



भारतीय प्रौद्योगिकी संस्थान इन्दौर  
सिमरोल, खण्डवा रोड, इन्दौर, भारत, पिन - 453 552  
Indian Institute of Technology Indore  
Simrol, Khandwa Road, Indore, India PIN - 453 552

IIT Indore

**Certificate by the Mechanical and Civil Engineering Department for MMS**

This is to certify that the MMS structure drawings No. 4800026385, 4800026389, and 4800026383, 4800026557, 4800026556, and 4800026554 (copy enclosed) supplied by M/S Shakti Energy Solutions private limited is evaluated at our Mechanical and Civil Engineering Department facility at Indian Institute of Technology (IIT), Indore and it is found superior to the MMS structure specified in the Specification of Solar Water Pumping System notified by the Ministry of New and Renewable Energy (MNRE) vide F. No: 41/3/2018-spv Division dated 17/07/2019 (Clause 3.5.1).

The following are the changes when compared to the MNRE's MMS suggestive design: -

S. No.	According to the MNRE MMS	According to the vendor MMS
1.	2- PV Module MMS (4800026166)	2- PV Module MMS (4800026385)
2.	6- PV Module MMS (4800024837)	6- PV Module MMS (4800026389)
3.	10- PV Module MMS (4800024839)	10- PV Module MMS (4800026383)
4.	NA	3- PV Module MMS (4800026557)
5.	04 - PV Module MMS (4800026168)	4- PV Module MMS (4800026556)
6.	08 - PV Module MMS	08- PV Module MMS (4800026554)

These are the following improvements in the MMS design submitted by the vendor over the MNRE's MMS suggestive design: -

In all the six stated design drawings above the C-Type purlin is replaced with Z-purlin for more strength

*Note: The drawings with the abovementioned design improvement are attached.*

**Dr. Ankur Miglani**  
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Simrol, Khandwa Road, Indore 453 552, India

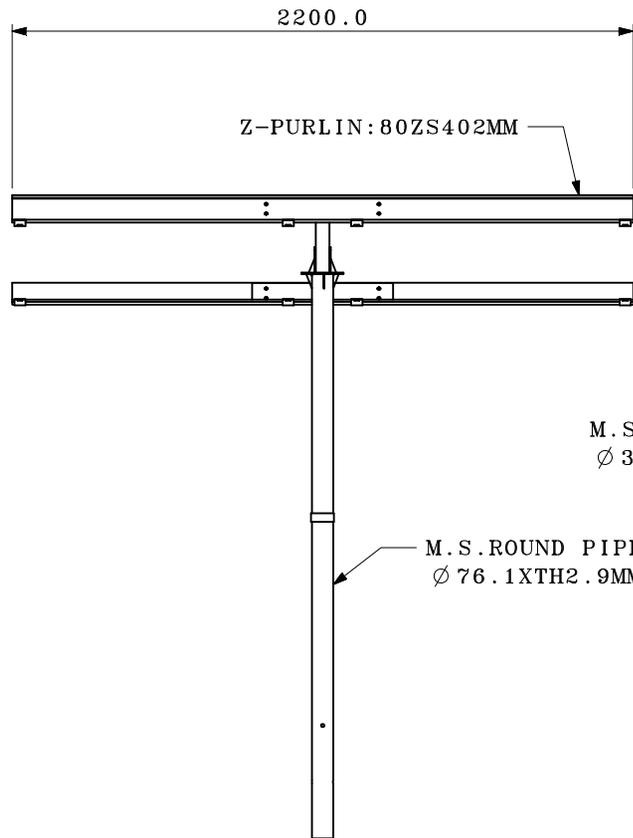
**Dr. Sandeep Chaudhary**  
Professor  
Department of Civil Engineering  
Indian Institute of Technology Indore  
Simrol, Indore 453552

**Dr. Pavan Kumar Kankar**  
Associate Professor  
Department of Mechanical Engineering  
IIT Indore

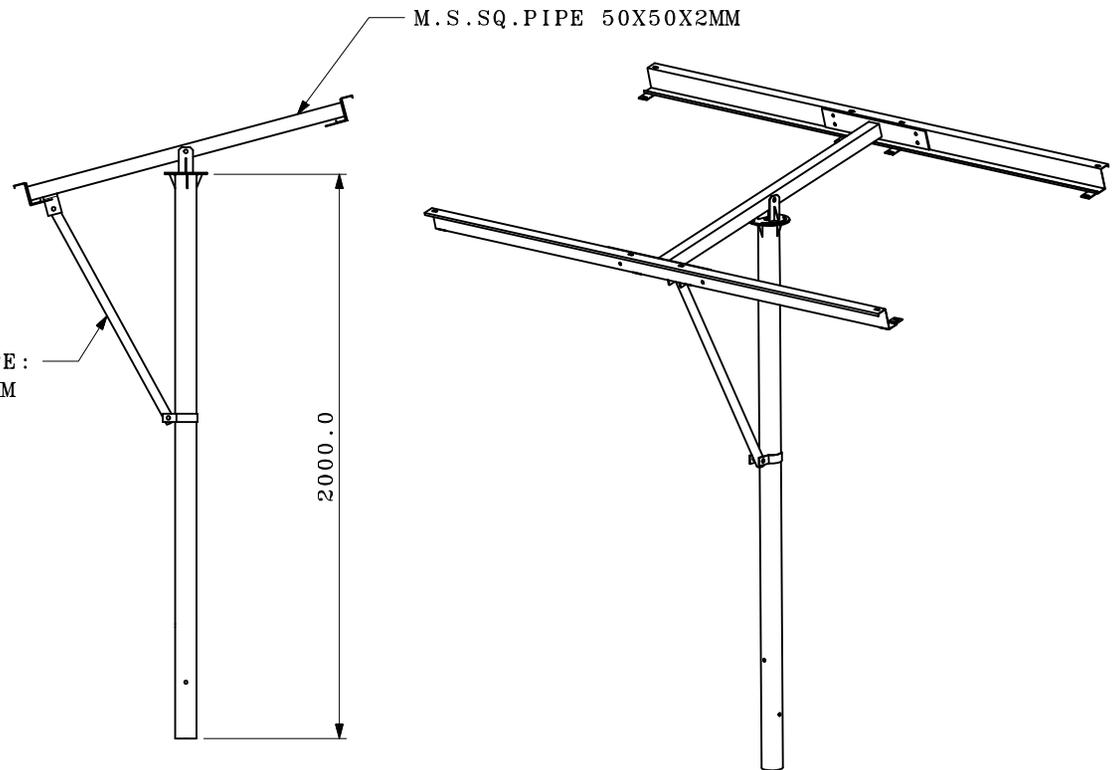
Signature of the concerned authority

Date: 17 Jan. 2022

Place: IIT Indore



FRONT VIEW



SIDE VIEW

ISOMETRIC VIEW

GENERAL NOTE :-

- COMPONENT SHOULD BE MIN. 80 $\mu$ m HOT DEEP GALVANIZED COATED. CONFIRMING TO :-  
IS 2629: HOT DEEP GALVANIZING PRACTICE  
IS 2633: UNIFORMITY OF GALVANIZING COATING  
IS 4759: HOT DIP ZINC COATING OF STRUCTURAL STEEL
- WELDING SHOULD BE CHECKED CONFIRMING TO :-  
IS 822: PROCEDURE FOR INSPECTION OF WELDS.
- ALL DIMENSIONS IS IN MM.
- ALL STEEL SECTIONS SHALL BE THOROUGHLY STRAIGHTENED & WIRE BRUSHED TO ENSURE COMPLETE REMOVAL OF RUST & SCALE.
- DESIGN IS CONFIRMING TO IS800:2007
- WIND LOADING AS PER IS 875:2015
- THE BASIC WIND SPEED IS 150 KM/HR AS MENTIONED IN MNRE SPECIFICATION CIRCULAR NO. F NO. 41/3/2018-SPV DIVISION DATED 17/07/2019

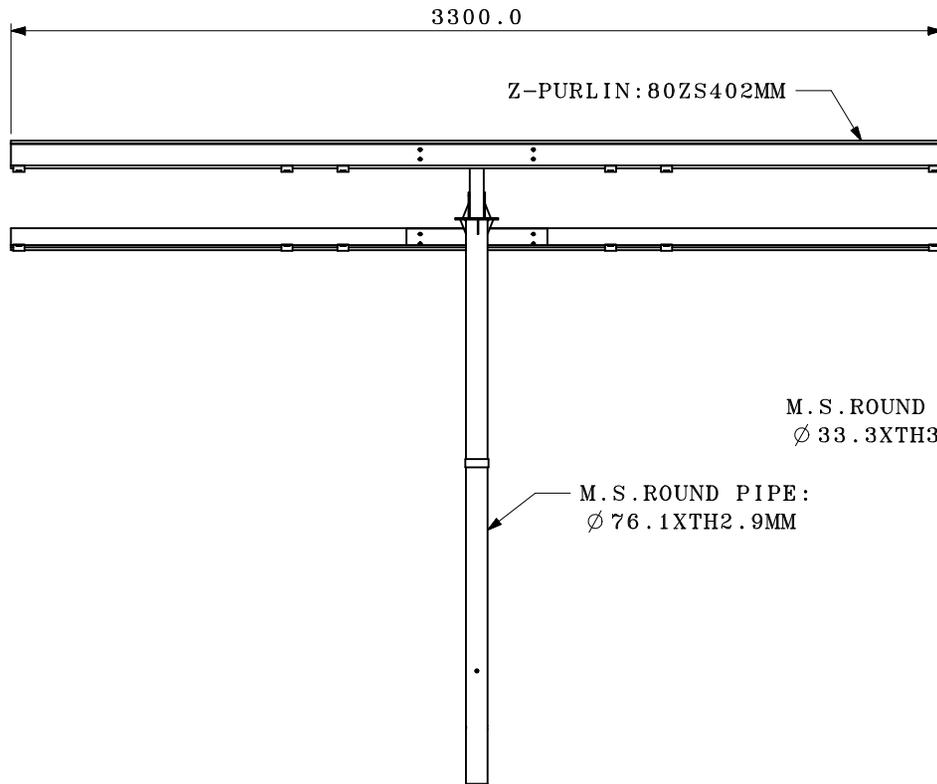
*Ankur Miglani*  
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Assistant Professor  
Department of Mechanical Engineering  
Indian Institute of Technology Indore  
Simrol, Khandwa Road, Indore 453 552, India

07 July 2021

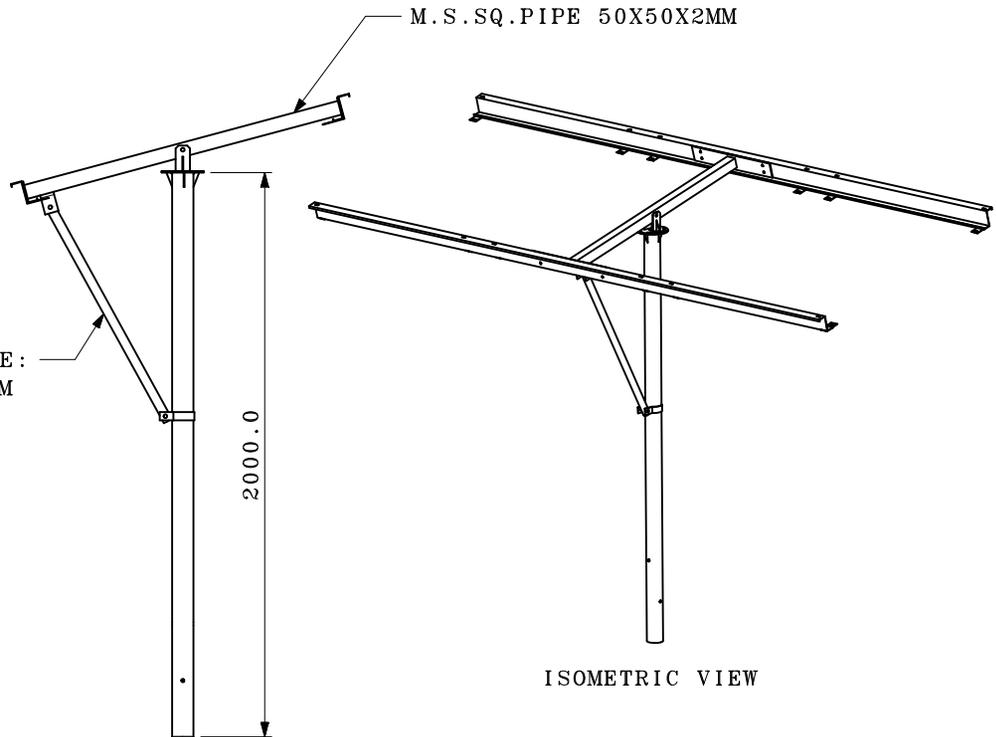
*Pavan Kumar Kankar*  
Dr. Pavan Kumar Kankar  
Associate Professor  
Department of Mechanical Engineering  
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*Sandeep Chaudhary*  
Dr. Sandeep Chaudhary  
Professor  
Department of Civil Engineering  
Indian Institute of Technology Indore  
Simrol, Indore 453552

1) REMOVE SHARP EDGES 2) DRAWING NOT TO BE SCALE 3) OPEN TOLERANCE ARE $\pm 0.2$		REV.-R1	DESCRIPTION:-PURLIN THICKNESS CHANGED AS PER STAAD RESULT			
ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED					NAME	DATE
TITLE :- GAD OF SSMT 02-PLATE-F (4132018)					DRAWN	DEEPAK 25.05.21
					REVISION	DEEPAK 05.07.21
	SCALE	MATERIAL	WEIGHT	APPROVED	SUNITA 05.07.21	
	NTS	IS 2062/IS4923	34.0KG	SHEET	1 OF 2	
					DRG.NO.	4800026385 R1



FRONT VIEW



SIDE VIEW

ISOMETRIC VIEW

GENERAL NOTE :-

1. COMPONENT SHOULD BE MIN. 80µm HOT DEEP GALVANIZED COATED. CONFIRMING TO :-  
IS 2629: HOT DEEP GALVANIZING PRACTICE  
IS 2633: UNIFORMITY OF GALVANIZING COATING  
IS 4759: HOT DIP ZINC COATING OF STRUCTURAL STEEL
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IS 822: PROCEDURE FOR INSPECTION OF WELDS.
3. ALL DIMENSIONS IS IN MM.
4. ALL STEEL SECTIONS SHALL BE THOROUGHLY STRAIGHTENED & WIRE BRUSHED TO ENSURE COMPLETE REMOVAL OF RUST & SCALE.
5. DESIGN IS CONFIRMING TO IS800:2007
6. WIND LOADING AS PER IS 875:2015
7. THE BASIC WIND SPEED IS 150 KM/HR AS MENTIONED IN MNRE SPECIFICATION CIRCULAR NO. F NO. 41/3/2018-SPV DIVISION DATED 17/07/2019

*Pavan*

Dr. Pavan Kumar Kankar  
Associate Professor  
Department of Mechanical Engineering  
Indian Institute of Technology Indore

*Ankur Miglani*

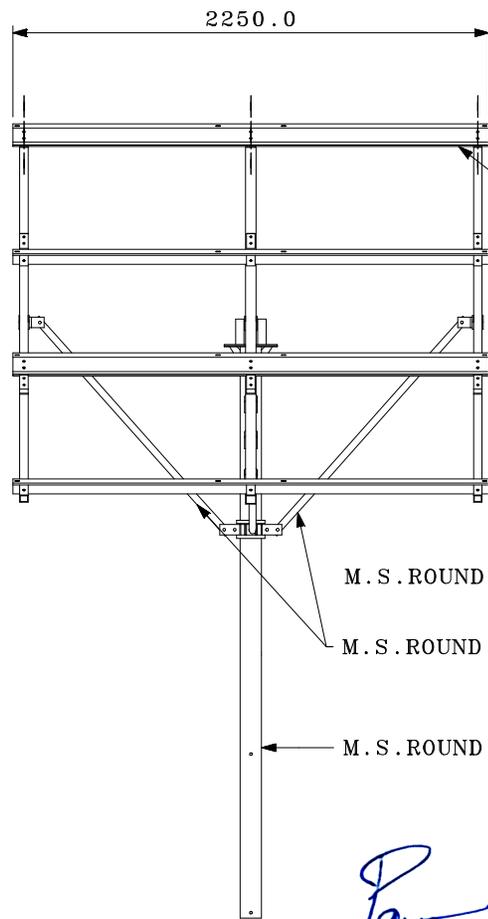
Dr. Ankur Miglani  
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*Sandeep Chaudhary*

Dr. Sandeep Chaudhary  
Professor  
Department of Civil Engineering  
Indian Institute of Technology Indore  
Simrol, Indore 453552

27 July 2021

1) REMOVE SHARP EDGES		REV.-RO	DESCRIPTION:-			
2) DRAWING NOT TO BE SCALE						
3) OPEN TOLERANCE ARE ±0.2						
ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED					NAME	DATE
TITLE :- GAD OF SSMT 03-PLATE-F (4132018)					DRAWN	DEEPAK 24.05.21
					REVISION	
	SCALE	MATERIAL	WEIGHT	APPROVED	SUNITA	24.05.21
	NTS	IS 2062/IS4923	42.6KG	SHEET	1 OF 2	
SHAKTI PUMPS (INDIA) LTD. PITHAMPUR					DRG.NO.	4800026557 RO

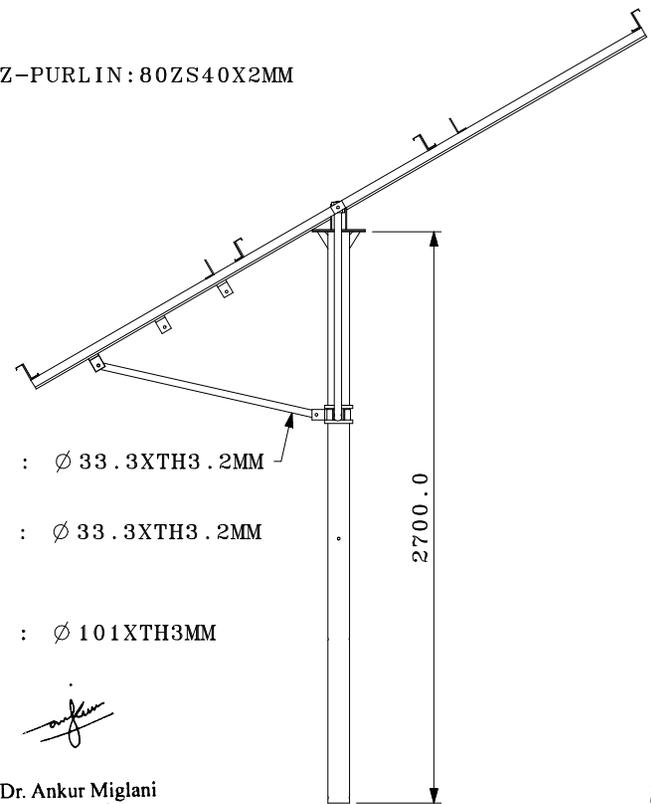


Z-PURLIN : 80ZS40X2MM

M.S. ROUND PIPE :  $\phi$  33.3XTH3.2MM

M.S. ROUND PIPE :  $\phi$  33.3XTH3.2MM

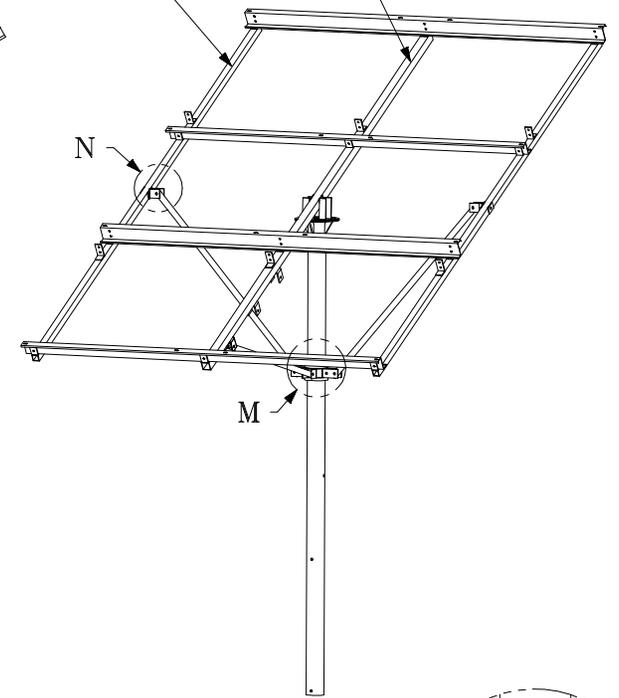
M.S. ROUND PIPE :  $\phi$  101XTH3MM



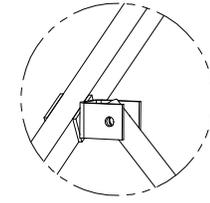
M.S.SQ.PIPE:40X40X3.6MM

M.S.SQ.PIPE:50X50XTH2.9

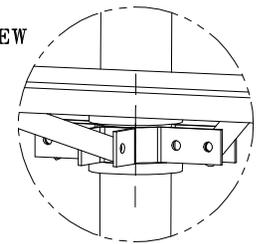
2700.0



ISOMETRIC VIEW



DETAIL N



DETAIL M

*[Signature]*

Dr. Pavan Kumar Kankar  
Associate Professor  
Department of Mechanical Engineering  
Indian Institute of Technology Indore

*[Signature]*

Dr. Ankur Miglani  
Assistant Professor  
Department of Mechanical Engineering  
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Simrol, Khandwa Road, Indore 453 552, India

27 July 2021

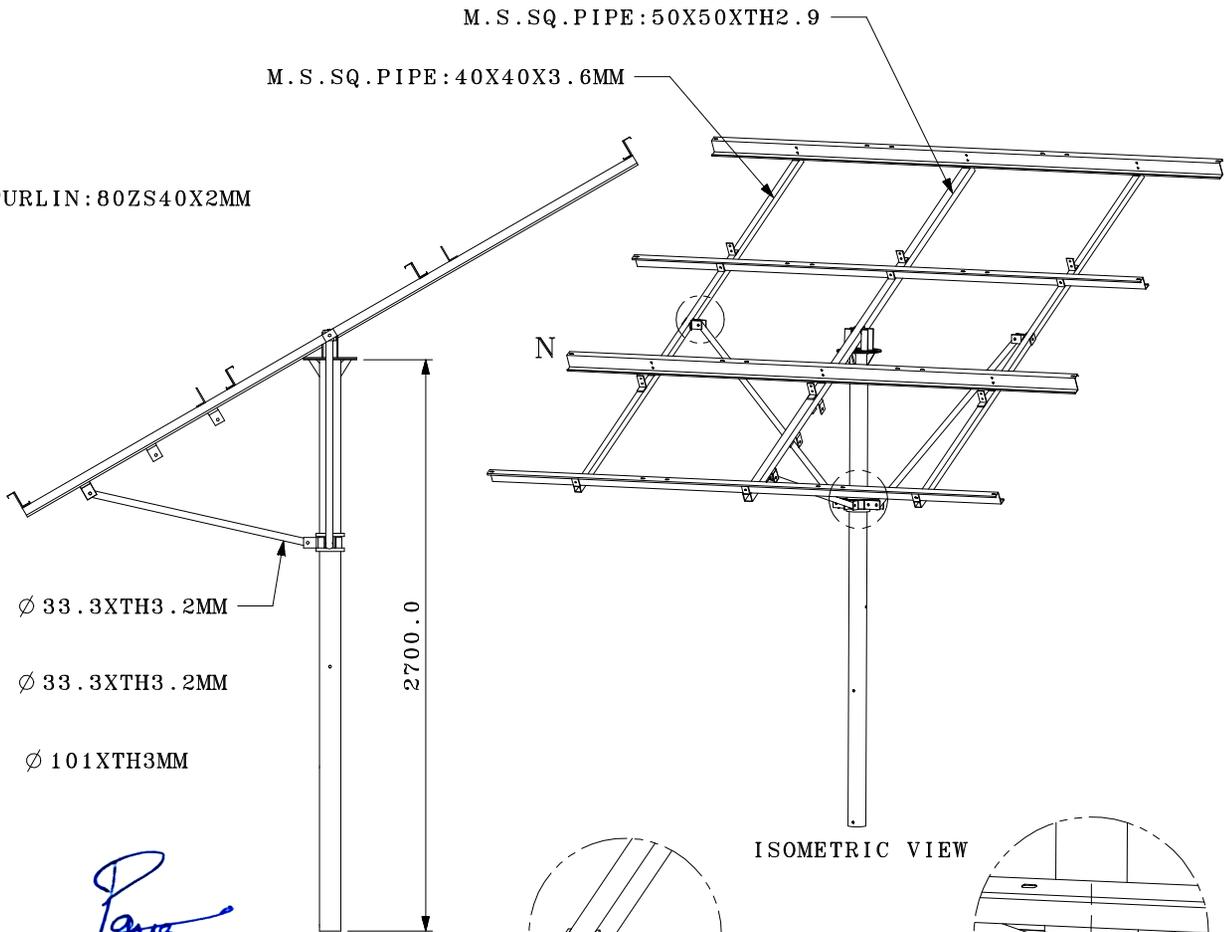
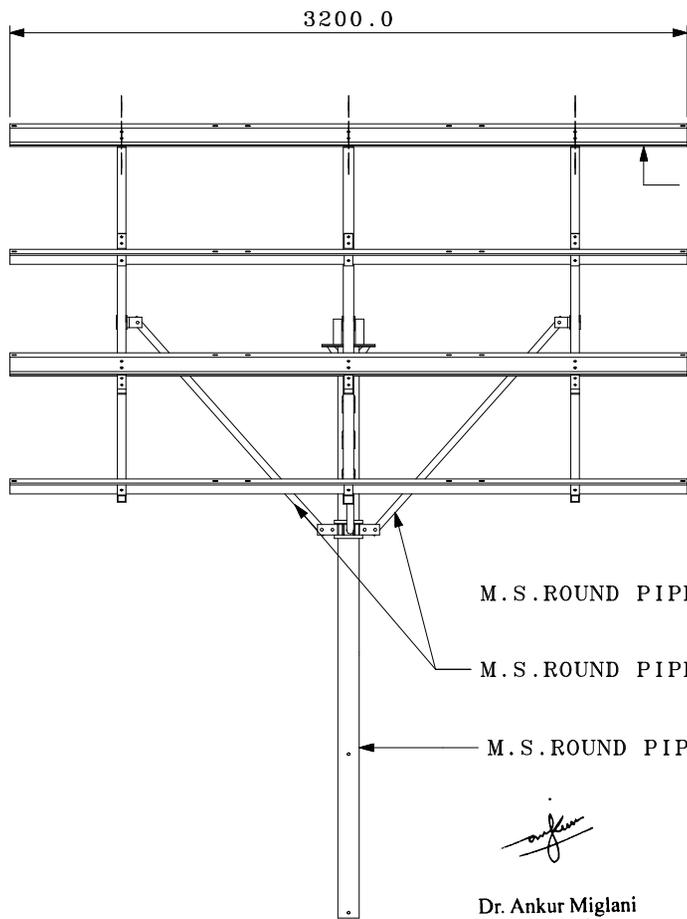
*[Signature]*

Dr. Sandeep Chaudhary  
Professor  
Department of Civil Engineering  
Indian Institute of Technology Indore  
Simrol, Indore 453552

GENERAL NOTE :-

- COMPONENT SHOULD BE MIN. 80 $\mu$ m HOT DEEP GALVANIZED COATED.  
CONFIRMING TO :-  
IS 2629: HOT DEEP GALVANIZING PRACTICE  
IS 2633: UNIFORMITY OF GALVANIZING COATING  
IS 4759: HOT DIP ZINC COATING OF STRUCTURAL STEEL
- WELDING SHOULD BE CHECKED CONFIRMING TO :-  
IS 822: PROCEDURE FOR INSPECTION OF WELDS.
- ALL DIMENSIONS IS IN MM.
- ALL STEEL SECTIONS SHALL BE THOROUGHLY STRAIGHTENED & WIRE  
BRUSHED TO ENSURE COMPLETE REMOVAL OF RUST & SCALE.
- DESIGN IS CONFIRMING TO IS800:2007
- WIND LOADING AS PER IS 875:2015
- THE BASIC WIND SPEED IS 150 KM/HR AS MENTIONED IN  
MNRE SPECIFICATION CIRCULAR NO. F NO. 41/3/2018-SPV DIVISION DATED 17/07/2019

1) REMOVE SHARP EDGES		REV.-RO	DESCRIPTION:			
2) DRAWING NOT TO BE SCALE						
3) OPEN TOLERANCE ARE $\pm 0.2$						
ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED					NAME	DATE
TITLE :-GAD OF SSMT 04-PLATE-F (4132018)					DRAWN	DEEPAK 24.05.21
					REVISION	
	SCALE	MATERIAL	WEIGHT		APPROVED	SUNITA 24.05.21
	NTS	IS 2062/IS4923	113.0kg		SHEET	1 OF 1
					DRG.NO.	4800026556 RO



Dr. Ankur Miglani  
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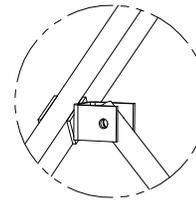
07 July 2021

*[Signature]*

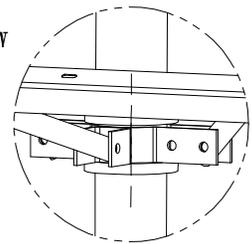
Dr. Pavan Kumar Kankar  
Associate Professor  
Department of Mechanical Engineering  
Indian Institute of Technology Indore

*[Signature]*

Dr. Sandeep Chaudhary  
Professor  
Department of Civil Engineering  
Indian Institute of Technology Indore  
Simrol, Indore 453552



DETAIL N

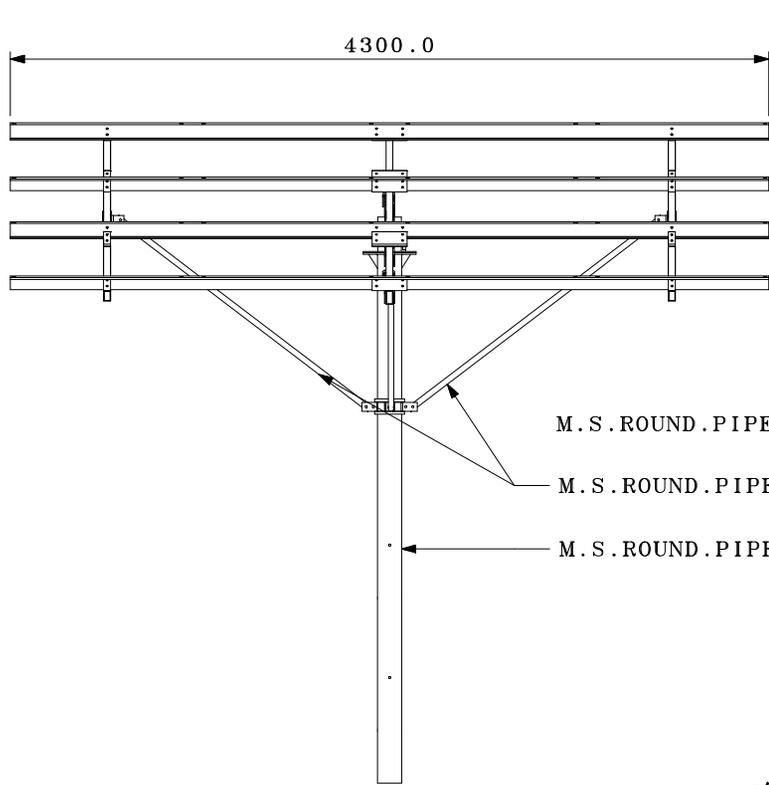


DETAIL M

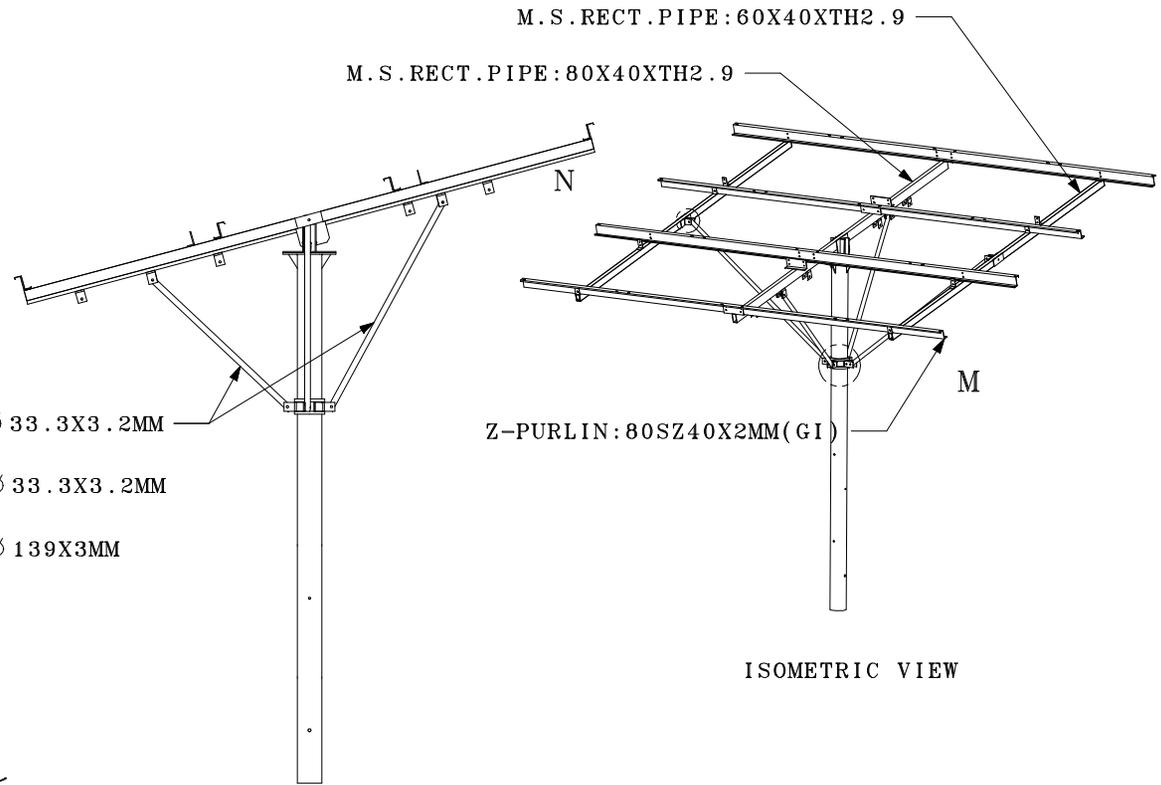
GENERAL NOTE :-

- COMPONENT SHOULD BE MIN. 80 $\mu$ m HOT DEEP GALVANIZED COATED. CONFIRMING TO :-  
IS 2629: HOT DEEP GALVANIZING PRACTICE  
IS 2633: UNIFORMITY OF GALVANIZING COATING  
IS 4759: HOT DIP ZINC COATING OF STRUCTURAL STEEL
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- DESIGN IS CONFIRMING TO IS800:2007
- WIND LOADING AS PER IS 875:2015
- THE BASIC WIND SPEED IS 150 KM/HR AS MENTIONED IN  
MNRE SPECIFICATION CIRCULAR NO. F NO. 41/3/2018-SPV DIVISION DATED 17/07/2019

1) REMOVE SHARP EDGES		REV.-R1	DESCRIPTION: THICKNESS OF PURLIN CHANGED AS PER STAAD RESULT	
2) DRAWING NOT TO BE SCALE				
3) OPEN TOLERANCE ARE $\pm 0.2$				
ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED				
TITLE :-GAD OF SSMT 06-PLATE-F (4132018)			NAME	DATE
			DRAWN	DEEPAK 03.06.21
			REVISION	DEEPAK 05.07.21
			APPROVED	SUNITA 05.07.21
			SHEET	1 OF 1
			DRG.NO.	4800026389 R1



FRONT VIEW



ISOMETRIC VIEW

*Signature*

SIDE VIEW

*Signature*

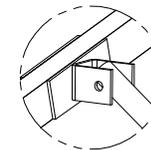
Dr. Pavan Kumar Kankar  
Associate Professor  
Department of Mechanical Engineering  
Indian Institute of Technology Indore

Dr. Ankur Miglani  
Assistant Professor  
Department of Mechanical Engineering  
Indian Institute of Technology Indore  
Simrol, Khandwa Road, Indore 453 552, India

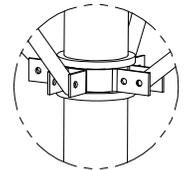
27 July 2021

*Signature*

Dr. Sandeep Chaudhary  
Professor  
Department of Civil Engineering  
Indian Institute of Technology Indore  
Simrol, Indore 453552



DETAIL N

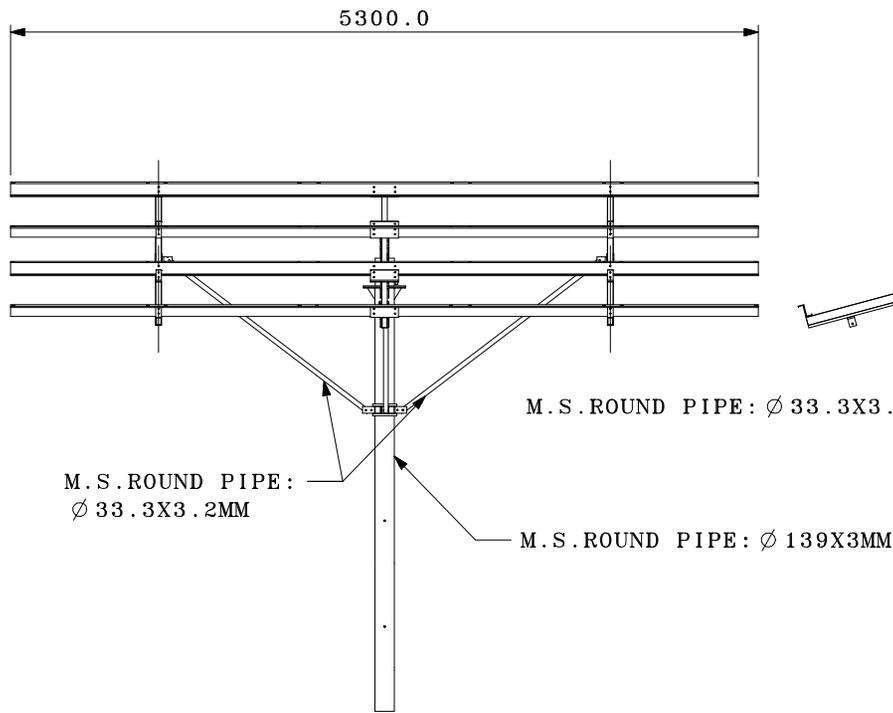


DETAIL M

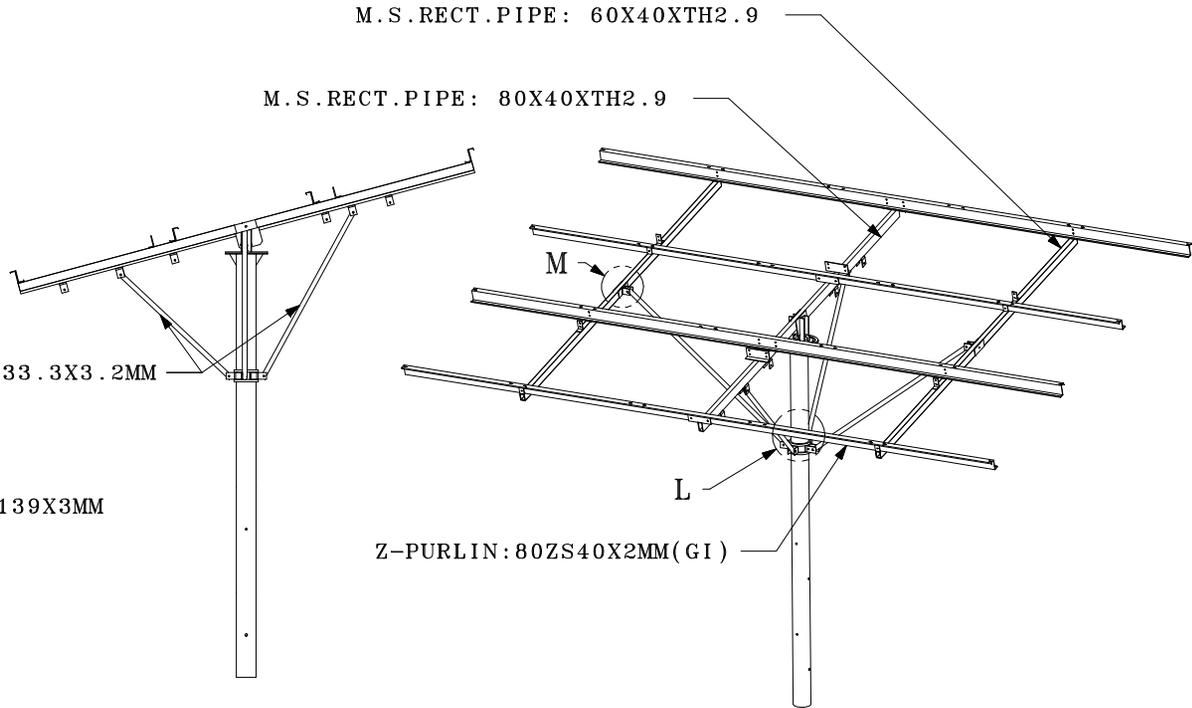
GENERAL NOTE :-

- COMPONENT SHOULD BE MIN.80µm HOT DEEP GALVANIZED COATED. CONFIRMING TO :-  
IS 2629: HOT DEEP GALVANIZING PRACTICE  
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- WIND LOADING AS PER IS 875:2015
- THE BASIC WIND SPEED IS 150 KM/HR AS MENTIONED IN MNRE SPECIFICATION CIRCULAR NO. F NO. 41/3/2018-SPV DIVISION DATED 17/07/2019

1) REMOVE SHARP EDGES 2) DRAWING NOT TO BE SCALE 3) OPEN TOLERANCE ARE ±0.2		REV.-RO	DESCRIPTION:			
ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED					NAME	DATE
TITLE :-GAD OF SSMT 08-PLATE-F (4132018)					DRAWN	DEEPAK 24.05.21
					REVISION	
	SCALE	MATERIAL	WEIGHT	APPROVED	SUNITA	24.05.21
	NTS	IS 2062/IS4923	181kg	SHEET	1 OF 2	
					DRG.NO.	4800026554
						RO



FRONT VIEW



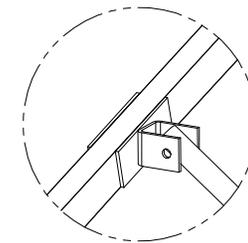
SIDE VIEW

ISOMETRIC VIEW

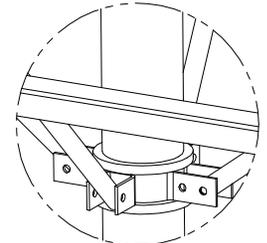
*Sandhu*  
 Dr. Sandeep Chaudhary  
 Professor  
 Department of Civil Engineering  
 Indian Institute of Technology Indore  
 Simrol, Indore 453552

*Ankur*  
 Dr. Ankur Miglani  
 Assistant Professor  
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 Indian Institute of Technology Indore  
 Simrol, Khandwa Road, Indore 453 552, India

*Pavan*  
 Dr. Pavan Kumar Kankar  
 Associate Professor  
 Department of Mechanical Engineering  
 Indian Institute of Technology Indore



DETAIL M



DETAIL L

GENERAL NOTE :-

- COMPONENT SHOULD BE MIN.80µm HOT DEEP GALVANIZED COATED. CONFIRMING TO :-  
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07 July 2021

1) REMOVE SHARP EDGES 2) DRAWING NOT TO BE SCALE 3) OPEN TOLERANCE ARE ±0.2		REV.-R1	DESCRIPTION: THICKNESS CHANGED AS PER MODIFIED STAAD RESULT.			
ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED					NAME	DATE
TITLE :-GAD OF SSMT 10-PLATE-F (4132018)			DRAWN	DEEPAK	24.05.21	
			REVISION	DEEPAK	05.07.21	
	SCALE	MATERIAL	WEIGHT	APPROVED	SUNITA	05.07.21
	NTS	IS 2062/IS4923	190kg	SHEET	1 OF 2	
			DRG.NO.	4800026383	R1	