

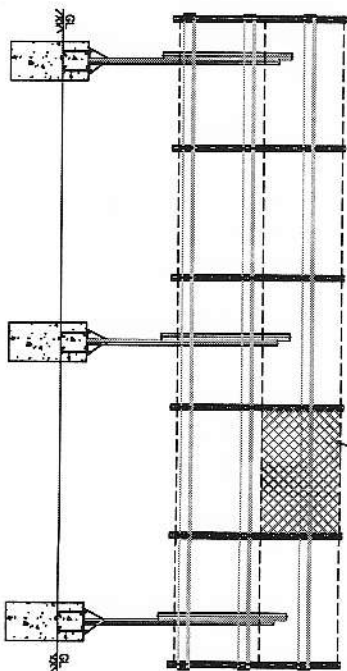
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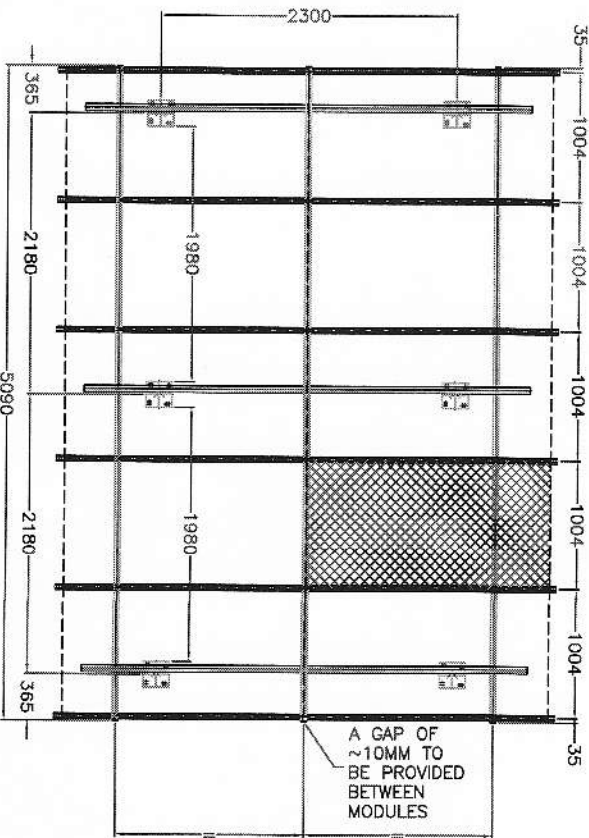
Annexure 2:

Drawing 1: Module mounting structure for PV module

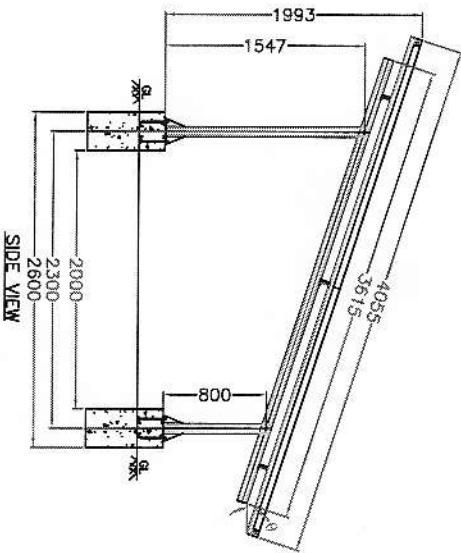
PV MODULE 124270
(1975x995x50MM)



ELEVATION



PLAN



SIDE VIEW

- θ = 18°, FOR BHEL, CORP R&D, HYDERABAD
- 2 ROWS x 5 COLUMNS = 10 PV MODULES PER STRUCTURE

NOTE:

1. ALL JOINTS UNIFORMLY WELDED AND GROUND/EDGES, DRILLED HOLES BURR FREE.
2. DIMENSIONAL TOLERANCES AS PER IS:2102 (MEDIUM) UNLESS OTHERWISE SPECIFIED.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: SPV POWER PLANTS - CORP R & D

BHARAT HEAVY ELECTRICALS LIMITED,
ELECTRONICS DIVISION, BANGALORE

DEPT. SCpV FOR UNSPECIFIED-TOLERANCES REFER ED 0230499
CODE 439

DRN	NAME	SIGN.	DATE	No. OF VAR
OKD	SAN		SEPT '11	
APPD	NAR		SEPT '11	
	SK		SEPT '11	

TITLE: 10x270W PV MODULE MOUNTING STRUCTURE FOR CORP R&D

DRAWING NO. 3 679 05 00487
SHEET NO. 01 NO. OF SHEETS 07

INVENTORY NO.	SIGN & DATE	REF. DRG. NO.
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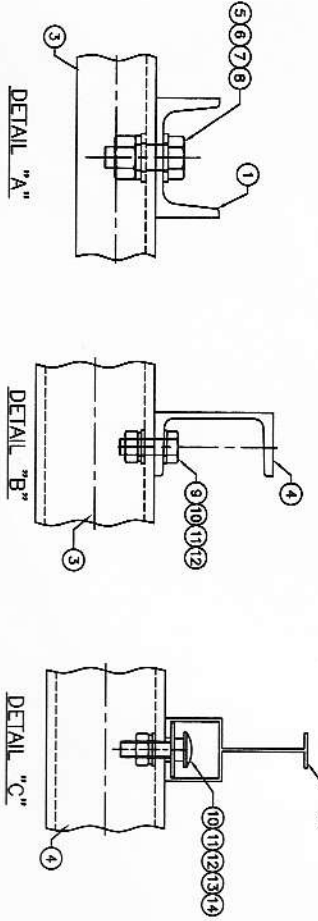
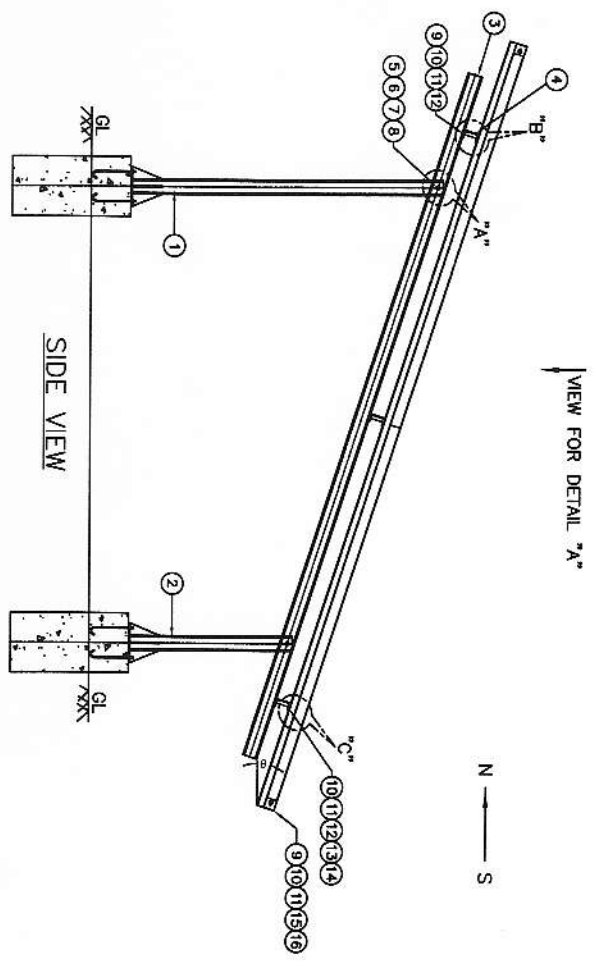
REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	TITLE
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		APPROVED			APPROVED			APPROVED	

1	2	3	4	5	6	7	8
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DRAWING NO. 3 679 5

ANNEXURE 2

Drawing 1 (contd.): Module mounting structure for PV module



BILL OF MATERIALS PER SET OF PV MODULE MOUNTING STRUCTURE

PART NO	UNIT WT. (KG)	QTY PER SET (NOS.)	DESCRIPTION	REF. STD.
20		24	SPRING WASHER #12.2x#21.1x2.5 THK	IS 2063
18		24	FLAT WASHER #14x#24x2.5 THK	IS 2016
16		24	HEX. HEAD NUT M12	IS 1364
17		24	J BOLT AM12x200 (FOUNDATION BOLT)	IS 5624
18	4.95	8	RAFTER - ANODISED 4095 LONG	IS 6340 W/F/HE9
15		20	AL ANGLE BRACKET	IS 6340 W/F/HE9
14		18	COACH SCREW M10	IS 2809
13		18	CLAMPING STRIP SS 304	IS 2063
12		21	SPRING WASHER #11x#18.1x2.2 THK.	IS 2016
11		60	FLAT WASHER - #11x#21x2.0 THK.	IS 1364
10		39	HEX HEAD NUT-M10	IS 1364
9		21	HEX HEAD SCREW-M10x30MM	IS 1364
8		6	SPRING WASHER #16.2x#27.4x3.5 THK.	IS 2063
7		12	FLAT WASHER #18x#30x3.15 THK.	IS 2016
6		6	HEX HEAD NUT-M16	IS 1364
5		6	HEX HEAD SCREW-M16x40MM	IS 1364
4	29	3	RAFTER SUPPORT MEMBER - ISLC 75x5090 LONG	IS 808 & IS 2062
3	20.80	3	PURLIN SUPPORT MEMBER - ISLC 75x3615 LONG	IS 808 & IS 2062
2	9.30	3	PEDESTAL ASSEMBLY - SHORT ISMC 75	IS 808 & IS 2062
1	14.95	3	PEDESTAL ASSEMBLY - LONG ISMC 75	IS 808 & IS 2062

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: SPV POWER PLANT - CORP R&D

BHARAT HEAVY ELECTRICALS LIMITED.
ELECTRONICS DIVISION, BANGALORE

DRN	SAN	DATE	SEPT '11
CHKD	NAR	DATE	SEPT '11
APPD	SK	DATE	SEPT '11

DEPT	SCPV	SCALE	NTS
CODE	439	WEIGHT(KG)	
FOR UNSPECIFIED-TOLERANCES	REFER ED 0230499	REF. TO ASSY. DRG.	

TITLE: 10X270W PV MODULES MOUNTING STRUCTURE FOR CORP R&D

DRAWING NO. 3 679 05 00487

SHEET NO. 02 NO. OF SHEETS 07

REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHECKED			CHECKED			CHECKED
		APPROVED			APPROVED	00		APPROVED
								FIRST ISSUE

INVENTORY NO. SIGN & DATE REF. DRG.NO.

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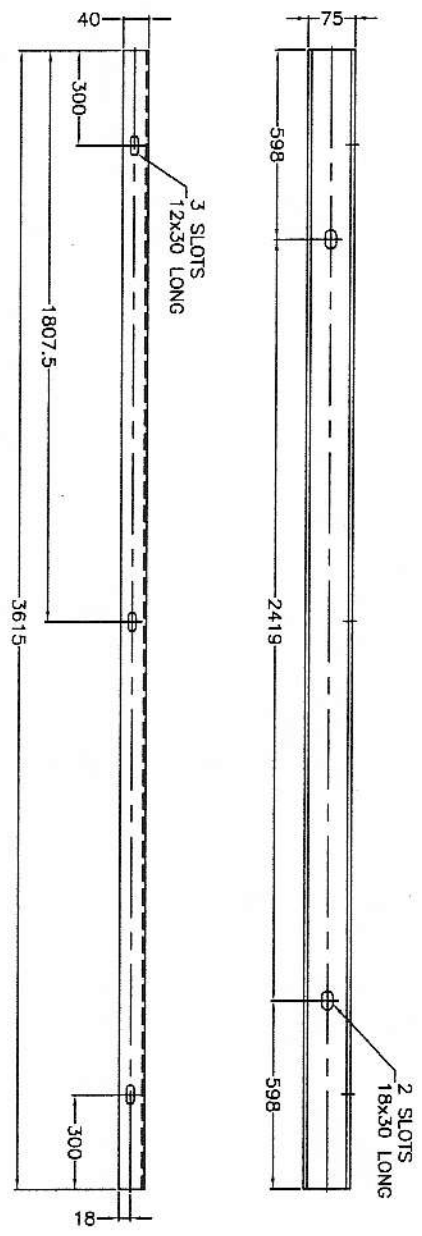
FORM No. A3-02

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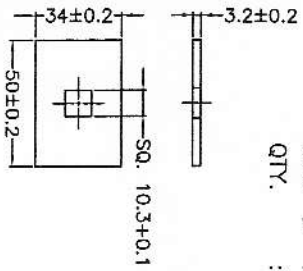
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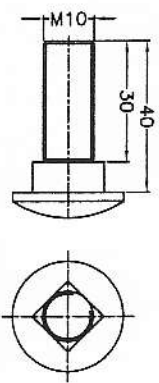
ANNEXURE 2



PART 3 : PURLIN SUPPORT MEMBER - HOT ROLLED STEEL CHANNEL ISLC 75.
QTY. : 3 NOS. PER SET.



CLAMPING STRIP - STEEL SS 304
FINISH : NATURAL
PART (3)



COACH SCREW M10 x 40 AS PER IS:2609
- STEEL SS304
PART (4)

NOTE:
DIMENSIONAL TOLERANCES AS PER IS:2102 (MEDIUM) UNLESS OTHERWISE SPECIFIED.

REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHECKED			CHECKED	00		CHECKED
		APPROVED			APPROVED			APPROVED

FIRST ISSUE

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT : SPV POWER PLANT - CORP R&D

BHARAT HEAVY ELECTRICALS LIMITED.
ELECTRONICS DIVISION, BANGALORE

DEPT. SCpV FOR UNSPECIFIED-TOLERANCES REFER ED 0230499
SCALE NTS
WEIGHT(KG) REF. TO ASSY. DRG.

TITLE

10x270W PV MODULES MOUNTING STRUCTURE FOR CORP R&D

DRN	NAME	SIGN.	DATE	No. OF VMS
OKD	SAN		SEPT '11	
APPD	NAR		SEPT '11	
	SK		SEPT '11	

DRAWING NO.

3 679 05 00487

SHEET NO. 04

NO. OF SHEETS 07

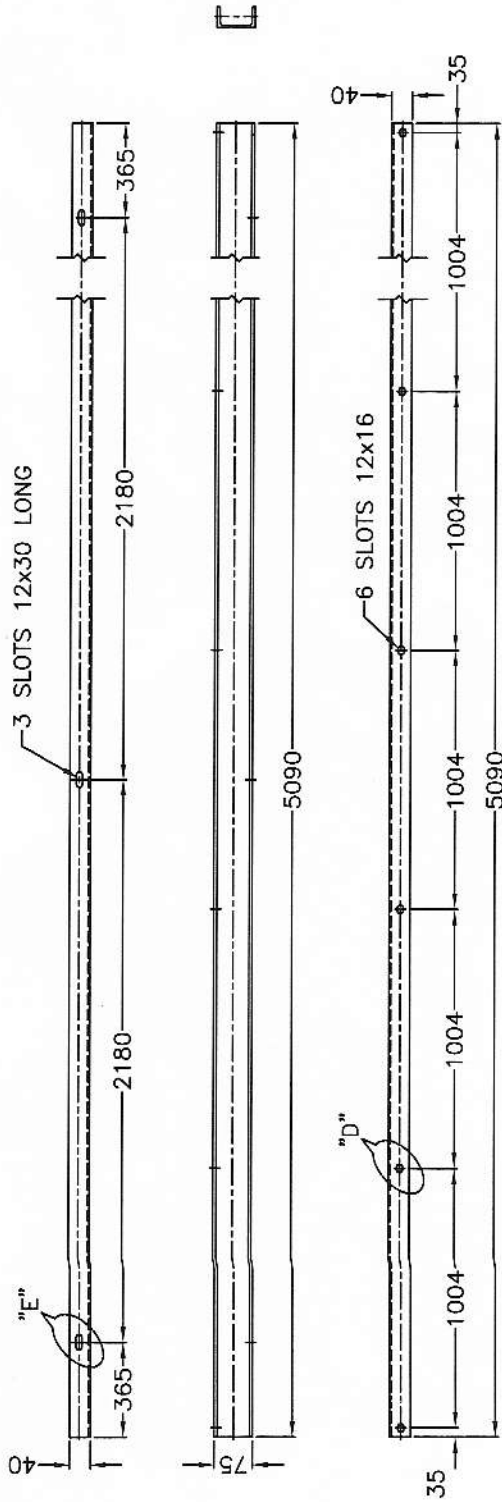
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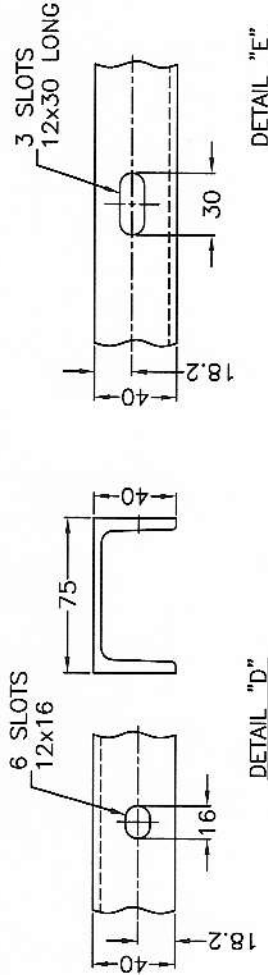
FORM No. A3-02

A3 SIZE

ANNEXURE 2



PART 4 : RAFTER SUPPORT MEMBER - HOT ROLLED STEEL CHANNEL ISLC 75.
QTY. : 3 NOS. PER SET.



DETAIL "D"

DETAIL "E"

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REF. DRG. NO.

SIGN & DATE

INVENTORY NO.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT: SPV POWER PLANT - CORP R&D

BHARAT HEAVY ELECTRICALS LIMITED.
ELECTRONICS DIVISION, BANGALORE

DEPT. SCVP
CODE 439
FOR UNSPECIFIED-TOLERANCES REFER ED 0230499
SCALE NTS

DRN SAN
CKD NAR
APPD SK

SIGN. DATE
No. of VAR
SEPT '11
SEPT '11
SEPT '11

WEIGHT(KG) REF. TO ASSY. DRG.
ITEM NO.
No. OF ITEM

DRAWING NO.
3 679 05 00487
REV. 00

TITLE
10x270W PV MODULES MOUNTING STRUCTURE FOR CORP R&D

REV. DATE ALTERED CHECKED APPROVED
00
FIRST ISSUE

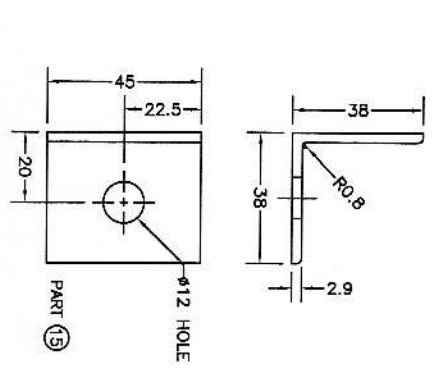
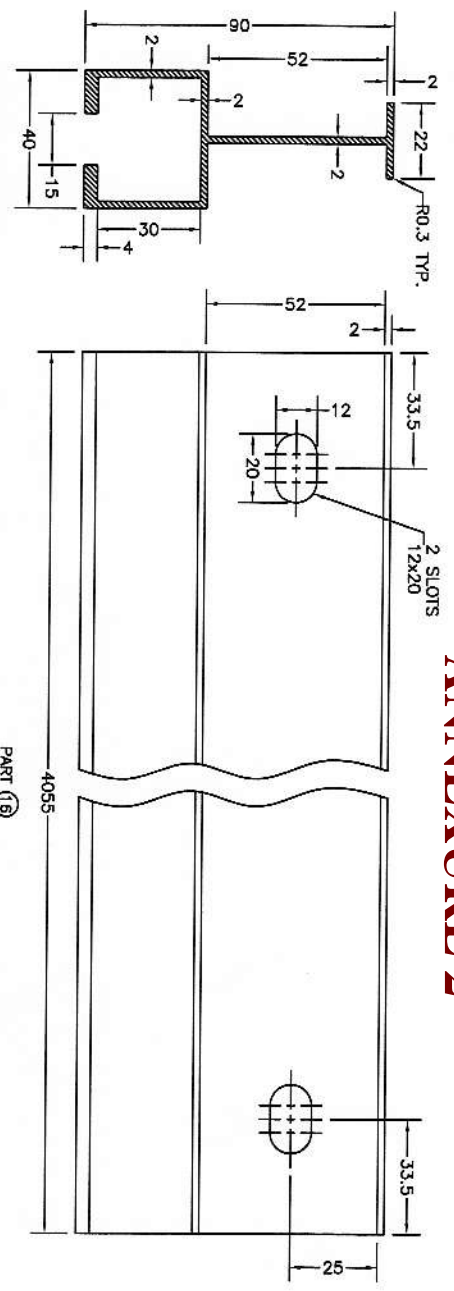
REV. DATE ALTERED CHECKED APPROVED

REV. DATE ALTERED CHECKED APPROVED

REV. DATE ALTERED CHECKED APPROVED

DRAWING NO. 3 679 05 00487

ANNEXURE 2



PART 16 : RAFTER
 QTY. : 6 NOS./SET OF MODULE SUPPORT STRUCTURE

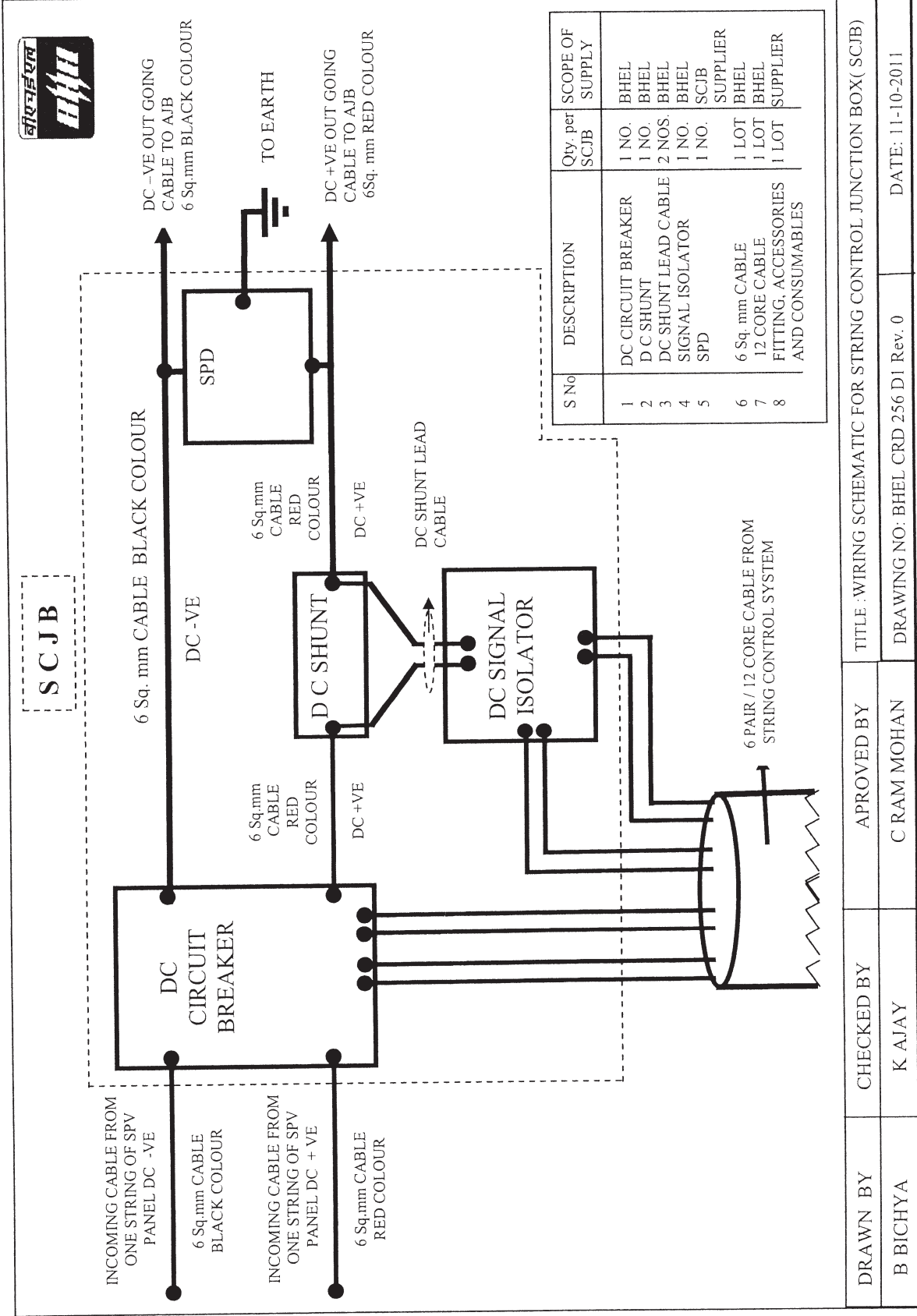
PART 15 : ANGLE 38x38x2.9 THK.
 QTY. : 20 NOS./SET OF MODULE SUPPORT STRUCTURE

- 1) MATERIAL : EXTRUDED ALUMINIUM AS PER IS:6340 WP/H19 (FOR BOTH PARTS 15 & 16)
- 2) NOTE : 1) DIMENSIONAL TOLERANCES FOR EXTRUDED ALUMINIUM AS PER IS:3965.
 2) DIMENSIONAL TOLERANCES FOR FABRICATION AS PER IS 2102 (MEDIUM)
 UNLESS OTHERWISE SPECIFIED.
 3) ROUND-OFF ALL SHARP CORNERS WITH R0.3 MM.
 4) ALL EDGES, CORNERS AND SLOTS SHALL BE BURR FREE.
- 3) FINISH : BOTH PARTS TO BE ANODISED TO 15 MICRONS (MINIMUM) AS PER IS:1868
 (AC 15 GRADE) AFTER ALL FABRICATION STEPS.

INVENTORY NO.	SIGN & DATE	REF. DRG.NO.	COPYRIGHT AND CONFIDENTIAL				
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<p>DEPT. SCPV CODE 439</p> <p>FOR UNSPECIFIED-TOLERANCES REFER ED 0230499</p> <p>SCALE NTS</p> <p>WEIGHT(KG)</p> <p>REF. TO ASSY. DRG.</p> <p>ITEM NO.</p>	<p>TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT</p> <p>SPV POWER PLANT - CORP R&D</p>	<p>DRN SAN</p> <p>QKD NAR</p> <p>APPD SK</p> <p>REF. TO ASSY. DRG.</p> <p>ITEM NO.</p>	<p>NAME</p> <p>SIGN.</p> <p>DATE</p> <p>NO. OF VARI</p>	<p>NO. OF REV.</p> <p>00</p>
<p>REV. 00</p>				
<p>TITLE</p> <p>10x270W PV MODULES MOUNTING STRUCTURE FOR CORP R&D</p>				
<p>DRAWING NO. 3 679 05 00487</p>				
<p>SHEET NO. 06</p>				
<p>NO. OF SHEETS 07</p>				

ANNEXURE 4



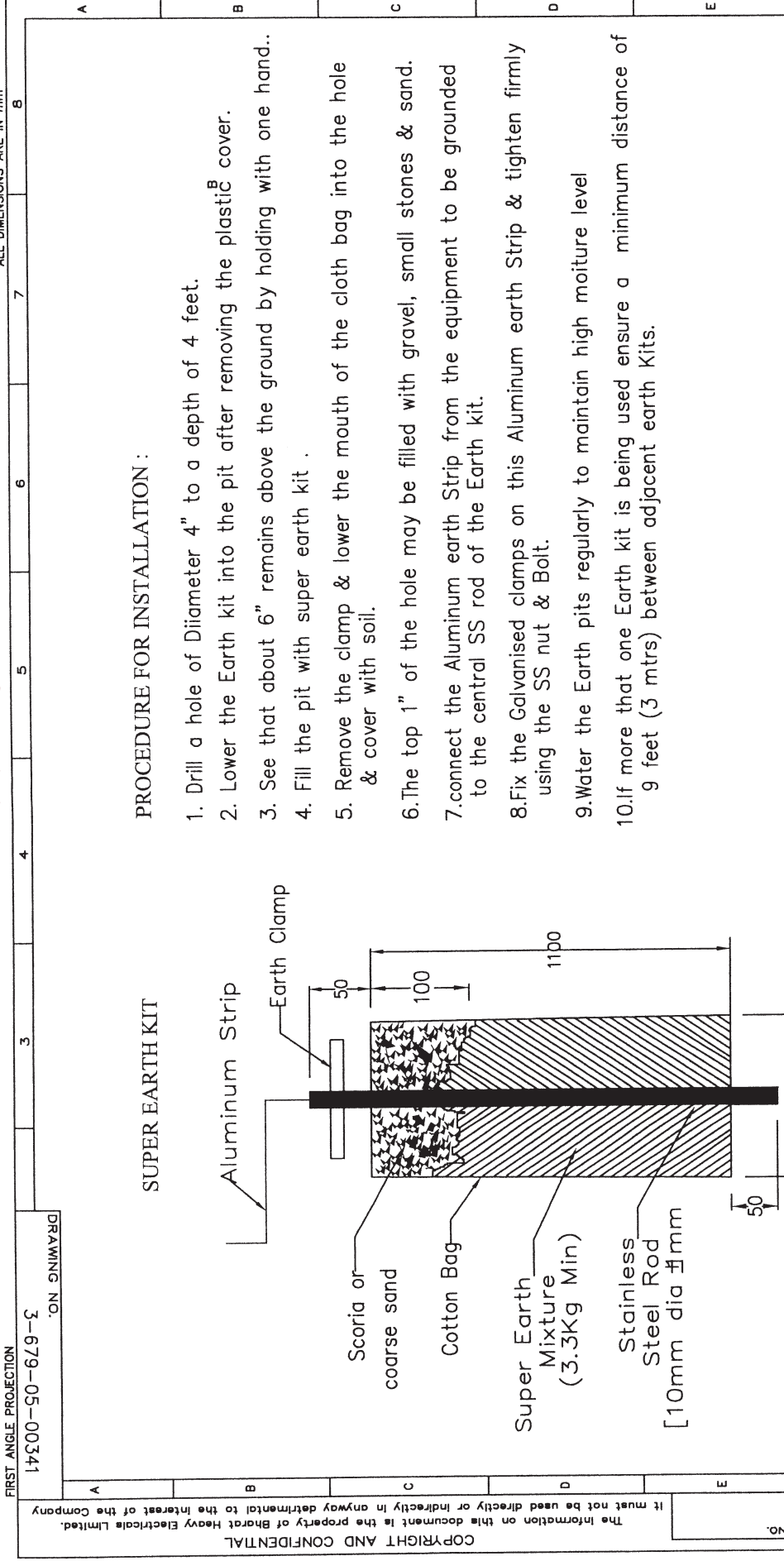
S No	DESCRIPTION	Qty. per SCJB	SCOPE OF SUPPLY
1	DC CIRCUIT BREAKER	1 NO.	BHEL
2	D C SHUNT	1 NO.	BHEL
3	DC SHUNT LEAD CABLE	2 NOS.	BHEL
4	SIGNAL ISOLATOR	1 NO.	BHEL
5	SPD	1 NO.	SCJB SUPPLIER
6	6 Sq. mm CABLE	1 LOT	BHEL
7	12 CORE CABLE	1 LOT	BHEL
8	FITTING, ACCESSORIES AND CONSUMABLES	1 LOT	SUPPLIER

DRAWN BY	CHECKED BY	APPROVED BY	TITLE : WIRING SCHEMATIC FOR STRING CONTROL JUNCTION BOX (SCJB)
B BICHYA	K AJAY	C RAM MOHAN	DRAWING NO: BHEL CRD 256 DI Rev. 0
			DATE: 11-10-2011

157
1

ANNEXURE 5

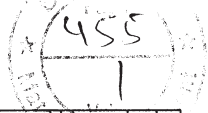
ALL DIMENSIONS ARE IN mm



PROCEDURE FOR INSTALLATION :

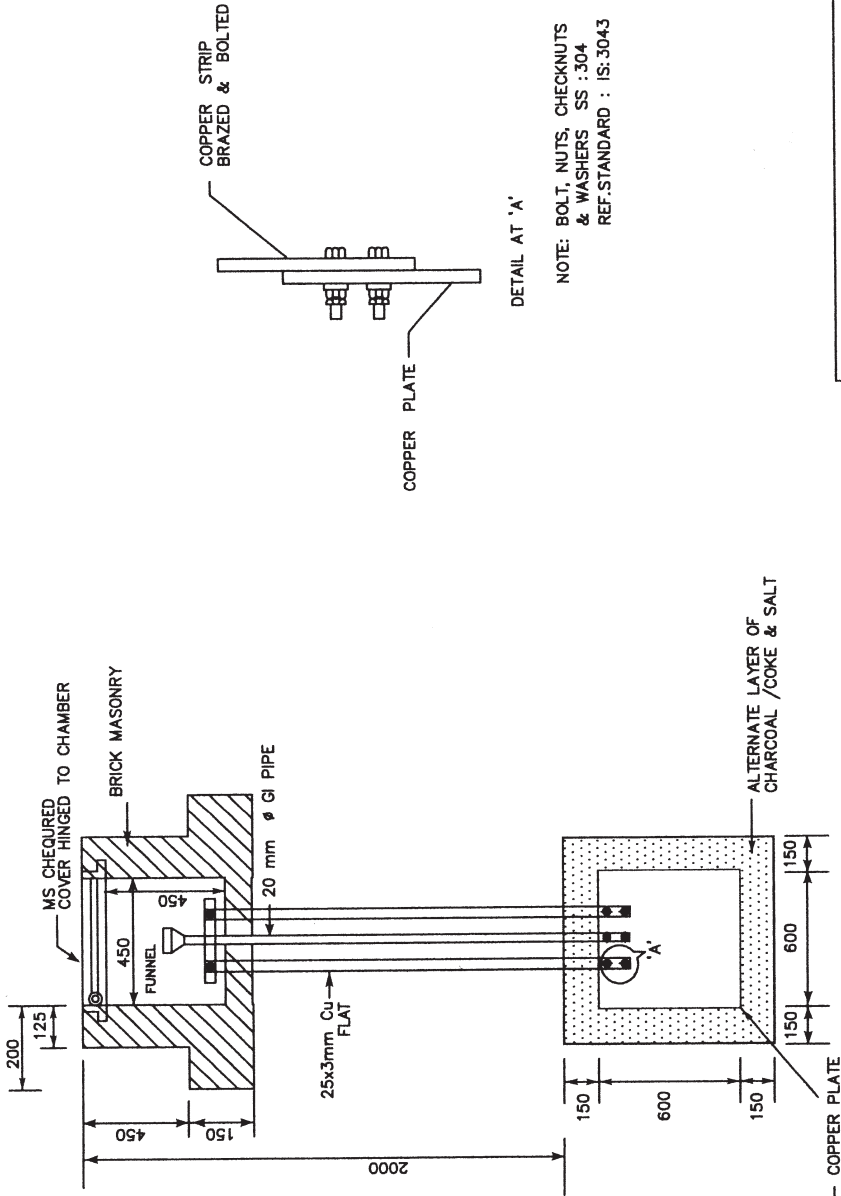
1. Drill a hole of Diameter 4" to a depth of 4 feet.
2. Lower the Earth kit into the pit after removing the plastic cover.
3. See that about 6" remains above the ground by holding with one hand..
4. Fill the pit with super earth kit .
5. Remove the clamp & lower the mouth of the cloth bag into the hole & cover with soil.
6. The top 1" of the hole may be filled with gravel, small stones & sand.
7. connect the Aluminum earth Strip from the equipment to be grounded to the central SS rod of the Earth kit.
8. Fix the Galvanised clamps on this Aluminum earth Strip & tighten firmly using the SS nut & Bolt.
9. Water the Earth pits regularly to maintain high moisture level
10. If more than one Earth kit is being used ensure a minimum distance of 9 feet (3 mtrs) between adjacent earth Kits.

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT SPV POWER PLANT LAKSHADWEEP ELECTRICITY DEPARTMENT		NAME GOBI		SIGN. BNR		DATE KS		No. OF VAR	
DEPT. BHARAT HEAVY ELECTRICALS LIMITED. ELECTRONICS DIVISION, BANGALORE		SCALE FOR UNSPECIFIED-TOLERANCES REFER ED 0230489		WEIGHT(Kg) REF. TO ASSY. DRG.		ITEM NO.		No. OF ITEM	
CODE TITLE		SUPER EARTH KIT		DRAWING NO. 3-679-05-00341		REV.		NO. OF SHEETS	
1 2 3 4 5 6 7 8		1 2 3 4 5 6 7 8		1 2 3 4 5 6 7 8		1 2 3 4 5 6 7 8		1 2 3 4 5 6 7 8	
INVENTORY NO.		SIGN & DATE		REF. DRG. NO.		COPYRIGHT AND CONFIDENTIAL		FORM No. A3-01	



DRAWING NO.
3-679-05-00229

ANNEXURE 5



DETAIL AT 'A'

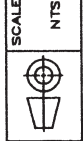
NOTE: BOLT, NUTS, CHECKNUTS
& WASHERS SS : 304
REF. STANDARD : IS:3043

PROJECT : SPV POWER PLANT



BHARAT HEAVY ELECTRICALS LIMITED,
ELECTRONICS DIVISION, BANGALORE

DEPT.
SCPV
CODE
4-38



WEIGHT(Kg) REF. TO ASSY. DRG.

ITEM NO. No. OF
ITER

TITLE

DRAWING NO.

REV.

PLATE EARTHING

3-679-05-00229 00

SHEET NO. 01 NO. OF SHEETS 01

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REV. DATE

REV. DATE

REV. DATE

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