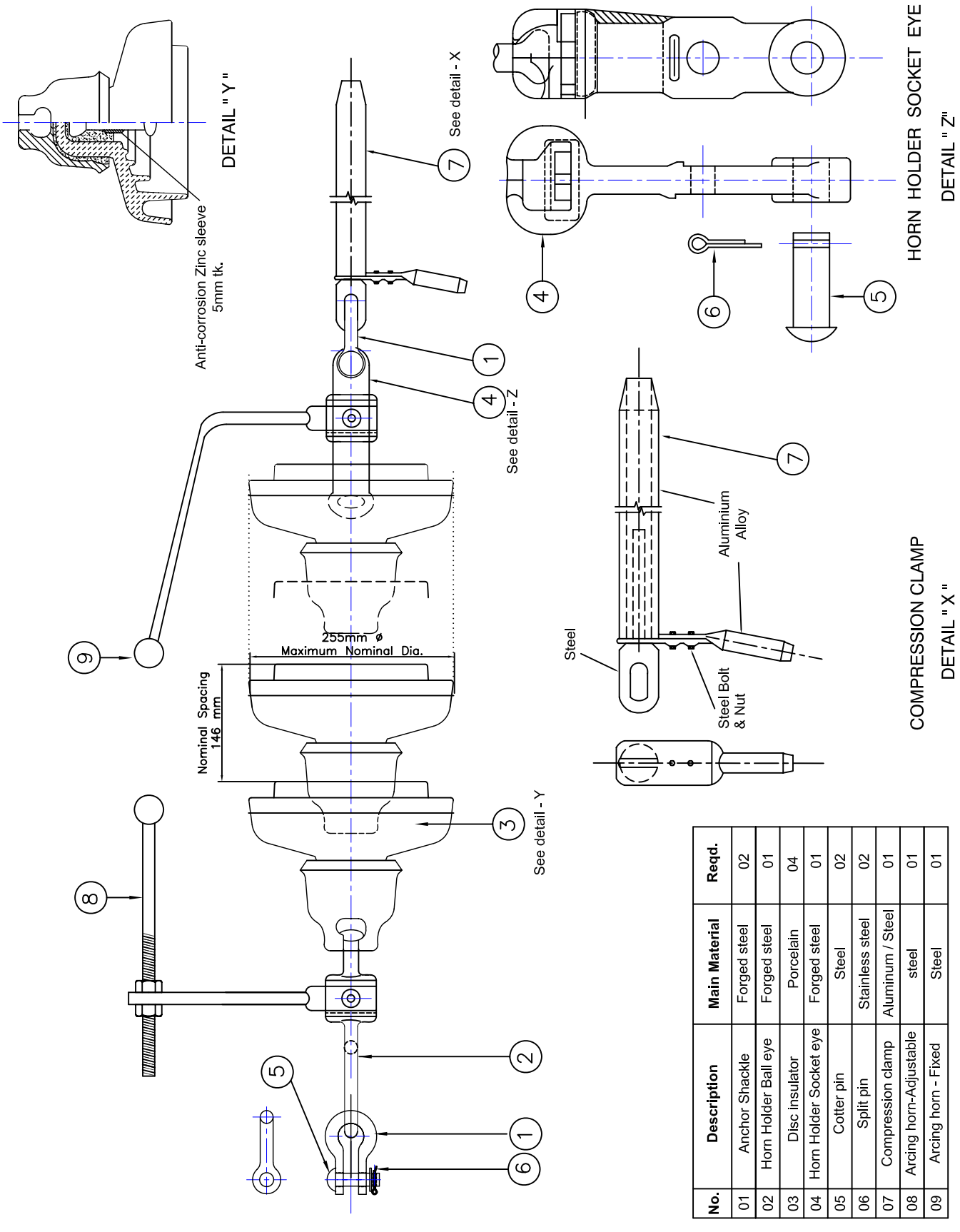


COMPRESSION CLAMP

No.	Description	Main Material	Reqd.
1	ANCHOR SHACKLE	STEEL	01
2	BALL EYE	HIGH TENSION STEEL	01
3	SUSPENSION INSULATOR	PORCELAIN / GLASS	03
4	HORN HOLDER SOCKET EYE	FORGED STEEL	01
5	ARCING HORN	STEEL	01
6	ANCHOR SHACKLE	HIGH TENSION STEEL	01
7	SUSPENSION CLAMP	ALUMINIUM ALLOY	01

All dimensions are in mm.

CEYLON ELECTRICITY BOARD DD BRANCH	DISTRIBUTION STANDARDS & SPECIFICATIONS	SCALE :
	DED-END (TENSION) CLAMP ASSEMBLY FOR LINE CONDUCTORS (ACSR/AAAC/AAC)	DRAWN : Lalani
	DESIGNED E E (DS&S)	APPROVED CHAIRMAN, SPECIFICATION COMMITTEE
		DATE : Mar.'97
		DR NO: DS&S/056/2/97



No.	Description	Main Material	Reqd.
01	Anchor Shackle	Forged steel	02
02	Horn Holder Ball eye	Forged steel	01
03	Disc insulator	Porcelain	04
04	Horn Holder Socket eye	Forged steel	01
05	Cotter pin	Steel	02
06	Split pin	Stainless steel	02
07	Compression clamp	Aluminum / Steel	01
08	Arcing horn-Adjustable	steel	01
09	Arcing horn - Fixed	Steel	01

CEYLON ELECTRICITY BOARD

DIST. PLANNING BRANCH

DISTRIBUTION STANDARDS & SPECIFICATION

DAD - END (TENSION) CLAMP ASSEMBLY FOR LINE CONDUCTORS (ACSR / AAAC / AAC)

DESIGNED BY — EE (DS & S)

APPROVED BY — CHAIRMAN, SPECIFICATION COMMITTEE

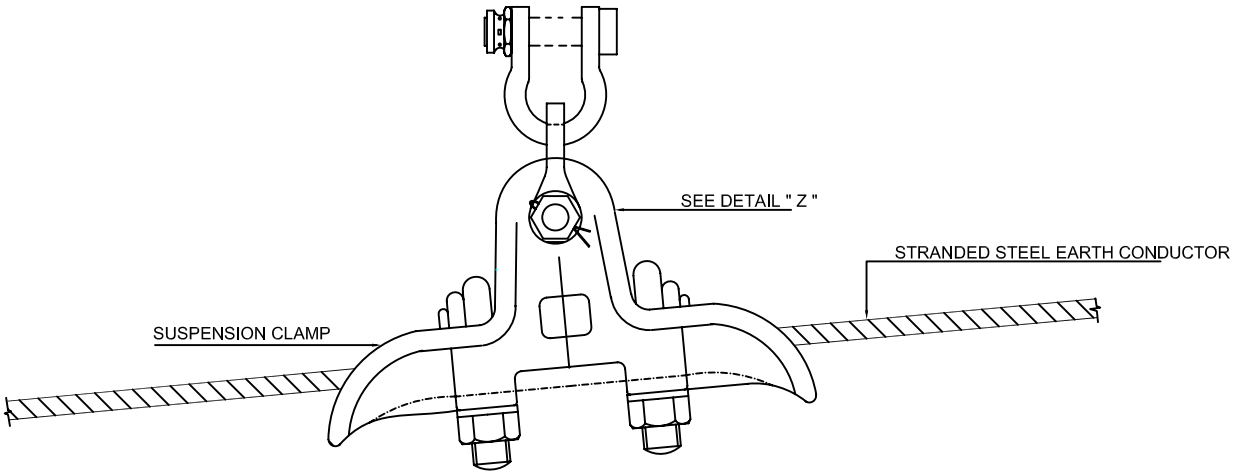
SCALE : NOT TO SCALE

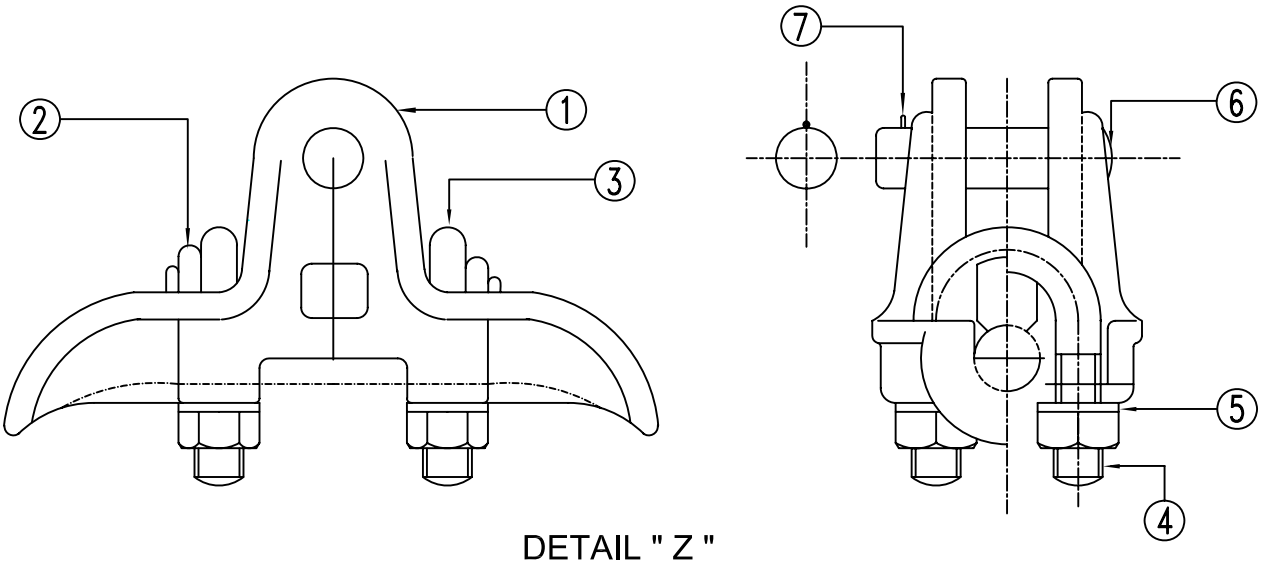
DRAWN : LALANI

DATE : Aug. 2000

DRG. NO : DS&S/056/2/2000

CAD NO :



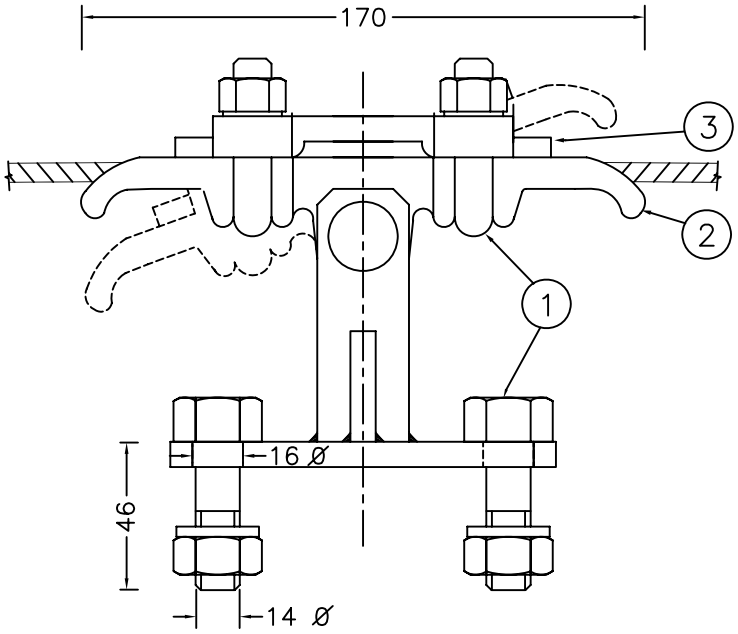


DETAIL " Z "

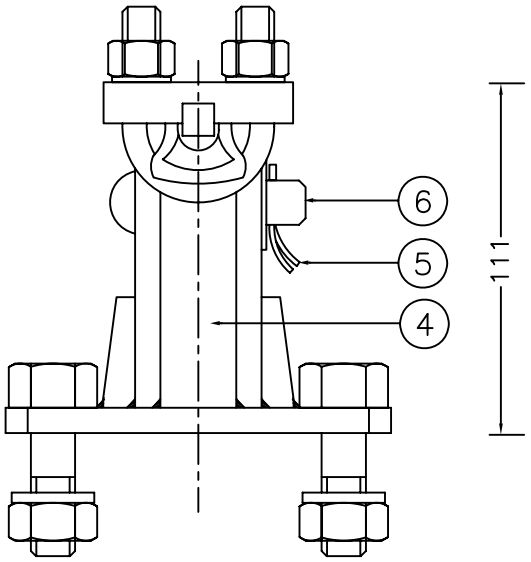
1. Mild Steel (Galv.)
2. Mild Steel (Galv.)
3. Mild Steel (Galv.)
4. Mild Steel (Galv.)
5. Carbon Steel (Galv.)
6. Carbon Steel (Galv.)
7. Stalnless Steel

All Diemensions are in mm.

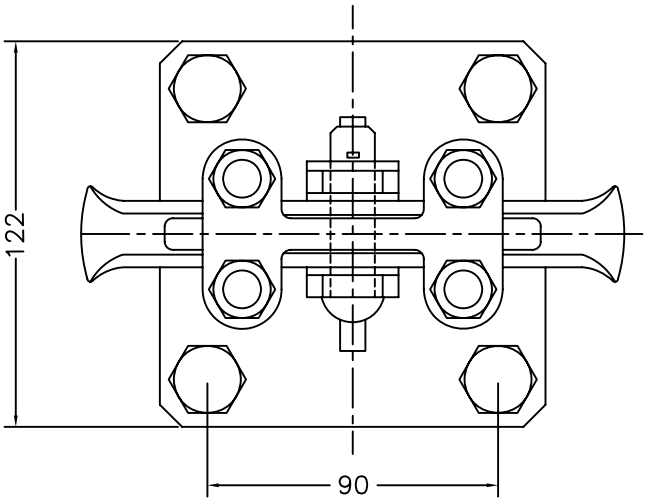
CEYLON ELECTRICITY BOARD	DISTRIBUTION STANDARDS & SPECIFICATION	SCALE : NOT TO SCALE
	SUSPENSION CLAMP ASSEMBLY FOR EARTH CONDUCTOR TYPE A	DRAWN : LALANI
	DESIGNED BY / APPROVED BY	DATE : March, 1997
		DRG. NO : DS&S/056/3/1997
DIST. PLANNING BRANCH	Chief Engineer (DS & S) / CHAIRMAN, SPECIFICATION COMMITTEE	CAD NO :



FRONT ELEVATION



SIDE ELEVATION

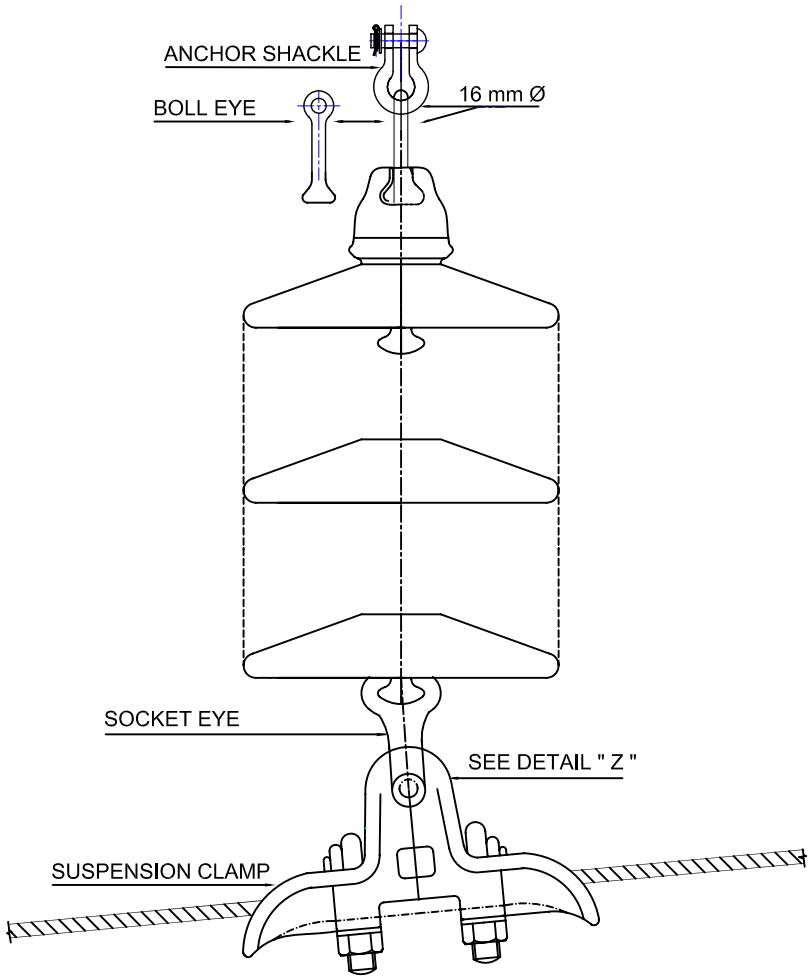


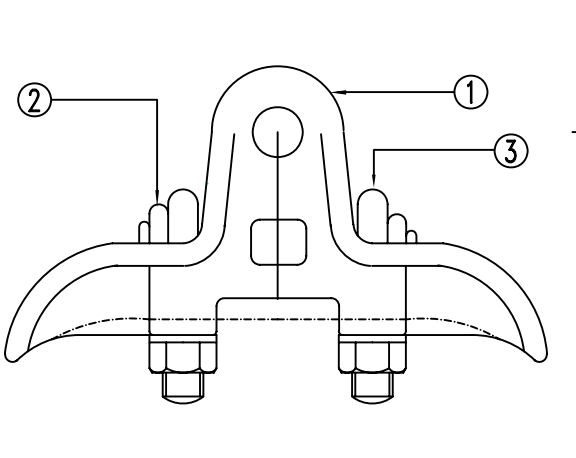
PLAN

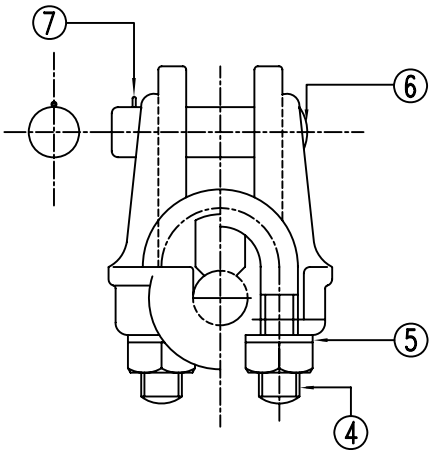
1. Mild Steel (Galv.)
2. Mild Steel (Galv.)
3. Mild Steel (Galv.)
4. Mild Steel (Galv.)
5. Stainless Steel
6. Carbon Steel (Galv.)

All Diemensions are in mm.

CEYLON ELECTRICITY BOARD	DISTRIBUTION STANDARDS & SPECIFICATION	SCALE : NOT TO SCALE
	SUSPENSION CLAMP ASSEMBLY FOR EARTH CONDUCTOR TYPE B	DRAWN : LALANI
	DESIGNED BY / APPROVED BY	DATE : Mar., 1997
		DRG. NO : DS&S/056/4/1997
DIST. PLANNING BRANCH	Chief Engineer (DS & S) / CHAIRMAN, SPECIFICATION COMMITTEE	CAD NO :





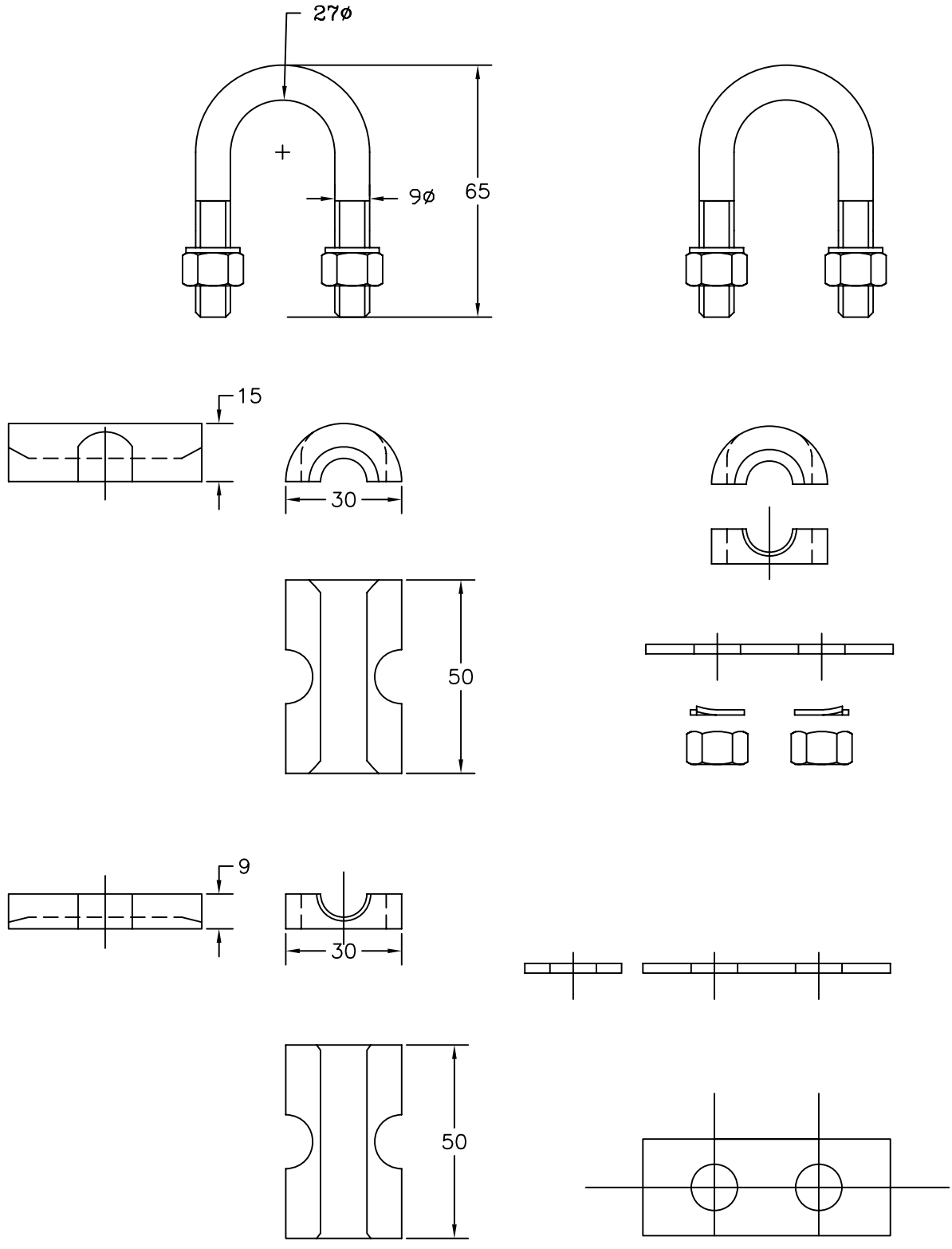


1. Aluminium Alloy
2. Aluminium Alloy
3. Mild Steel (Galv.)
4. Mild Steel (Galv.)
5. Carbon Steel (Galv.)
6. Carbon Steel (Galv.)
7. Stalnless Steel

DETAIL " Z "

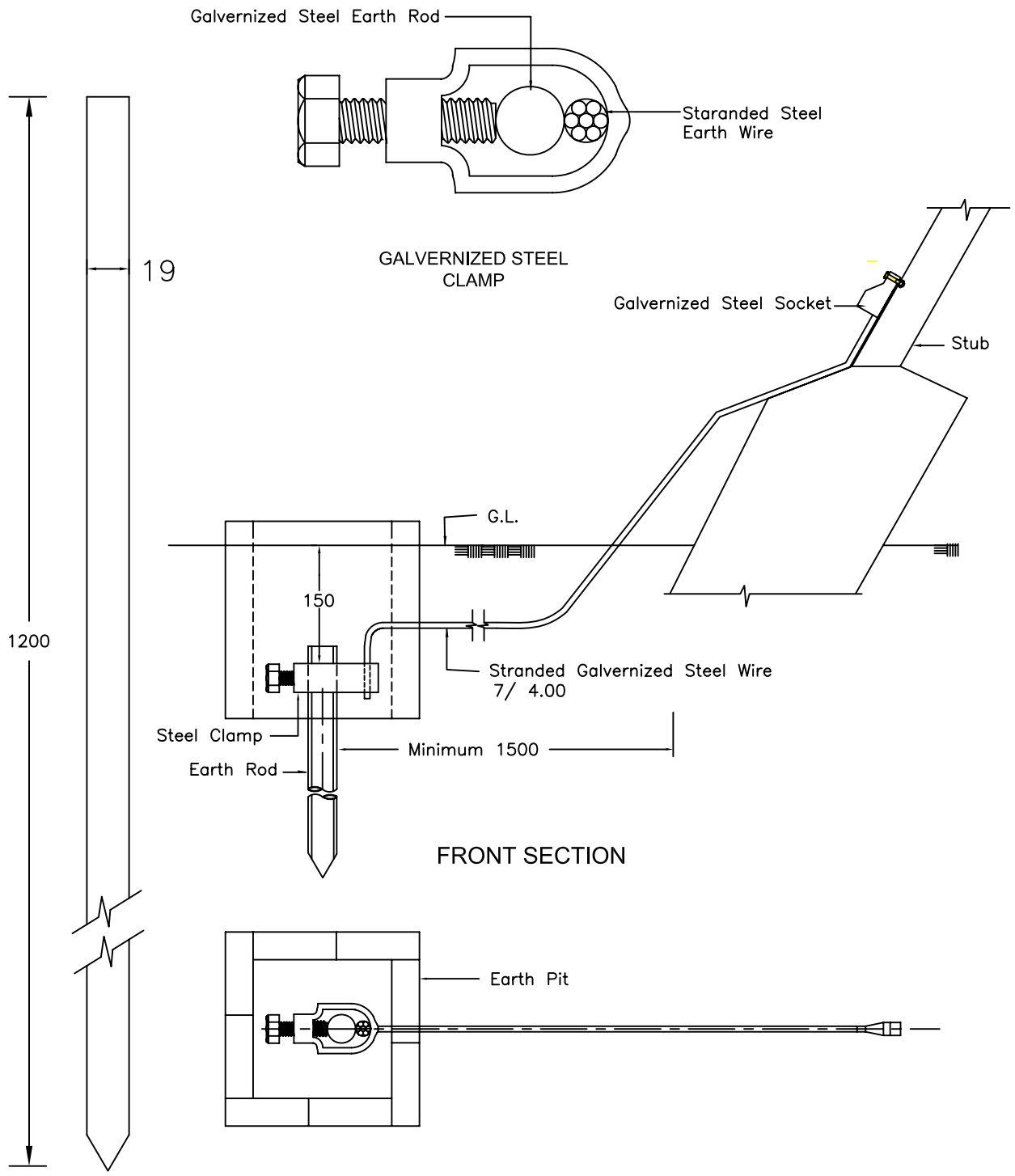
All Diemensions are in mm.

CEYLON ELECTRICITY BOARD	DISTRIBUTION STANDARDS & SPECIFICATION	SCALE : NOT TO SCALE
	SUSPENSION CLAMP ASSEMBLY FOR LINE CONDUCTORS (ACSR / AAAC / AAC)	DRAWN : LALANI
	DESIGNED BY / APPROVED BY	DATE : March, 1997
		DRG. NO : DS&S/056/5/1997
DIST. PLANNING BRANCH	Chief Engineer (DS & S) / CHAIRMAN, SPECIFICATION COMMITTEE	CAD NO :



All Diemensions are in mm.

CEYLON ELECTRICITY BOARD	DISTRIBUTION STANDARDS & SPECIFICATION	SCALE : NOT TO SCALE
	BULLDOG CLAMP	DRAWN : LALANI
	DESIGNED BY / APPROVED BY	DATE : March, 1997
		DRG. NO : DS&S/056/6/1997
DIST. PLANNING BRANCH	Chief Engineer (DS & S) / CHAIRMAN, SPECIFICATION COMMITTEE	CAD NO :



GALVERNIZED STEEL EARTH ROD

TYPICAL EARTHING ARRANGEMENT

ALL DIEMENSIONS ARE IN mm.

CEYLON ELECTRICITY BOARD	DISTRIBUTION STANDARDS & SPECIFICATION	SCALE : NOT TO SCALE
	GALVERNIZED STEEL EARTH ROD ASSEMBLY	DRAWN : LALANI
	DESIGNED BY / APPROVED BY	DATE : Mar. '97
		DRG. NO : DS&S/056/7/97
DIST. PLANNING BRANCH	C.E. (DS & S) / CHAIRMAN, CONS. SPECIFICATION COMMITTEE	CAD NO :

ANNEXURE B

Table -1

SCHEDULE OF TECHNICAL PARTICULARS

Aluminium Conductors Steel Reinforced (ACSR)
Galvanized Stranded Steel Earth Conductor (GSEC)
All Aluminium Alloy Conductor (AAAC)
All Aluminium Conductor (AAC)

Conductor Type and Code	No. & Diameter of Wires		Overall Diameter of Conductor mm	Breaking Load kN	Type of Tension & Suspension Insulator Hardware	ACROSS FLAT DIMENSION OF THE DIE TO BE USED. (mm)	
	Aluminium/Copper mm	Steel mm				Single part Fittings	Two Part Fittings
ACSR							
Weasel	6/2.59	1/2.59	7.77	1.45		14.0	14.0 (Alu) 7.2 (Steel)
Raccoon	6/4.09	1/4.09	12.27	26.90		21.0	21.0 (Alu) 12.0 (Steel)
Dog	6/4.72	7/1.57	14.15	32.70		--	?
Lynx	30/2.79	7/2.79	19.53	79.80		-	29.0 (Alu) 16.0 (Steel)
---	---	---	---	---	**As per IEC 120 U 70 BL String Insulators with "16 mm A" Ball & Socket Couplings**	---	---
AAAC	-	--	-	62.27		26.0	--
Elm	19/3.76		18.8				
---	---	---	---	---		---	---
AAC	-		-				
Cockroach		----		40.87		?	--
---	---	---	---	---		---	---
GSEC	19/4.22		21.1				
7/3.25	-	7/3.25	-	40.70		?	--
7/4.0		7/4.0		61.60		?	--
19/2.50	--	19/2.5	9.75	65.31		?	--
---	--	---	12.0	---		---	---
Copper	--		12.5				
HD 6mm	---	---	-	--		?	--
HD Stranded 19/1.53	6.0	---	6.0	--		?	--

	19/1.53		7.65				

ANNEXURE C-1

SCHEDULE OF PARTICULARS
DEAD-END (TENSION) CLAMP ASSEMBLY FOR GSEC/ACSR/AAAC/AAC
(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer/ Country of origin		-
ii.	Applicable standard		-
iii.	Applicable conductor type and size GSEC/ACSR/AAAC/AAC		-
iv.	Material of		
	a. dead end clamp		-
	b. U shackle		-
	c. Cotter Pin		-
	d. Split pin		-
v.	Ultimate tensile strength of the Dead-end Clamp Assembly	kN	-
vi.	Conductor slipping load after crimping jointing the conductor	kN	-
vii.	Continuous operating temperature (Max.)	°C	-
viii.	Whether necessary Bolts, Nuts, Round Washers & Spring Washers provided	Yes/No.	-
ix.	Whether the steel components hot dipped galvanised conforming to BS 729 and clause 4.12	Yes/No.	-
x.	Thickness of Galvanized coating	mm	-
xi.	Weight of galvanized coating per square meter	mg	-
xii.	Net weight of the dead end assembly	kg	-
xiii.	Across Flat Dimension of the Die to be used for crimp jointing	mm	-
ivx.	Whether the Compression dies to be used are Burndy compatible	Yes/No.	-
vx.	Whether the dead end clamp for ACSR pre-filled with Oxide Inhibiting Grease	Yes/No.	-

---

SEAL AND SIGNATURE OF THE BIDDER **Date----------**

ANNEXURE C-2

SCHEDULE OF PARTICULARS
SUSPENSION (NON-TENSION) CLAMP ASSEMBLY FOR GSEC/ACSR/AAAC/AAC
(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer/Country of Origin			-
ii.	Applicable standard		-	
iii.	Applicable conductor type & Size GSEC/ACSR/AAAC/AAC		-	
iv.	Type of Suspension Clamp Assem. for GSEC	Type A/Type B	-	
v.	Material of			
	a. Conductor clamp and the keeper			-
	b. U shackle and U bolt		-	
	c. Cotter Pin		-	
	d. Split pin			-
vi.	Ultimate tensile strength of the suspension Clamp Assembly	kN	-	
vii.	Continuous operating temperature (Max.)		°C	-
viii.	Whether necessary Bolts, Nut, Round Washer & Spring Washers provided	Yes/No	-	
ix.	Whether the Galvanising of Steel components fully conform to BS 729 and Clause 4.12		Yes/No.	-
x.	Thickness of Galvanized coating		mm	-
xi.	Weight of galvanized coating per square meter	mg	-	
xii	Net weight	kg	-	

SEAL AND SIGNATURE OF THE BIDDER **Date----------**

ANNEXURE C-3

SCHEDULE OF PARTICULARS
MID SPAN (Tension) JOINTING SLEEVES FOR GSEC/ACSR/AAAC/AAC
(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer/Country Of Origin		-
ii.	Applicable standard		-
iii.	Applicable conductor type & Size		-
iv.	Type of Material		-
v.	Ultimate tensile strength	kN	-
vi.	Conductor slipping load after crimp jointing the conductors	kN	-
vii.	Continuous operating temperature (Max.)	°C	-
viii.	Across Flat Dimension of the Die to be used for crimp jointing	mm	-
ix.	Recommended number of crimps		-
x.	Current carrying capacity	A	-
xi.	Net weight of the jointing ferrules	kg	-
xii.	Length of the jointing ferrules	mm	-
xiii.	Whether the jointing ferrules is single piece type or two piece type	Yes/No.	-
xiv	Inner diameter of the jointing ferrules	mm	-
xv.	Outer diameter of the jointing ferrules	mm	-
xvi.	Whether the Centre stop provided	Yes/No.	-
xvii.	Whether the Compression dies to be used are Burndy compatible	Yes/No.	-
xviii.	Whether the mid span joints for ACSR/AAAC pre-filled with Oxide Inhibiting Grease	Yes/No.	-

---

SEAL AND SIGNATURE OF THE BIDDER **Date----------**

ANNEXURE C-4

SCHEDULE OF PARTICULARS
SOCKETS (Lugs) FOR GSEC/ACSR/AAAC

(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer		-
ii.	Country of manufacture		-
iii.	Type of Material		-
iv.	Standard applicable		-
v.	Applicable conductor type and size		- -
vi.	Current Carrying Capacity	Amp	-
vii.	Continuous operating temperature (Max.)	°C	-
viii.	Recommended number of crimps	Nos	-
ix.	Across Flat Dimension of the Die to be used for crimp jointing	mm	-
x.	Whether the Compression dies to be used are Burndy compatible	Yes/No.	-
xi.	Whether the aluminium sockets for ACSR pre-filled with Oxide Inhibiting Grease	Yes/No.	-
xii.	Net weight of the dead end assembly	kg	-
xiii.	Whether the Galvanising of Steel Socket fully conform to BS 729 and Clause 4.12	Yes/No.	-
xiv.	Thickness of Galvanized coating	mm	-
xiiv.	Weight of galvanized coating per square meter	mg	-
xiiiv.	Net weight	kg	-

SEAL AND SIGNATURE OF THE BIDDER **Date----------**

ANNEXURE C-5

SCHEDULE OF PARTICULARS
CONDUCTOR REPAIR SLEEVE (ACSR/AAAC)
(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer			-	
ii.	Country of manufacture			-	
iii.	Type of conductor repair sleeve	Two part/Single part		-	
iv.	Type of Material			-	
v.	Number of Strands			-	
vi.	Length		mm	-	
vii.	Overall diameter			mm	-
viii.	Standard applicable			-	
ix.	Applicable Conductor				
	a) Type	ACSR/AAAC		-	
	b) Size (as per schedule of prices)			-	
x.	Number of Crimps			-	
xi.	Net Weight		kg.	-	
xii.	Marking Details			-	

SEAL AND SIGNATURE OF THE BIDDER **Date----------**

ANNEXURE C-6

SCHEDULE OF PARTICULARS
VIBRATION DAMPERS
(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer		-
ii.	Country of manufacture		-
iii.	Type of Material		-
iv.	Standard applicable		-
v.	Applicable Conductor type and Size	Yes/No.	-
vi.	Whether it is of stock bridge pattern	Yes/No.	-
vii.	Whether it is provided with domed self locking nuts to prevent corrosion of the threads	Yes/No.	-
viii.	Whether it is suitable for maintenance under hot line working conditions	Yes/No.	-
ix.	Whether necessary lock nuts, spring washers and Round washers provided	Yes/No.	-
ix.	Whether the Galvanising of Steel components fully conform to BS 729 and Clause 4.12	Yes/No.	-
x.	Thickness of Galvanized coating	mm	-
xi.	Weight of galvanized coating per square meter	mg	-
xii	Net weight	kg	-

SEAL AND SIGNATURE OF THE MANUFACTURER **Date----------**

ANNEXURE C-7

SCHEDULE OF PARTICULARS
ARMOUR RODS

(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer			-	
ii.	Country of manufacture			-	
iii.	Type of Material			-	
iv.	Length		mm	-	
v.	Overall diameter			mm	-
vi.	Standard applicable			-	
vii.	Applicable Conductor				
	a) Type		ACSR/AAAC	-	
	b) Size	(as per schedule of prices)		-	
viii.	Net Weight		kg.	-	

SEAL AND SIGNATURE OF THE MANUFACTURER **Date----------**

ANNEXURE C-8

SCHEDULE OF PARTICULARS
FLEXIBLE EARTH CONDUCTOR BONDING WIRE

(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer		-
ii.	Country of manufacture		-
iii.	Type of Material		-
iv.	Length	mm	-
v.	Width	mm	-
vi	Thickness	mm	-
vii.	Whether the flat ends suitable for bolting to the palm of the earth conductor dead end clamp with 16m bolts	Yes/No	-
viii.	The current carrying capacity	Amp	-
ix.	Whether the Galvanising of Steel components fully conform to BS 729 and Clause 4.12	Yes/No	-
x.	Thickness of Galvanized coating	mm	-
xi.	Weight of galvanized coating per square meter	mg	-
xii.	Net weight	kg	-

SEAL AND SIGNATURE OF THE MANUFACTURER **Date----------**

ANNEXURE C-9

SCHEDULE OF PARTICULARS
STRANDED COPPER CONDUCTOR FOR EARTHING

(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer		-
ii.	Country of manufacture		-
iii.	Grade of Copper		-
iv.	Standard applicable		-
v.	Number of Strands		-
vi.	Diameter of Strand	mm	-
vii.	DC Resistance of Copper Conductor at 20°C	Ohm	-
viii.	Length of conductor in a coil	m	-
ix.	Weight of 100m coil	kg	-
x.	No. of wrappings of polytene layers		-

SEAL AND SIGNATURE OF THE MANUFACTURER **Date----------**

ANNEXURE C-10

SCHEDULE OF PARTICULARS
SOLID COPPER CONDUCTOR

(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer		-
ii.	Country of manufacture		-
iii.	Grade of Copper		-
iv.	Standard applicable		-
v.	Diameter of the Conductor	mm	-
vi.	DC Resistance of Copper Conductor Wire at 20°C	Ohm	-
vii	Weight of 100m coil	kg	-
ivi.	No. of wrappings of polythene layers		-

SEAL AND SIGNATURE OF THE MANUFACTURER **Date----------**

ANNEXURE C-11

SCHEDULE OF PARTICULARS
SOCKETS (LUGS) FOR COPPER CONDUCTOR
(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer		-
ii.	Country of manufacture		-
iii.	Type of Material		-
iv.	Standard applicable		-
v.	Applicable Copper Conductor Size		-
vi	Palm hole size		-
vii.	Current Carrying Capacity	Amp	-
viii.	Continuous operating temperature (Max.)	°C	-
ix.	Recommended Number of Crimps	Nos	-
x.	Across Flat Dimension of the Die to be used for crimp jointing	mm	-
xi.	Whether the Compression dies to be used are Burndy compatible	Yes/No.	-
xii.	Net weight	kg	-

SEAL AND SIGNATURE OF THE MANUFACTURER **Date----------**

ANNEXURE C-12

SCHEDULE OF PARTICULARS
BULLDOG CLAMP

(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer		-
ii.	Country of manufacture		-
iii.	Type of Material		-
iv.	Standard applicable		-
v.	Whether suitable for clamping GS wires of combination from 50 mm² to 100 mm²	Yes/No	-
vii.	Whether necessary lock nuts, spring washers and Round washers provided	Yes/No	-
viii.	Whether the Galvanising of Steel components fully conform to BS 729 and Clause 4.12		Yes/No.-
ix.	Thickness of Galvanized coating		mm -
x.	Weight of galvanized coating per square meter	mg	-
xi	Net weight	kg	-

SEAL AND SIGNATURE OF THE BIDDER **Date----------**

ANNEXURE C-13

SCHEDULE OF PARTICULARS
GALVANIZED STEEL EARTH RODS
(To be filled by the Bidder)
(Separate sheets shall be provided for each type and size)

i.	Name of manufacturer		-
ii.	Country of manufacture		-
iii.	Material of earth rod		-
iv.	Material of Clamp		
v.	Standard applicable		-
vi.	Length of Earth Rod	mm	-
vii.	Diameter of Earth Rod	mm	-
viii.	Length of Clamp		
ix.	Whether suitable for clamping GS wires of diameter from 8mm to 15mm	Yes/No.	-
x.	Whether the Galvanising of Steel components fully conform to BS 729 and Clause 4.12		Yes/No.-
xi.	Thickness of Galvanized coating		mm -
xii.	Weight of galvanized coating per square meter	mg	-
xiii.	Net weight	kg	-

SEAL AND SIGNATURE OF THE MANUFACTURER **Date----------**

APPROVAL OF CEB STANDARDS

CEB Standard No.	:	*CEB Standard 056 : 1997*
Title of the Standard	:	*Specification for Conductor and Insulator Hardware Fittings for Medium Voltage Overhead Power Lines*
Date of Approval	:	*March 1997*

This is to certify that the above Standard has been approved by us.

S.C. Amarasinghe	Chairman	Specification Committee
A.M. Tissera	Member	Specification Committee
Mrs. B. Jayaweera	Member	Specification Committee
R.J. Gunawardena	Member	Specification Committee
G. Gunawardena	Member	Specification Committee
K. Thayaparendran	Convenor	Specification Committee

CEB Standard 056 : 1997 - Specification for Conductor and Insulator Hardware Fittings for Medium Voltage Overhead Power Lines is approved for adoption in the CEB.

General Manager,
Ceylon Electricity Board.

21-04-97
Date :