8.0. SPARES AND TOOLS & TACKLES:

Vendor to supply their recommended spares and tools & tackles for 10 years O & M period. In case, the consumption of spares are more than the recommended spares by vendor, additional spares shall be supplied by vendor. A set of required tools and tackles for 10 years O & M period shall be supplied by the vendor.

9.0. DELIVERY REQUIREMENT:

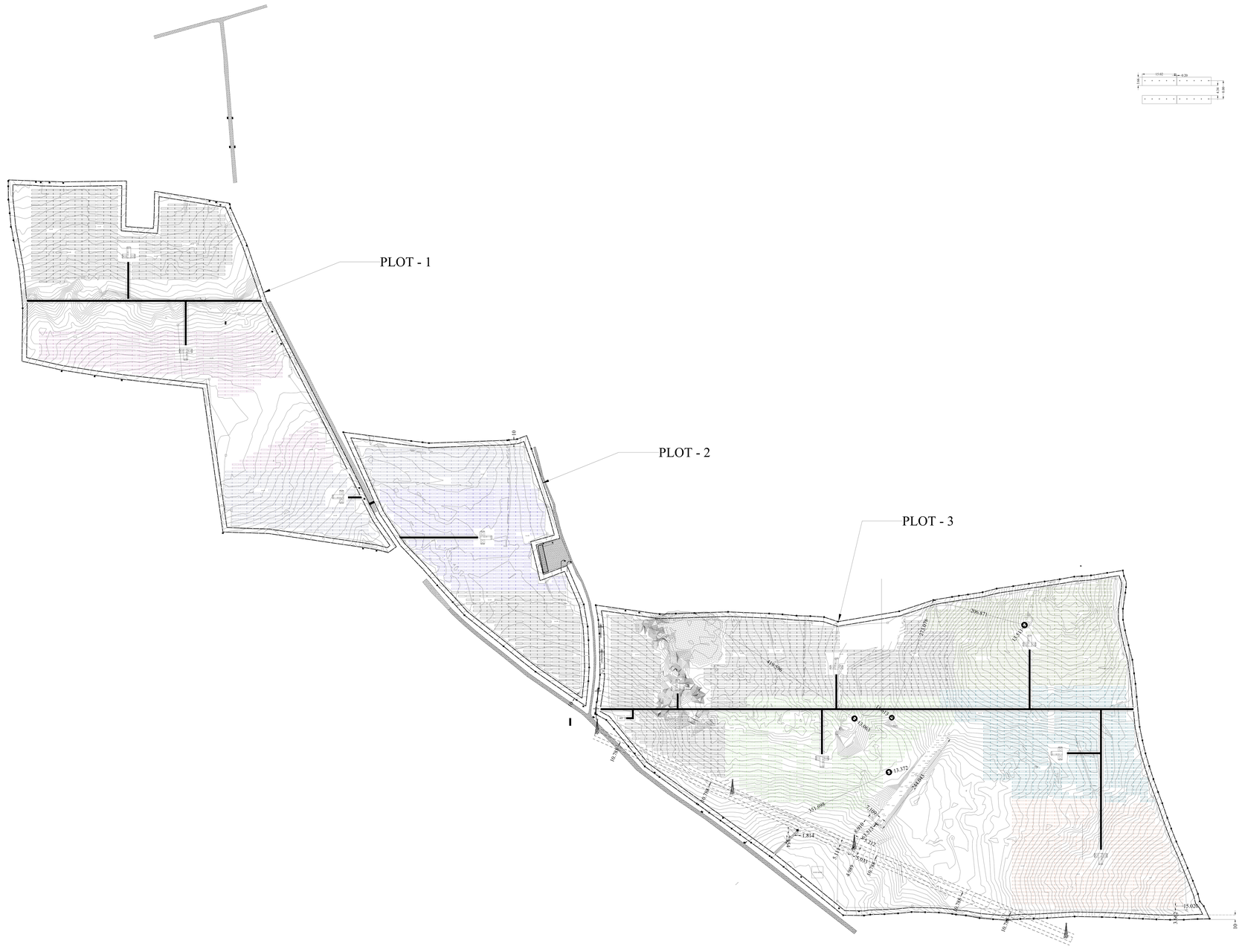
Sr. No	Item Description	Quantity	Unit	Delivery Requirement
1	Vehicle mounted mobile unit with Tank Jet Systems and 100 Mtr Flexible Pipe along with System Arrangement of Water Filling in Mobile Unit as per technical specifications	2	Set	Within 4 weeks from PO
2	Design and supply of PV module cleaning system as per technical specifications	1	Set	Within 6 weeks from design validation/BOM approval
3	I & C of complete PV module cleaning system as per technical specifications	1	AU	Within 6 weeks from site Handover

****

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN mm

DRAWING NO.



NOTES:

1. ARRAY LAYOUT DRAWING IS ONLY FOR DETAILS OF MMS TABLES IN THE PLANT, OTHER DETAILS SHOWN ARE TENTATIVE AND INDICATED TO SHOW CLEARANCES ONLY IN THE PLANT.
2. GATE LOCATION SHOWN IN THE DRAWING IS TENTATIVE.
3. SECURITY ROOM/ SECURITY CABIN WILL BE PROVIDED NEAR THE MAIN GATE. Total 1 No of security Room and 9 Nos of Security Cabins are provided.
4. 10M LEFT BETWEEN BOUNDARY AND ARRAY FOR CONSTRUCTION OF PERIPHERAL ROAD AND OTHER UTILITIES
5. MMS TABLE REMOVED IN THE SHADOW AREA OF LIGHTING ARRESTER

NOTE:

1. HFL OF THE LAND IS 159.55M
2. TOTAL NUMBER OF TABLES - 5810NOS.
3. LENGTH OF TABLE IS 15.020M.
4. NUMBER OF MODULES IN EACH TABLE - 30 MODULES.
5. INTER ROW SPACING - 3.024M.
6. PERIPHERAL ROAD - 4m WIDTH.
7. CLEAR HEIGHT OF BUILDINGS : MCR - 5M IR - 5M
8. ALL DIMENSIONS ARE IN METERS.

PV Module Details
PLOT 1 - 1452 Tables
PLOT 2 - 1141 Tables
PLOT 3 - 3217 Tables
Total - 5810 Tables
Make - ECONESS/WAREE
Rating - 330Wp

LEGEND : -

SYMBOL	DESCRIPTION
	METALLED ROAD
	TREE
	ELECTRIC POST
	HIGH TENSION TOWER WITH WARE
	BUILDING
	LIGHT POST
	WATER BODIES
	FENCING
	VALVE
	WELL
	BM PILLAR
	TBM PILLAR
	PILLAR
	MAJOR CONTOUR
	MINOR CONTOUR
	LIGHTENING ARRESTER

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REF DWG NO.

SIGN & DATE

INVENTORY NO.

REV.	DATE	ALTERED / CHECKED / APPROVED
03	26.11.19	ALTERED / CHECKED / APPROVED

CUSTOMER COMMENTS INCORPORATED

	NAME	SIGN	DATE
DRAWN			26.11.19
CHECKED			26.11.19
APPROVED			26.11.19

DISTRIBUTION OF PRINTS

DEPT.	CODE
SC&PV	439

PROJECT : 50MW SOLAR POWER PROJECT KOUDGAON OSMANABAD
CUSTOMER : MAHAGENCO
CONSULTANT : TUV SUD

BHARAT HEAVY ELECTRICALS LIMITED.
ELECTRONICS DIVISION, BANGALORE

TITLE: PV ARRAY LAYOUT

No. OF SHEETS	01
SHEET No.	01
REV	03

BHEL DRG. No. BHEL-MSPGCL-50MW-004

A0 SIZE

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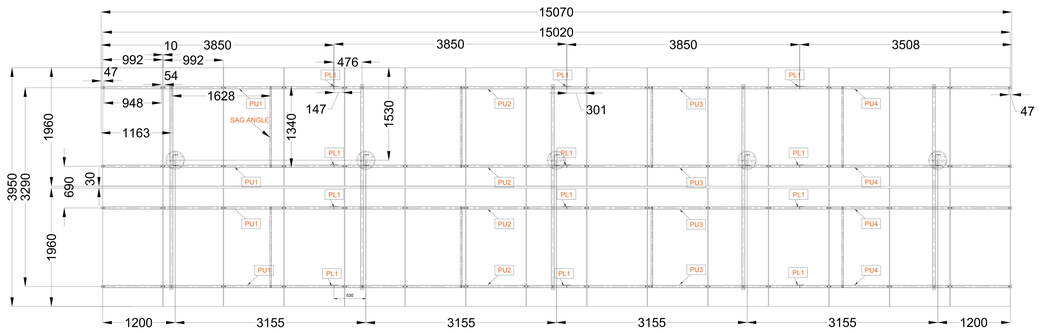
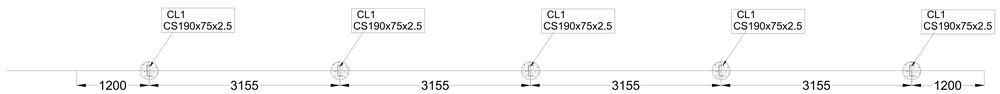
DRG. No.





PLAN OF STRUCTURE (WITH SOLAR MODULE) FOR 0°

SOLAR PANEL DETAIL

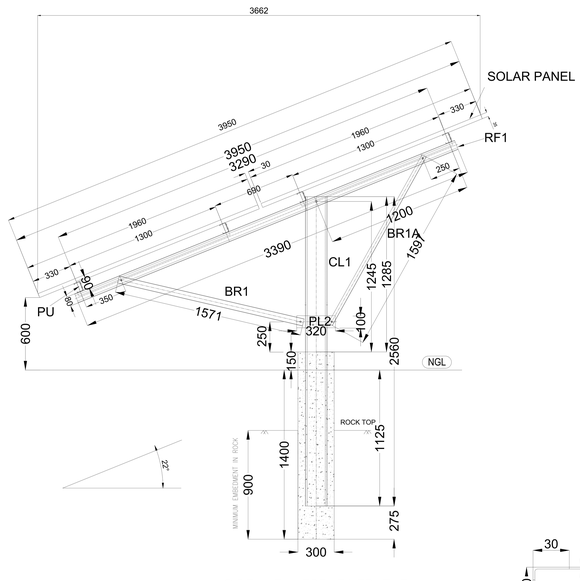
MAKE	SIZE (MM)	Pitch-(Hor)mm	Pitch-(Ver)mm
ASTROHALO	1960X992	948	1300

GENERAL NOTES

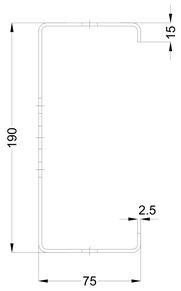
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. DO NOT SCALE THE DRAWING ONLY WRITTEN DIMENSIONS TO BE READ.

NOTES:(This note has to be read alongwith the Bill of material).

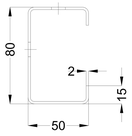
1. DIMENSIONS FOR COLD ROLLED STEEL ANGLE/CHANNEL SECTIONS SHALL BE IN ACCORDANCE WITH IS:811:1987.
2. DIMENSIONS OF PLATES, FLAT BARS SHALL CONFORM TO IS:1730.
3. FABRICATION AND ERECTION SHALL BE CARRIED OUT IN ACCORDANCE WITH IS:800 AND IS:801.
4. ALL MMS MEMBERS TO BE HOT DIP GALVANISATED IN ACCORDANCE WITH IS:2629-1985 AND IS 4759. HOWEVER THE MINIMUM GALVANIZATION THICKNESS TO BE 80 MICRONS AT ANY POINT.
5. GENERAL ASSEMBLY TOLERANCE LINEAR +/- 2MM.
6. GENERAL ASSEMBLY TOLERANCE ANGULAR +/- 1°.
7. HOLE SIZES ARE SHOWN AFTER GALVANIZATION/TREATMENT.
8. REMOVE ALL SHARP AND BURR EDGES.
9. MMS EARTHING ARRANGEMENT TO BE SHOWN IN RELEVANT DRAWING.
10. PROTOTYPE TO BE DONE AS PER CLAUSE MENTIONED IN BHEL PURCHASE SPEC.
11. PILE DEPTH SHALL BE 1.40 M FROM NGL WITH MINIMUM EMBEDMENT OF 0.90 M IN ROCK. PILE PULLOUT TEST TO BE CONDUCTED AND TEST RESULTS TO BE SUBMITTED BEFORE START OF PILE WORK AT SITE. IN CASE NGL IS DEVELOPED BY BACKFILLING, THEN THE PILE DEPTH SHALL BE SUITABLY INCREASED EQUAL TO DEPTH OF BACK FILLING.
12. THE CONCRETE GARDE SHALL BE M25.
13. CASING OR SUITABLE ARRANGEMENT (AS PER SITE CONDITION) SHALL BE PROVIDED, IF FOUND NECESSARY.



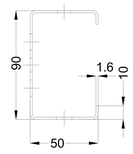
SIDE VIEW FOR FIXED TILT PV MODULE 1960x992x40



CL1-COLUMN
(CS190x75x2.5x15)
SCALE - 20:1

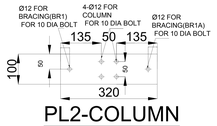


RF1-RAFER
(CS80x50x2x15)
SCALE - 20:1

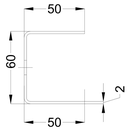


PU-PURLIN
(CS90x50x1.6x10)
SCALE - 20:1

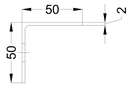
SAG Angle
(30LU30x2)
SCALE - 20:1



PL2-COLUMN
PLATE (320 X100)
SCALE - 20:1



BR1 BRACING
(CU60x50x2)
SCALE - 20:1



BR1A-BRACING
(50LU50x2)
SCALE - 20:1

SCHEDULE OF FASTENERS

Fasteners -
1 set of Fasterners = 1 no. Bolt/screw + 1 no. Hex. Nut + 2 no.s Plain Washers + 1 no. Spring Washer

Sr. No.	location of bolt	length of bolt (mm)	dia. of bolt (mm)	Bolt Description	Material	Grade	Nos for 1 table
1	Column to rafter connection	35	16	M16 X 35	SS304	A2-70	5
2	Bracing1 to Rafter	30	10	M10 X 30	SS304	A2-70	10
3	Bracing1A to Rafter	30	10	M10 X 30	SS304	A2-70	10
4	Bracing1 to column plate	30	10	M10 X 30	SS304	A2-70	10
5	Bracing1A to column plate)	30	10	M10 X 30	SS304	A2-70	10
6	Rafter to purlin	30	10	M10 X 30	SS304	A2-70	20
7	Purlin Splice conn.	30	10	M10 X 30	SS304	A2-70	64
8	Column Plate connection	30	10	M10 X 30	SS304	A2-70	20
9	Sag angle connection	25	8	M8 X 25	SS304	A2-70	16
10	Module Bolts	20	6 or 8	M6/M8 X20	SS304	A2-70	120

PROJECT TITLE : 50 MWp SOLAR POWER PROJECTS AT KOUDGAON, OSMANABAD.

CLIENT : MAHAGENCO

CONSULTANT: TUV SUD

REV.	DATE	ALTERED / CHECKED / APPROVED	REV.	DATE	ALTERED / CHECKED / APPROVED
04	07.11.19	COMPLIANCE TO CUSTOMER'S COMMENTS	04	07.11.19	COMPLIANCE TO CUSTOMER'S COMMENTS

	NAME	SIGN	DATE
DRAWN			
CHECKED			
APPROVED			

DISTRIBUTION OF PRINTS

DEPT.	CODE
SC&PV	439

BHARAT HEAVY ELECTRICALS LIMITED.
ELECTRONICS DIVISION, BANGALORE

TITLE: MODULE MOUNTING STRUCTURE (MMS)- GA AND FOUNDATION DETAILS

No. OF SHEETS	01
SHEET No.	01
REV	04

BHEL DRG. No. BHEL-MSPGCL-50MW-008

REF. DRG. No. | SIGN. & DATE | INVENTORY No.