West Bengal State Electricity Distribution Company Limited.
Office of the Chief Engineer, Procurement & Contracts Department,

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TECHNICAL SPECIFICATION FOR 11KV,200 Amps ROCKING TYPE T. P.G. O. ISOLATORS.

PART -A : Metallic Part

1. SCOPE :

This specification covers design, manufacture, testing and supply of two post Rocking Type Single Air Break 11KV 3-pole 200 Amps, Gang operated off-load isolator suitable for outdoor installation on D.P. or Sub-Station structures with either Horizontal or vertical mounting .

2. STANDARD :

The Isolator shall conform to IS-1818 (1972) & IS- 9921 (part-I, III & IV) [1981- 85] with latest amendment in general and to our specification in particular.

3. CLIMATIC CONDITION :

The atmosphere in the area is land with industrial gases and smoke with dust in suspension during the months March to June & subject to long colder months. The temperature variation between the daily average and maximum is large. Humidity occasionally rises upto 100%. Heavy lightning is usually in this area during the month of May to November. The area is also subjected to heavy monsoon rains, 80% to 90% of the annual precipitation being in the months of June to October .

Details atmospheric condition is stated below.

a)	Max. Tem. of air in sheds	50 deg C
b)	Min. Tem. of air in sheds	4 deg C
c)	Max. Temp. of air in Sun	60 deg C
d)	Max. daily average ambient temp	45 deg C
e)	Max. yearly average ambient temp.	30 deg C
f)	Max. relative humidity	100%
g)	No of thunderstorm days per annum.	100
h)	Average Nos. of dust storm days per annum	5
i)	Average No. of rainy days per annum	80
j)	Average no. of stormy rain fall days per annum(exceeding 4" in 24 hours)	10
k)	Average rainfall per annum	200 Cm
l)	Max. wind pressure	100 Kg /m^2
m)	Average wind pressure	71.3 Kg /m^2

4. GENERAL ARRANGEMENT *&* CONSTRUCTION :-

4.1 The Isolator shall be of outdoor and channel mounted type similar to construction as per our drawing for single break operation with one fixed post and one rocking post.

4.2 The Isolator shall be provided with connectors at both ends.

4.3 Operating Mechanism With Padlocking Arrangement at 'OFF' & 'ON' position.

The Operating mechanism shall be fabricated from M. S. Plate 35 x 8 x 305 mm in size as per drawing enclosed. The hinged socket which will take the **vertical pipe should be made from 25mm x 5mm MS flat** and the hings arrangement should be perfect, so that, the vertical up and down operation takes place securely and without any obstruction. The **Crank lever** to be made from **25 x 25 x 5 mm M. S. Angle duly pressed at one end to be bolted at the vertical pipe end** and the other end to the square shaft by a clamp. The **clamp** of the crank lever (lever angle) should also be made from **25mm. x 5mm. M. S Flat** with sufficient room to take the square shaft. The G. I. bolts should not be more than the 10mm. dia. (3 / 8") for clamping the square bar. Eye type intermediate guide should be of 12mm dia & 305 mm long or as necessary in length with nut, locknut and flat washer of 2nos. to be provided.

i) Single piece 25 mm^2 M. S. galvanised phase coupling shaft shall be of length 2000mm.

ii) Vertical operating G. I. Pipe shall be of 25mm. nominal bore with 12 SWG (2.65mm) thickness, 6.0 mtrs. in length, in single piece/not more than two equal length, with coupler shall be supplied.

iii) An additional bearing for supporting the phase coupling shaft at the operating end should be provided to avoid distortion during operation. All the above . ferrous parts are to be hot-dip galvanized as per IS:2633 / 1972 and latest amendments thereof.

iv) The Isolator should be suitable for operation from any of the extreme ends of the phase coupling shaft by the same operating mechanism.

v) The handle for operating pipe shall be suitable for gripping by two hands of the operator and the same should be covered with corrugated polythenes / rubber sleeves 'ON' and 'OFF' indication shall be indelibly marked on weather proof and corrosion proof plates riveted to the body of the handle.

4.4 **FIXED CONTACT :**

i) The fixed contacts shall be made from **electrolytic copper strip 25 mm. x 3 mm** as per the drawing and to be **electro silver plated with 8 micron thickness**.

ii) The fixed contact guard also be made from M.S.25mm x16SWG strip shaped as per drawing and galvanized.

iii) 2 nos. stainless steel springs made from 16 SWG wire shall be used at both side of the fixed contact through 6mm. Dia, 90mm. long stain less steel stud threaded at both ends and provided with stainless steel nuts, check nuts and flat washers. The contact pressure of not less than 30Kg, has to be achieved. The Spring Mechanism shall have to be provided so as to ensure that the speed of opening of contacts is independent of the speed of manual operation.

4.5 MOVING CONTACT :

The moving contacts shall be made from 16 mm dia hard-drawn electrolytic copper rod and the length of the moving contact is 175 mm. One of the rod shall be 'flattened' by drop forging as per drawing and provided with holes so that, the same is bolted on the moving insulator, other end is to be bent as per drawing for making contact into the contact jaw (forming line contact) **the palmed portion of the copper rod should have minimum 23 mm width and 8.5 mm thickness.** The bolts used for fixing the moving contact and the Insulator top shall be of stainless steel. The round portion of the moving contact shall be silver electroplated with 8 micron deposit.

4.6 TERMINAL ARRANGEMENT :

Terminal plate shall be made from the electrolytic copper flat of 25 mm x 6mm thick & 114 mm in length as per drawing, so that, the arcing horn and the connector may be clamped.

4.7 FLEXIBLE JUMPER :

The flexible breaded tape, woven with line tinned copper wire having minimum size of 25mm (Width) X 3 mm (thickness) and minimum weight of 360 gm. per meter length. The breaded tape will be treated as a part of the Isolator and the temperature-rise should be within the allowable limit as per I.S.S. when full load current is passed through the isolator. **The length of breaded tape will be 1000 mm in each phase**. The both ends of the tape will be suitably terminated by tinned copper sockets. They shall be provided with a Connector at one end to connect it with Aluminum conductors not exceeding 10 mm dia and the other end must be securely fixed at the terminal pad of the Rocking insulator with nut / bolt/ washer etc. The connectors shall be such as to facilitate easy replacement during future maintenance.

4.8 PANTOGRAPH ASSEMBLY :

The **Pantograph** shall be fabricated from **30 x 3 mm M.S. Flat** duly galvanized and fitted with hinge for folding and unfolding the Pantograph during 'Back and Forth' movement of the insulator assembly. It shall have efficient width to accommodate the flexible tape Twisted M.S. Flat 25 x 3 mm pieces shall be used to hinge the Pantograph ends with Rocking & Fixed Insulators.

4.9 FIXED & MOVING ARCING HORN :

Arcing horn are to be made from 6 mm dia Mild steel rod duly galvanized or 8 mm phosphor bronze for smooth and even surface. The two parallel limbs of the fixed arcing horn, shall be spaced strictly as per drawing, so that, the spring action remains permanent. The moving arcing horn will have eye at one end for bolting with the moving contact at its flat space and in addition a clamp made of **non-ferrous strip of 16 mm (width) X 20 SWG (thick) to be provided for tightening the arcing horn** with the moving contact at round portion. **The arcing horn shall make contact 'before' and break 'after' main contacts** so that it can break the magnetizing / charging current to avoid any damage to contacts.

4.10 **CONNECTORS:**

Two numbers twin grooved(one for ACSR Weasel and other for ACSR Rabbit conductor) bolted type connector as per drawing shall take with copper aluminum bi-metal in lay of size 25x25 x 1 mm at the incoming side (fixed

contact) and the other connector shall be fitted at the free end of the flexible jumper. **The palm of the connector should be of size of 25 mm (width) x 10 mm (thickness) x30 mm(length):**

i) 0.03 sq. mm. copper equivalent ACSR(Weasel) of 7.8 mm. dia.

ii) 0.05 sq. mm. copper equivalent ACSR (Rabbit) of 10mm. dia

iii) percentage of alloy of the Aluminium connector to remain as follow:

a)	Aluminium	80% minimum
b)	Iron	Less than 1%
c)	Silicon	Less than 15%
d)	Cu-Mg. Zn Pb	Less than 0.25.%
e)	Manganese	Less than l.0%

a) **ROCKING BASE :**

M . S . Galvanised box type rocker shall be made from 3mm thick MS sheet x 80 mm width. Rocker shall be fitted on the base channel through M S Galvanized studs 12 mm dia which should be passing through glass nylon / brass bush to be fixed at the side walls of the channel moving post insulator to be fitted on the rocker for back and front movement.

b) **BASE CHANNEL:**

The base channel shall be of size 75 x 40 x 5 mm and hot dip galvanized. The ends of the channel shall be free from sharp corners.

4.11 **EARTHING:**

(i) The 11 KV system is effectively earthed. The Isolator shall be provided with earthing terminals, fixed with bolts and nuts, the diameter of the bolts being at least 12 mm in at least one of the three base channels provided in each set of Isolator.

(ii) Each operating handle will be provided with earthing terminal along with bolt and nut of above sizes.

(iii) All the earthing terminals will be marked indelibly with the earthing symbol.

4.12 **PROTECTIVE COATING :**

All the ferrous parts must be hot-dip galvanized as per IS:2633/1972 or latest amendments thereof and will successfully withstand **four successive one minute dip in CuSo4 solution** of Sp. Gr. 1.186 as prescribed in the relevant ISS.

5 **MARKING:**

Name plate shall have to be provided in each channel of isolator with the information as specified in clause No. 10. 1 of IS 1818-1972. The name plate shall be weather proof and corrosion proof. Manufacturer's serial number and customer's order reference shall be indicated in the name plate.

6 **TOLERANCE :** ± 5% tolerance shall be allowed in dimension.

7 **PACKING :**

Materials shall he packed by wooden crates of suitable thickness to protect against damage in transit and in way that individual units can be despatched at a time complete in all respects so that erection is not hold up for want of any components.

8 DRAWING :

Tentative drawings for complete isolator set are enclosed as following with the specification.

DRAWING NOS :-

1. WBSEDCL/ 11-ROG/1 2. WBSEDCL / 11-ROG/2 3. WBSEDCL / 11-ROG/3
4. WBSEDCL/11-ROG/4 5. WBSEDCL/ 11-ROG/5 6. WBSEDCL/ 11-ROG/6

However, GA drawings of Isolators including different components shall have to be submitted by the Tenderer with the Bid.

After placement of order, drawings are to be submitted & approved before making offer for inspection & testing.

9. ELECTRICAL AND MECHANICAL CHARACTERISTICS :

01	Nominal system voltage	11 KV RMS
02	Highest system voltage	12 KV RMS
03	System frequency	50 Hz (± 3%)
04	Maximum continuous current rating	200 Amps.
05	**Rated short time current rating for 1 Sec.**	**18.4 KA**
06	No. of poles	3
07	Phase center for Isolators	750 mm
08	Min. clearance between fixed and moving contacts of Isolator in fully open position	310 mm
09	Height of the post Insulators to be used in the Isolator.	254 mm

In 'Closed 'Position, the Isolating switch must withstand the mechanical and thermal effects of Short Circuit Current for 1 Sec.

10. COMPLETENESS OF SUPPLY

Any fittings, Accessories or Apparatus which may have not been mentioned in this specification but which are necessary for Isolators' efficient operation, performance and satisfactory maintenance shall be deemed to be included in the Contract and shall be supplied by the Contractor without any extra charges. All Insulators shall be complete in all respects whether the devils are mentioned in the specification or not. Nuts which may work loose in operation must be provided with spring washers / split pins.

NOTE

The Technical specification contained in this section are for guidance of the Tenderer. Deviation if any, from the Purchaser's specification proposed by the Tenderer may be considered provided those are necessary either to improve the Utility, performance and Efficiency of the Equipment to secure overall economy. GA Drawings of Isolators including different components shall have to be submitted by the Tenderer with the Bid showing details of equipment.

The complete isolator shall be manufactured and Supplied against this specification except that for supporting which are excluded from the scope of this specification.

The supporting structure for the isolators are excluded from the scope of this specification.

Drawings for the details of structure for mounting of the isolators shall be furnished by the Purchaser to facilitate design to mounting arrangement etc., to the concerned controlling officer prior to actual execution.

Pedestal Insulators shall be supplied as per specific requirements laid down in Part-B of this Technical specification.

Test certificates for the offered Isolators including Insulators shall be furnished as per Guide lines laid down in Part-C of this Technical Specification.

G.T.P. and other informations of the offered Isolators shall be furnished as per proforma given in Part-D of this Technical specification.

Technical particulars of offered Insulators shall be furnished as per proforma given in Part-E of this Technical specification.

Tenderer shall furnish document including Test certificates and Performance certificates in support of supply & delivery of similar equipment indicating there on the names of the organization, quantity ordered, quantity supplied along with the tender.

Manuals for installation operation and maintenance procedures shall have to be submitted (in six copies) along with the design drawings.

The price (quoted price) should include the price of equipment including all accessories as per schedule of requirement.

While quoting, the supplier shall furnish the recommended list of spares required for a period of three years of operation, item wise prices for the spares shall be furnished separately.

Bill of materials shall be noted in the G.A. drawing as per following Format .

MARK	DESCRIPTION	QUANTITY	MATERIAL	REF.DRG.NO.

PART-B

(A) SPECIFIC REQUIREMENT OF PEDESTAL INSULATOR (FOR 11 KV, 200A TYPE)

1. Each set of 11KV T. P.G. O. Isolator should be provided with 6 (Six) Nos. of 11KV pedestal insulator duly fitted.

2. The post Insulators shall in general conform to the latest issue of IS-2544/ 1973 with all amendments thereof.

3. The porcelain shall be sound, free from defects, thoroughly verified and smoothly glazed.The post insulator shall be brown in colour as per general practice. The glaze shall cover all the porcelain parts of the insulator except the portion which serve as support during firing or left un glaze, for the purpose of assembly.

4. Cement used in the construction of insulators shall not cause fracture by expansion or loosening by contraction and proper care must be taken in" Curing ". Cement shall not give rise to Chemical reaction with the metal fittings and its thickness shall be as uniform as possible.

5. The design of insulators shall be such that scratch due to expansion or contraction on any part of insulators shall not lead to deterioration .The porcelain shall not engage directly with hard metal.

6. The post insulators should be cemented by manufacturer of insulator. Suitability of cementing shall be ensured by required tests specified in the relevant Indian Standards.

(B) SPECIFIC REQUIREMENT OF POST 1NSULATOR (FOR 11 KV,200A TYPE)

1. The contractor should supply post insulators originally cemented by the manufacturer of the insulators. They will submit The routine test certificate from the Insulator manufacture covering both electrical and mechanical tests as per IS : 2544 / 1975.

2. The Test Certificate of the Insulator manufacturer shall be written as 'for insulator only' and shall contain Invoice/Receipt No. etc. along with P.O.No. & Date of WBSEDCL. The papers are to be submitted along with the works test certificate in each offer. On such Test Certificates the contractor should certify that the insulators mentioned in such test certificates are to be used in 11 KV isolator only against PO No. and date of WBSEDCL. The contractor shall have to make arrangement at their cost for the mechanical tests on such insulators as per IS 2544, 1973 for checking the mechanical properties of Post Insulators during inspection by the purchaser.

SPECIFIC TECHNICAL PARAMETERS OF 11 POST INSULATORS :

Sl. No.	Description		11 KV Post Insulator
1	Nominal system voltage/Working voltage	:	11 KV
2	Highest system voltage	:	12 KV
3	No. of units per Stack	:	1
4	Minimum specific Creepage distance	:	25 mm per KV
5	P.F Visible Discharge Voltage	:	9 KV rms
6	P.F. Withstand Voltage		
	a) Dry	:	60 KV rms
	b) Wet	:	35 KV rms
7	Impulse withstand voltage **1.2/50 micro second wave :**		
	a) Positive	:	75 KVp
	b) Negative	:	80 KVp

Sl. No.	Description		11 KV Post Insulator
8	P.F. Minimum flash over voltage		
	a) Dry	:	70 KV rms
	b) Wet	:	45 KV rms
9	Impulse flashover voltage **1.2/50 micro second wave :**		
	a) Positive	:	95 KVp
	b) Negative	:	120 KVp
10	Power Frequency puncture withstand voltage on single unit	:	105 KV rms
11	Cantilever strength on single unit		
	a) Upright	:	5. KN
	b) Inverted	:	3 KN
12	Tensile Strength	:	15 KN
13	Torsional Strength	:	200 Nm
14	Compression Strength	:	30 KN
15	Height	:	254 mm
16	Insulation Part Diameter	:	152 mm
17	Pitch Circle Diameter		
	a) Top	:	57 mm
	b) Bottom	:	57 mm
18	Conforming standard	:	As per IS

PART C :
TEST CERTIFICATES / INSPECTION AND TESTING

1. I S O L A T O R :

The bidder shall submit following copies of complete type test certificates of similar Isolator of identical rating & design as well as on 11 KV Post insulators already conducted in CPRI/NABL accredited/Govt. approved test house or laboratory containing NABL logo. Type test report shall be carried out within five years from the due date of submission of tender. The bidder shall have to submit the type test report along with the tender, otherwise the offer will be rejected.

Following type test report on Isolator shall have to be submitted:

a) Short Time Withstand & Peak Withstand Current Test.
b) Lightning Impulse Voltage Withstand Test.
c) PF Withstand Voltage Test (Dry & Wet)
d) Mechanical Endurance Test
e) Temperature Rise Test

In addition to that, the bidder have to submit Type Test Report on 11 KV Post Insulator as per relevant IS/IEC and technical specification of the Tender along with the Tender document.

The dimensions of the Fixed & Moving Contacts of the sample Isolators, tested successfully for Type Tests in an approved Laboratory, should at least conform to the dimensions as specified in Part – A of this specification. The type of Fixed Contact should be of Reverse Loop Type.

Following Acceptance Tests shall be carried out at the works of the Manufacturer as per relevant ISS before delivery of each lot in presence of our Engineers. The contractors shall furnish 'Routine Test' reports of each unit comprising 'Millivolt Drop Test , 'Operation Test' and ' One Minute Power Frequency Voltage Withstand Test ' in six copies along with each lot offered :-

a) Temperature Rise Test

b) Millivolt Drop Test

c) One minute power frequency voltage withstand test

d) **Operation Test** : The tenderer shall make arrangement for operation test for the total height of the Isolators on selected samples.

e) Uniformity of silver coating on the copper contacts

f) Dimensional Check-up as per drawing and specification on selected samples.

g) **Mechanical Test for Insulator as per IS-2544**

f) Uniformity of zinc coating on ferrous parts (galvanization test)

This test shall be carried out at the Laboratories undertaking tests for Govt. Deptts. and in such case, reports incorporating Test Results from the respective Laboratories should be submitted in support of the contractor's Test Certificates .

Samples at random will be selected from the lot offered for above testing and if any one of the test piece fails, the lot will be rejected.

Contact pressure, Material Quality, Dimensions of the Isolator Contacts and other components shall also be verified /measured (with the approved Drawing). Quoted price should include charges for above stated Acceptance Tests and Type Tests.

Testing of materials: The purchaser reserves the right to get the metal/raw materials/silver coating/galvanizing of any component, tested at any approved laboratory at the cost of manufacturer, in case of any doubt over their quality of such metal / raw material especially for Copper and Aluminium components.

2 Pedestal Insulators:

1. The Pedestal Insulator, to be fitted and supplied along with the Isolators will be tested both for mechanical and electrical characteristics of the complete isolator as per latest issue of ISS:2544/1973 for values as in routine test on samples collected at random from the lot.
2. One or more Insulator (s) may be dismantled by the Purchaser's Representative, from Isolators offered for inspection and the Contractor shall arrange at his own cost for both Mechanical and Electrical Tests at the insulator manufacturer's Laboratory within reasonable time as per latest ISS.
3. The Test values in respect of ' Impulse Voltage Test ' and ' Power Frequency Voltage Withstand Test' on the complete isolators without grounding connectors, should not be less than those specified in ISS and as detailed below :

System Voltage	Impulse Withstand Voltage Positive & Negative Polarity		One Minute Power Frequency Withstand Voltage (RMS)	
	Across Isolating Distance	To Earth and Between Poles	Across Isolating Distance	To Earth & Between Poles
11 KV	85 KV	75 KV	32 KV	28 KV

Rated short time current rating is 18.4 KA (rms) for 1 Sec.

3. The equipment shall be subjected to routine & acceptance tests in accordance with provisions of relevant standards.

Routine & Acceptance tests shall have to be performed in presence of purchaser without any extra cost. The supplier/ manufacturer shall give at least 15(Fifteen) days" advance notice for conducting such tests.

Purchaser shall have the right to select any number on random sampling basis for testing from the equipment ordered for inspection and in the event of failure in such test, the purchaser shall have the right to reject the whole lot.

Six (6) copies of routine & acceptance reports shall have to be furnished to the purchaser for approval before dispatch of the offered equipment.

4. TYPE TESTS AFTER ISSUANCE OF ORDER:

Besides submission of Type Test Report, carried out within five years as per Tender Specification, Type Test at the discretion of Ordering authority, shall have to be arranged by the successful contractor or WBSEDCL on his own may conduct the same from any lot offered for inspection, sample chosen at random after successful routine test by our Inspection team, as per the relevant ISS from any NABL accredited/Government recognized Test House or Laboratory in presence of WBSEDCL'S representative. In case of failure of the materials after type test, WBSEDCL will have the right to reject the total supplied lot of the said materials and the party have to replace the complete lot of materials at his own cost including transportation of materials at site.
However, the necessary cost of the type test charges will be reimbursed to the party on production of necessary supporting documents.

GUARANTEE:

In the event of any defect in the equipment arising out of faulty design, materials, workmanship within a period of **5 (five) years from the date of last despatch** of any integral part of the equipment/cable, the supplier shall guarantee to replace or repair the same to the satisfaction of the purchaser.

If the supplier fails to do so within one month of receipt of intimation, WBSEDCL reserves the right to effect repair or replacement by any other agency and recover charges for repair or replacement from the supplier.

8. DOCUMENTS TO BE SUBMITTED AT THE TIME OF PHYSICAL DELIVERY TO THE CONSIGNEE STORES

The following documents to be submitted by the Vendors to the Consignee Stores at the time of physical delivery :-

a) Copy of Purchase Order.

b) Copy of Despatch Instruction.

c) Inspection Test Certificate.

d) Guarantee Certificate.

e) Proforma Invoice.

f) Seal list and packing list.

g) Challan in triplicate.

h) Way bill, if applicable.

Enclo: ANNEXURE A & B

ANNEXURE A

SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS FOR 11KV 200 A ROCKING TYPE TRIPLE POLE GANG OPERATED AIR BREAK ISOLATING SWITCHES

(TO BE FILLED BY TENDERERS)

11KV 200 A ROCKING TYPE T.P.G.O. Isolators:

1. Name of manufacturer of Isolating Switches
2. Particulars of Isolating Switches:

a) Number of Poles

b) Voltage rating

c) Current rating in Amps :-

i. Normal(Continuous rating)

ii. Maximum & Short time current rating for 1 Sec.

d) Type, Material and contact pressure (in kg.)

of Cu.contacts and stainless steel spring :-

i. Moving Contact

ii. Fixed Contact

iii. Spring

e) Whether contacts are silver coated or tin plated

(the thickness may be indicated)

f) Temperature rise obtained during type test as per clause No.3.2 of IS:9921(Pt.I to V) of the following at the full rated current in degree centigrade over an ambient temperature of 50 ^{O} C

i. Contacts

ii. Terminals

iii. Stainless Steel Springs

iv. Jumper

g) Measurement of the resistance of the main circuits(in milli volt drop) which was obtained during type test as per Clause No.3.2 of IS:9921(Part I to V) :-

i. Contacts(fixed and Moving)

ii. Terminals

h) Frequency

i) Type and material of the terminal connector provided

j) Diameter, wall thickness and length of G.I.Operating pipe

k) Size and length of base mounting M.S. Galvanized channel provided for the three phase :

l) Minimum clearance between phases in mm. and the centre distance between the Insulators of the adjacent phases in mm. in the assembled position of the switch :

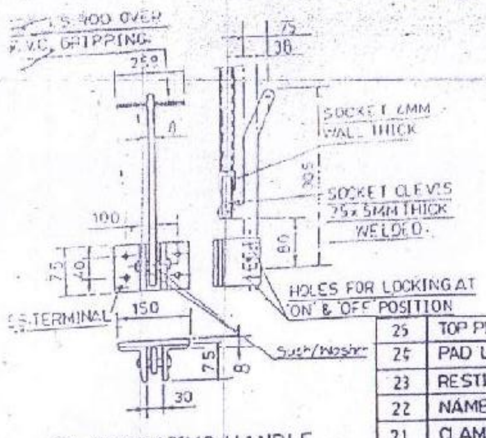
Signature of Bidder

ANNEXURE B

SCHEDULE OF TECHNICAL PARTICULARS FOR 11KV 200 A PEDESTAL TYPE POST INSULATORS (TO BE FILLED BY TENDERERS)

SL.NO.	ITEM
1.	**Particulars of Insulators:**
	a) Type of Insulators
	b) Name of Manufacturer of Insulators.
	c) Height of the Insulators
	d)Diameter of the largest Shed
	e)No of units per stack
2	**ELECTRICAL CHARACTERISTICS (FOR ONE INSULATORS)**
2.1	**FLASH OVER VOLTAGE**
i)	Dry Power frequency
ii)	Wet Power frequency
iii)	Impulse voltage of 1.2/50 micro sec.(+ve)
iv)	Impulse voltage of 1.2/50 micro sec.(-ve) :
2.2	**WITHSTAND VOLTAGE**
i)	Dry voltage
ii)	Wet voltage
iii)	Impulse voltage of 1.2/50 micre sec.(+ve)
iv)	Impulse voltage of 1.2/50 micro sec.(-ve)
2.3	**VISIBLE DISCHARGE VOLTAGE(KVrms)**
2.4	**POWER FREQUENCY PUNCTURE WITH STAND VOLTAGE OF UNIT**
a)	Cantilever strength upright
b)	Cantilever strength under hung (Inverted)
c)	Torsional strength
d)	Tensile strength
e)	Compression strength
2.6	**GENERAL CHARACTERISTICS**
a)	Minimum Creepage distance
b)	Weight of complete unit
c)	Weight of non ferrous Parts(total)
d)	Weight of ferrous Parts(total)
2.7	**STANDARD TO WHICH INSULATOR CONFORMS**

Signature of Bidder



(15) OPERATING HANDLE

Suitable Bush/Washer on both sides of the 8mm. thick handle in between 30mm. gap of the handle base support is to guard against undesirable play are to be provided.

MARK	DESCRIPTION	NO.OFF	SIZE	MATERIAL	REF. DRG. NO.
25	TOP PIPE CLEVIS	1	25x5x150Lg.	M.S.GALVD.	WBSEB/11-ROC/6
24	PAD LOCK	1			" " /12
23	RESTING BOLT	6	10MM.DIA.	M.S.GALVD.	" " /12
22	NAME PLATE (WEATHER PROOF)	3		ALUMINIUM	" " /14
21	CLAMP FOR MOVING ARCING HORN	3	16 MM. 20 S.W.G.	NON-FERROUS	" " /14
20	EARTHING TERMINAL	4	12 DIA. WITH NUT & WASHER	M.S.	" " /12
19	FOURTH BEARING ASSLY WITH M.S. BASE ANGLE	1	60 WIDE x 8 THK.	M.S. GALVD.	" " /5&5
18	BI-METAL INLAY	6	25x25x1 MM	ALU- CU.	" " /12
17	FLEXIBLE JUMPER	3	Flexible Copper Braided Tape: 25x5mm. x [illegible]	Copper (Tinned)	" " /13
16	CONNECTOR	6	25x55LG.x8THK. PAD AFTER GROOVE	ALUMINIUM	" " /13
15	OPERATING HANDLE ASSLY.	1	38x8 WITH 150x8 BASE /SOCKET CLEVIS 25x5FLAT	M.S.	" " [illegible]
14	PHASE COUPLING SHAFT	1	25 SQ. x 2 MTRS. LONG	M.S.	" " [illegible]
13	OPERATING CRANK LEVER	1	25x25x5x240MM LONG ANGLE	M.S.	" " [illegible]
12	OPERATING DOWN PIPE	1	25 NB. x 12 SWG. x 6 MTRS LONG	G.I.	" " [illegible]
11	INTERMIDIATE GUIDE (EYE TYPE)	1	12Ø x 305 LENGTH, EYE HOLE DIA 40 mm.	M.S.	" " [illegible]
10	FIXED CONTACT BASE	3	25x3MM. (45 PROJECTED)	M.S.	" " [illegible]
9	FIXED/MOVING ARCING HORN	3 EACH	5 MMØ	Bright Steel (Galv)	" " [illegible]
8	CONTACT SPRING	6	16 S.W.G.	STAINLESS STEEL	" " [illegible]
7	CONTACT STUD	3	6Ø x 50MM. LONG	— DO —	" " [illegible]
6	MOVING CONTACT BLADE (W.B.S.E.B. TO BE EMBOSSED AT THE OUTER SURFACE)	3	16Ø ONE BENDED & OTHER END FLATTEND UP TO 100MM	HD:EC:COPPER	" " [illegible]
5	FIXED CONTACT ASSLY.	3	25x3MM x 100 HEIGHT x 40 WIDE	HD:EC:COPPER	" " [illegible]
4	TERMINAL PAD	3	25x6MM. x 114 PROJECTED ([illegible])	HD:EC:COPPER	" " [illegible]
3	INSULATOR	6	254 HEIGHT, 57 P.C.D. BROWN GLAZED.	PORCELAIN	" " [illegible]
2	ROCKER BASE ASSLY.	3	80x3 MM	M.S.	" " /15
1	BASE CHANNEL	3	75x40x5MM THK. x 340 MM. LONG	M.S.	" " [illegible]

NOTE—
- ALL DIMENSIONS ARE IN MM.
- ALL FERROUS PARTS SHALL BE HOT DIP GALV.
- WEIGHT OF THE ISOLATOR WITHOUT G.I.PIPE-83KGS.APPX.
- BOLTS & NUTS OF CURRENT CARRYING PARTS SHALL BE OF STAINLESS STEEL.
- TOLERANCE ON DIMENSIONS ±5 %.
- EMBOSSING—W.B.S.E.B. TO BE EMBOSSED AT THE OUTER SURFACE OF ITEM NO 4,5&6

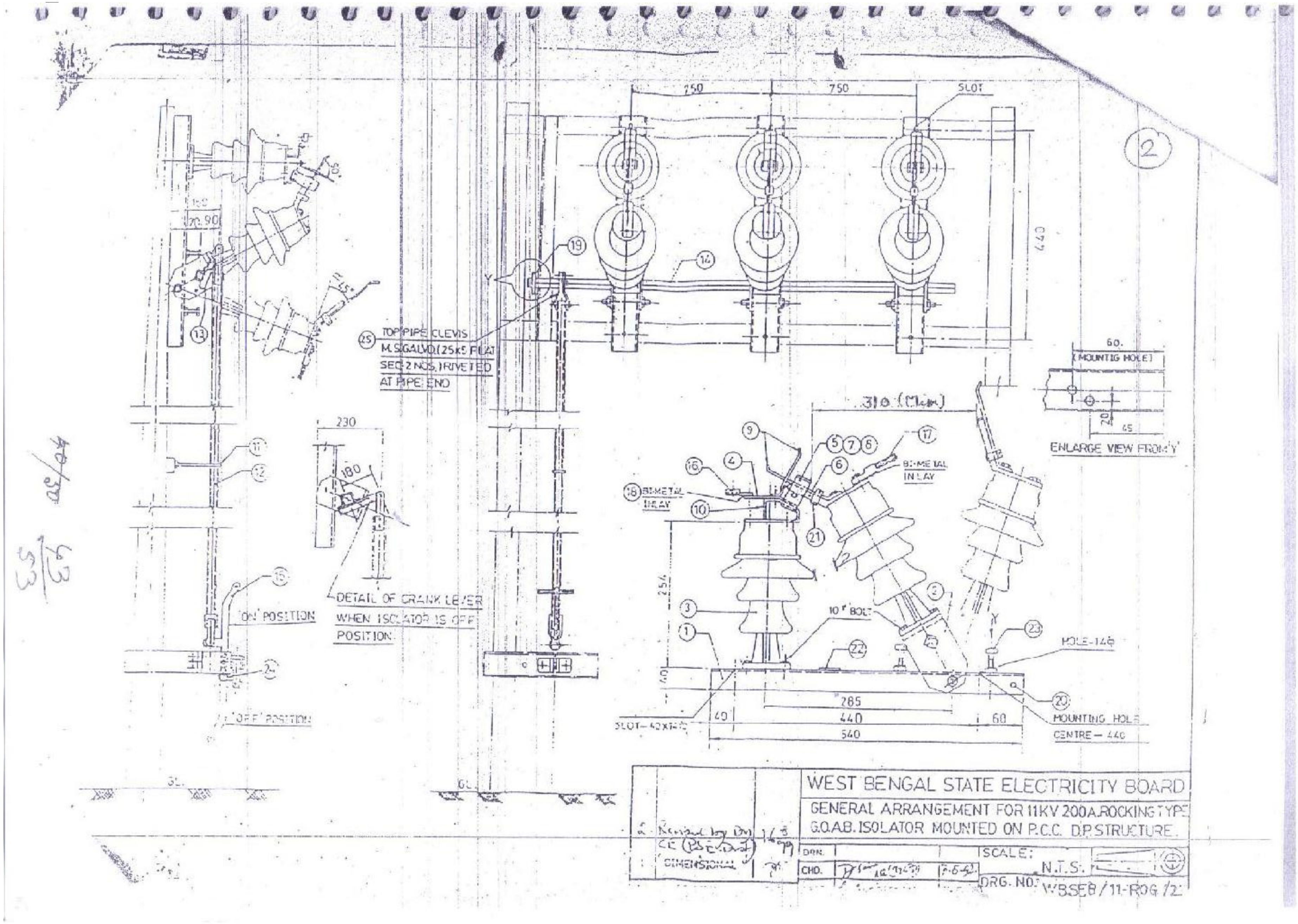
NO.	REVISION	CHD.	APPD.
2.	Revised by [illegible] CE (PSE) [illegible]		
1	DIMENSIONAL	[illegible]	

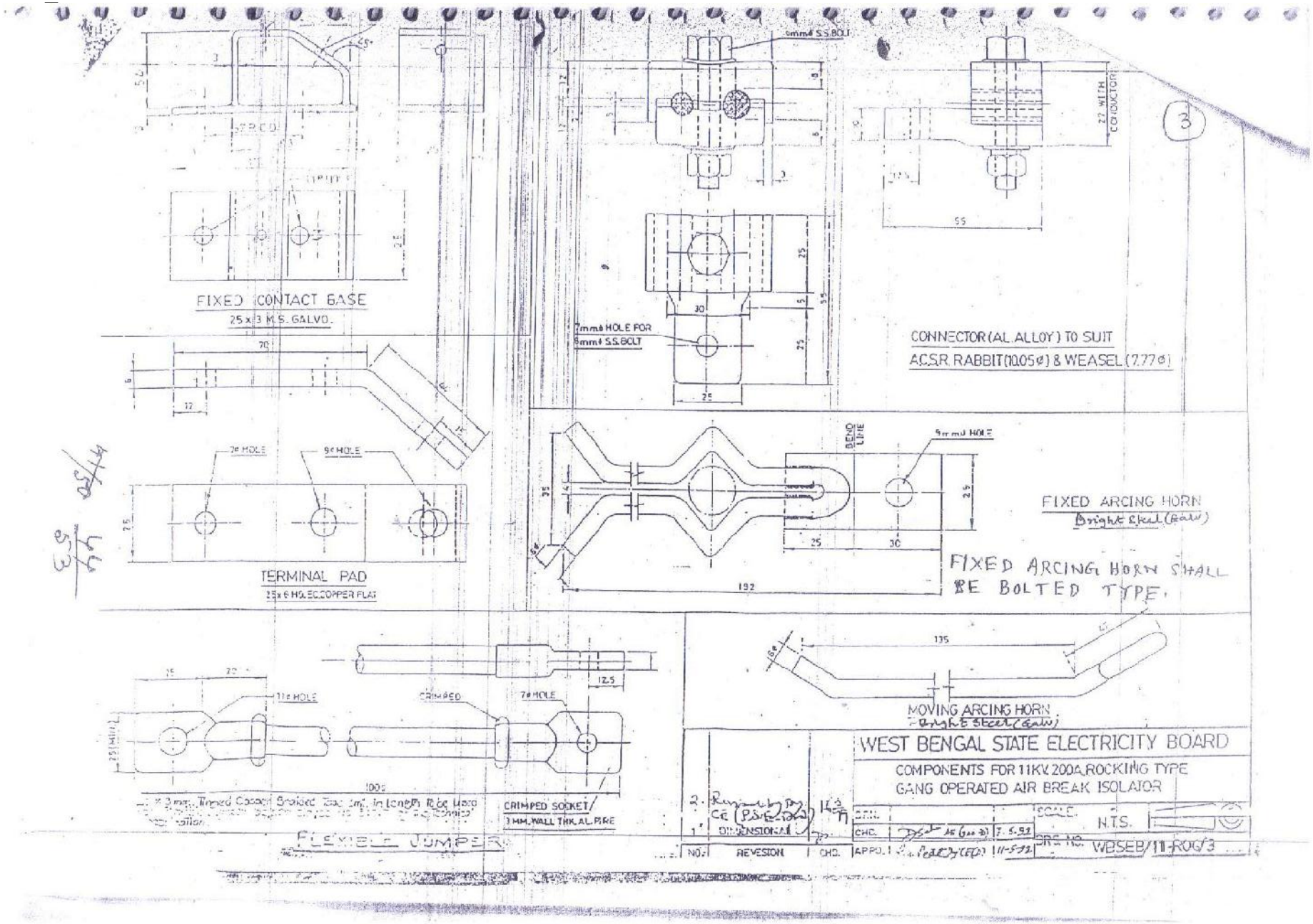
WEST BENGAL STATE ELECTRICITY BOARD

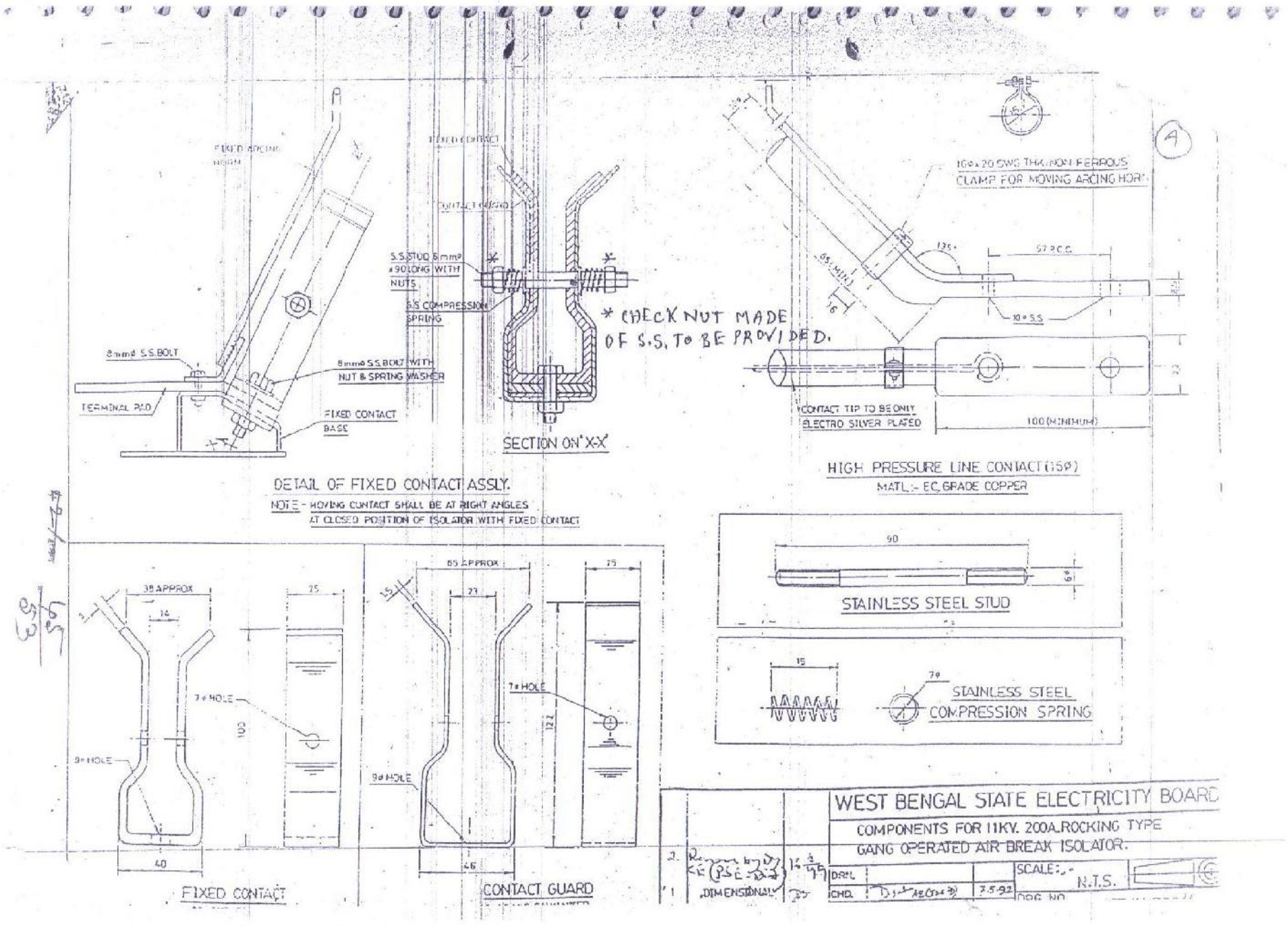
GENERAL ARRANGEMENT FOR 11KV. 200A. ROCKING TYPE G.O.A.B. ISOLATOR MOUNTED ON P.C.C. D.P. STRUCTURE.

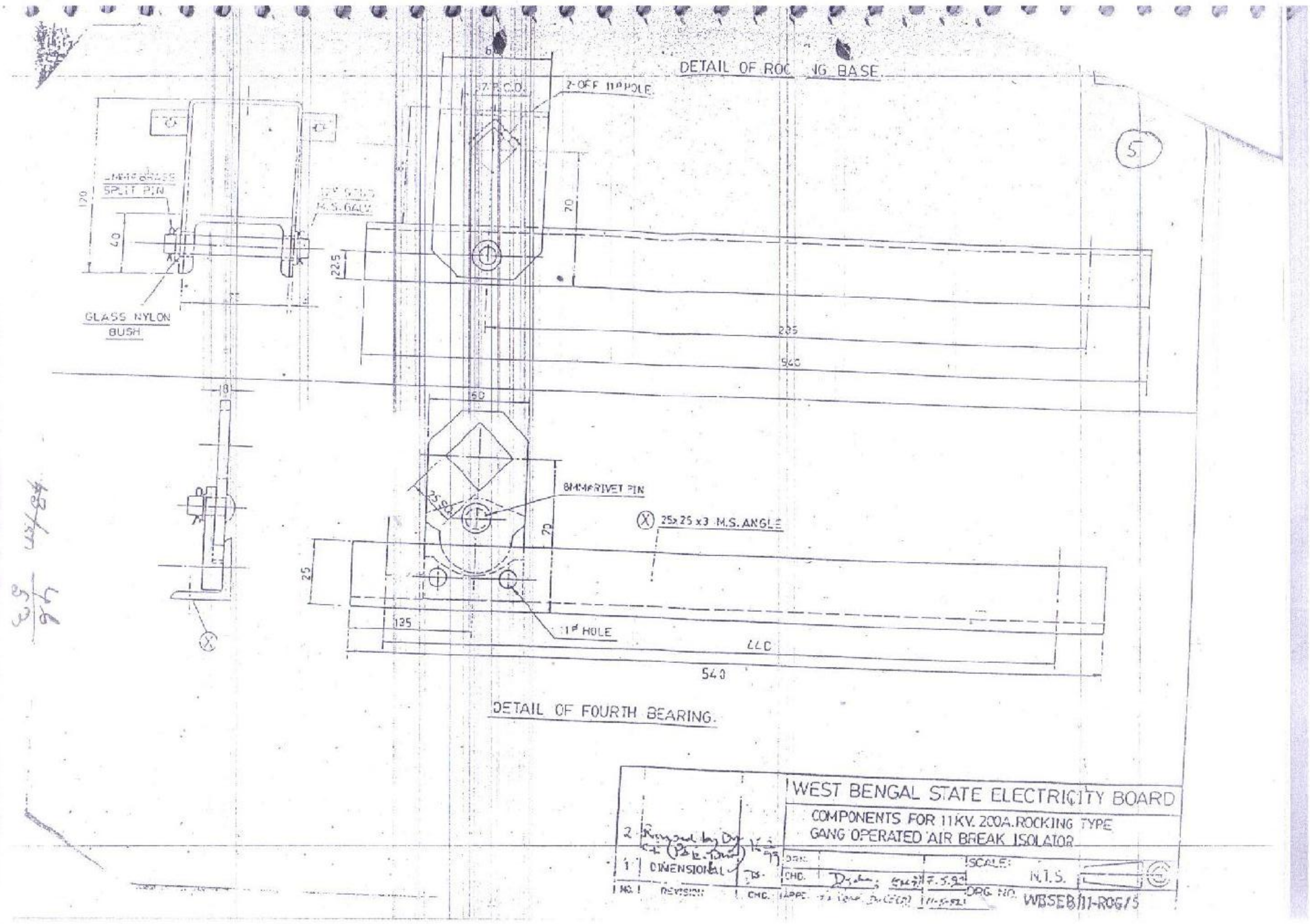
DRN.			SCALE N.T.S.
CHD.	[illegible]	7.5.93	
APPD.	[illegible] Dy. C.E.(D)	11-5-93	DRG. NO. WBSEB/11-ROC/1

42
553

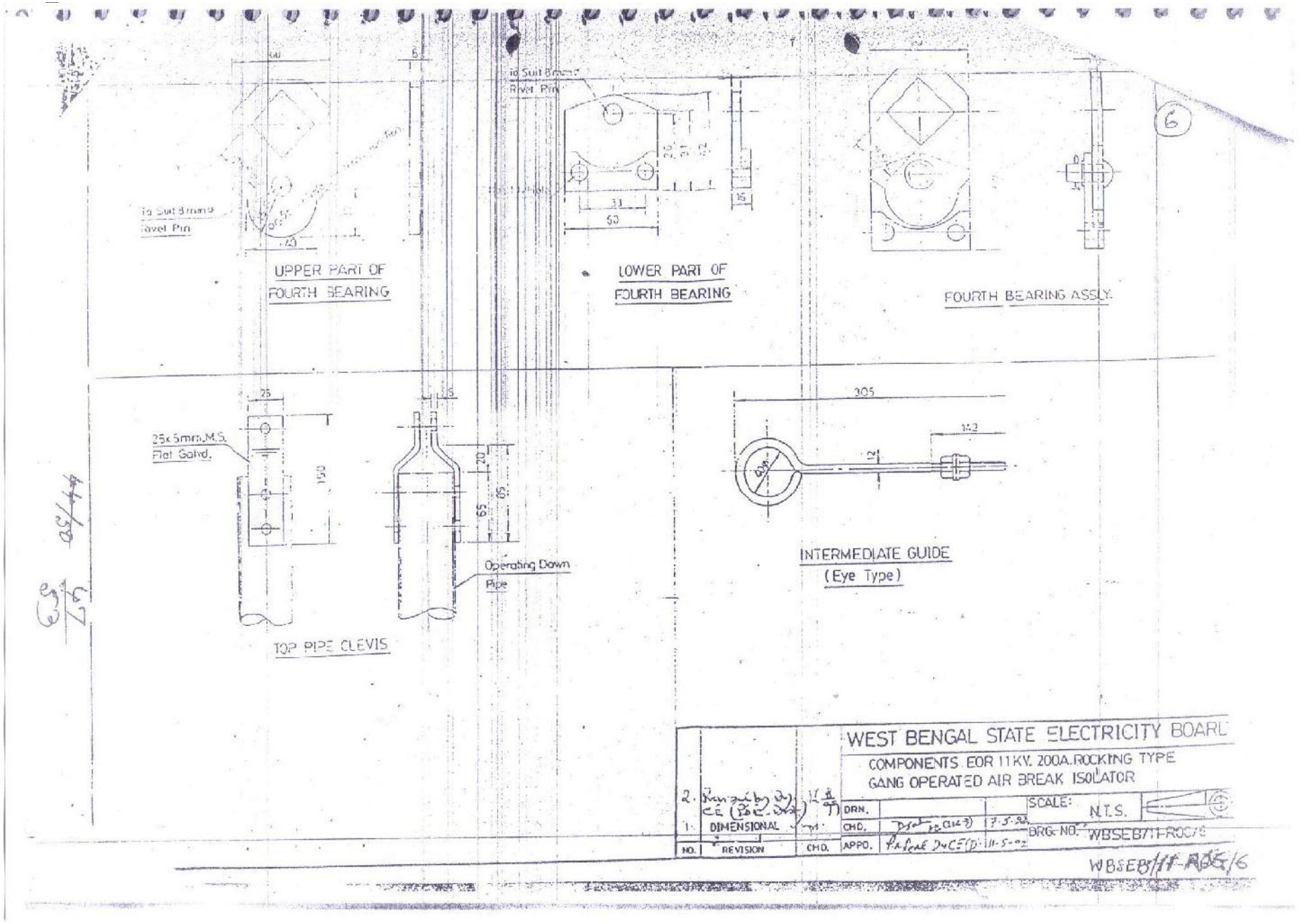

WEST BENGAL STATE ELECTRICITY BOARD
GENERAL ARRANGEMENT FOR 11KV 200A.ROCKING TYPE G.O.A.B. ISOLATOR MOUNTED ON P.C.C. D.P. STRUCTURE.
SCALE: N.T.S.
DRG. NO: WBSEB/11-R0G/2
DRN.
CHD.
DIMENSIONAL
TOP PIPE CLEVIS M.S.GALVD.(25x5 FLAT SEC-2 NOS.) RIVETED AT PIPE END
DETAIL OF CRANK LEVER WHEN ISOLATOR IS OFF POSITION.
'ON' POSITION
'OFF' POSITION
ENLARGE VIEW FROM 'Y'
(MOUNTIG HOLE)
BI-METAL INLAY
10 ф BOLT
HOLE-14ф
MOUNTING HOLE CENTRE - 440
SLOT
SLOT-42X14
310 (Min)
750
750
230
180
254
285
440
540
40
60
45°
50°
40/50
43/53


FIXED CONTACT BASE
25 x 3 M.S. GALVD.
TERMINAL PAD
25 x 6 H.D.EC COPPER FLAT
7mmø HOLE FOR 9mmø S.S.BOLT
9mmø S.S.BOLT
CONNECTOR (AL. ALLOY) TO SUIT
ACSR RABBIT (10.05ø) & WEASEL (7.77ø)
FIXED ARCING HORN
Bright Steel (Galv)
FIXED ARCING HORN SHALL BE BOLTED TYPE.
MOVING ARCING HORN
Bright Steel (Galv)
FLEXIBLE JUMPER
CRIMPED SOCKET/ 3 MM. WALL THK. AL. PIPE
WEST BENGAL STATE ELECTRICITY BOARD
COMPONENTS FOR 11KV, 200A, ROCKING TYPE
GANG OPERATED AIR BREAK ISOLATOR
SCALE: N.T.S.
DRG. NO. WBSEB/11-ROG/3
NO. REVESION CHD. APPD.


FIXED ARCING HORN
FIXED CONTACT
CONTACT FINGER
S.S.STUD 6mmø x 90 LONG WITH NUTS
S.S COMPRESSION SPRING
* CHECK NUT MADE OF S.S, TO BE PROVIDED.
8mmø S.S.BOLT
8mmø S.S.BOLT WITH NUT & SPRING WASHER
TERMINAL PAD
FIXED CONTACT BASE
SECTION ON 'X-X'
DETAIL OF FIXED CONTACT ASSLY.
NOTE - MOVING CONTACT SHALL BE AT RIGHT ANGLES AT CLOSED POSITION OF ISOLATOR WITH FIXED CONTACT
10mm x 20 SWG THK NON FERROUS CLAMP FOR MOVING ARCING HORN
135°
57 P.C.D.
65 (MIN.)
10mmø S.S.
CONTACT TIP TO BE ONLY ELECTRO SILVER PLATED
100 (MINIMUM)
HIGH PRESSURE LINE CONTACT (15Ø)
MATL:- EC GRADE COPPER
90
STAINLESS STEEL STUD
15
7ø
STAINLESS STEEL COMPRESSION SPRING
38 APPROX
25
16
7ø HOLE
9ø HOLE
40
FIXED CONTACT
65 APPROX
25
15
23
7ø HOLE
9ø HOLE
122
46
CONTACT GUARD
DIMENSIONAL
WEST BENGAL STATE ELECTRICITY BOARD
COMPONENTS FOR 11KV. 200A. ROCKING TYPE GANG OPERATED AIR BREAK ISOLATOR.
DRN.
CHD.
7.5.92
SCALE:- N.T.S.
DRG. NO



DETAIL OF ROC IG BASE.
2-OFF 11Φ HOLE.
SPLIT PIN
M.S. GALV.
GLASS NYLON BUSH
120
40
70
22.5
235
940
60
8MMΦ RIVET PIN
25 SQ.
(X) 25x25 x3 M.S. ANGLE
72
25
135
11Φ HOLE
770
540
DETAIL OF FOURTH BEARING.
WEST BENGAL STATE ELECTRICITY BOARD
COMPONENTS FOR 11KV. 200A. ROCKING TYPE GANG OPERATED AIR BREAK ISOLATOR
1 DIMENSIONAL
NO. REVISION
DRN.
CHD.
APPD.
SCALE: N.T.S.
DRG. NO. WBSEB/11-ROG/5
5


to Suit 8mm ø Rivet Pin
UPPER PART OF FOURTH BEARING
to Suit 8mm ø Rivet Pin
LOWER PART OF FOURTH BEARING
FOURTH BEARING ASSLY.
25x5mm.M.S. Flat Galvd.
TOP PIPE CLEVIS
Operating Down Pipe
INTERMEDIATE GUIDE (Eye Type)
WEST BENGAL STATE ELECTRICITY BOARD
COMPONENTS FOR 11 KV. 200A. ROCKING TYPE GANG OPERATED AIR BREAK ISOLATOR
SCALE: N.T.S.
DRN.
CHD.
APPD.
DRG. NO. WBSEB/TT-ROC/6
NO. REVISION
DIMENSIONAL
WBSEB/TT-ROC/6