

## **2X660MW ENNORE SEZ STPP**

### **TECHNICAL SPECIFICATION FOR CABLE TRAYS & ACCESSORIES**

SPECIFICATION No. PE-TS-412-507-E021A  
ISSUE NO.- 01  
REV NO.- 0



BHARAT HEAVY ELECTRICALS LIMITED  
POWER SECTOR  
PROJECT ENGINEERING MANAGEMENT  
NOIDA, INDIA



TECHNICAL SPECIFICATION  
CABLE TRAYS & ACCESSORIES  
2X660MW ENNORE SEZ STPP

PE-TS-412-507-E021A

Issue No: 01

Rev. No. 00

Date : 28/02/2024

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a)	Supply	
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c)	Services	Not Applicable
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### PROJECT INFORMATION


SL.NO	DESCRIPTION	DETAILS
<b>1</b>	<b>METEOROLOGICAL DATA</b>	
1.1	MAXIMUM TEMPERATURE	41.5°C
1.2	MINIMUM TEMPERATURE	24°C
1.3	MAXIMUM RELATIVE HUMIDITY	100%
1.4	MINIMUM RELATIVE HUMIDITY	36%
1.5	AVERAGE ANNUAL RAINFALL	1600 mm
1.6	SEISMIC ZONE (AS PER IS 1893)	ZONE III
1.7	HEIGHT ABOVE MSL	(+) 10.00m above MSL
<b>2</b>	<b>ELECTRICAL DATA</b>	
2.1	AMBIENT TEMPERATURE FOR DESIGN OF ELECTRICAL EQUIPMENT	50°C
2.2	RATED FREQUENCY	50Hz
2.3	FREQUENCY VARIATION	(+) 3% to (-) 5%
2.4	AC VOLTAGE	415V AV
2.5	AC VOLTAGE VARIATION	± 10% for 415V
2.6	DC VOLTAGE	220V DC
2.7	DC VOLTAGE VARIATION	(+) 10% to (-) 15%
2.8	FAULT LEVEL (KA/SEC)	50kA (RMS), 1sec for 415V AC, 25kA FOR 220V DC

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### SCOPE

#### SCOPE OF THIS PACKAGE COVERS THE FOLLOWING:

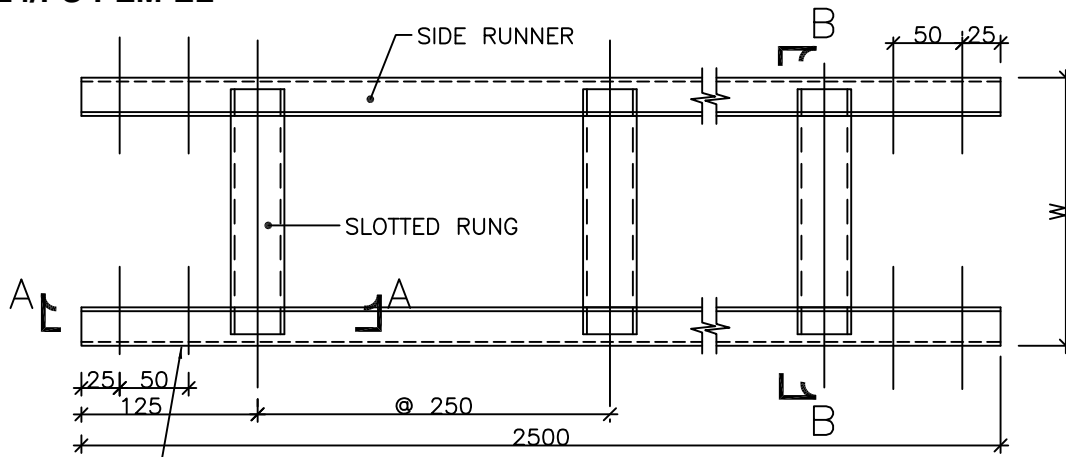
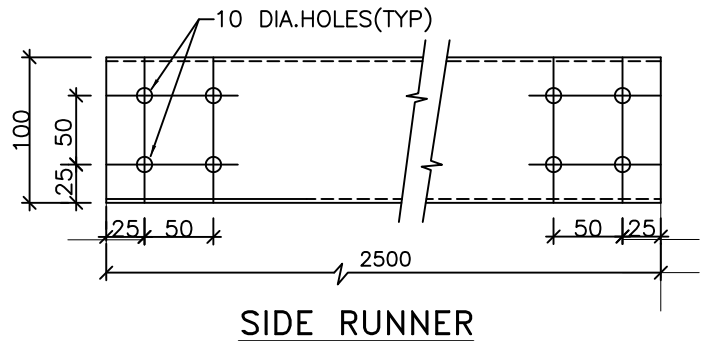
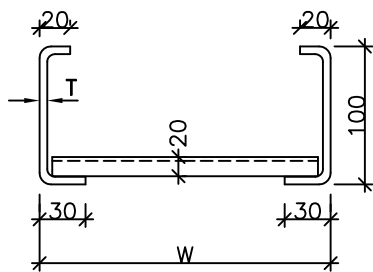
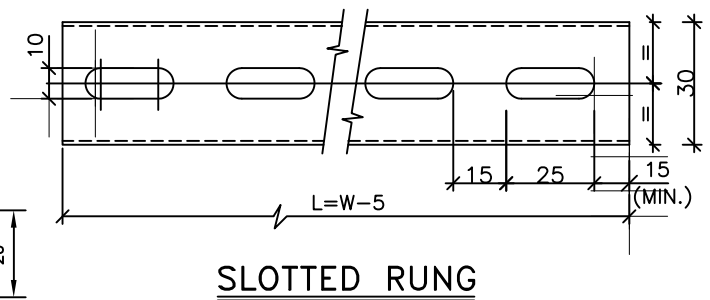
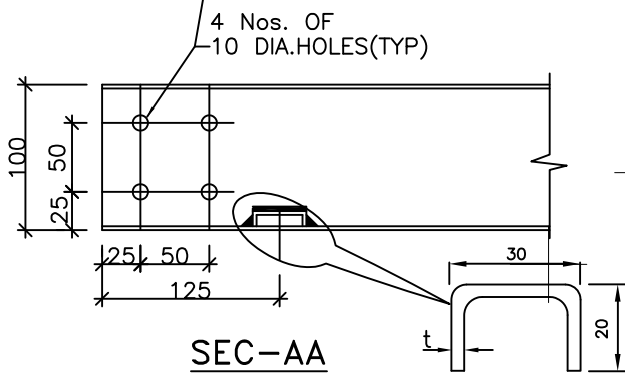
SL.NO	PARAMETERS	REQUIREMENT
1	Supply Including Design, Engineering, Manufacturing Of	YES
a)	Main Supply	YES
b)	Commissioning Spares	NO
2	Painting	NO
3	Inspection & Testing	YES
4	Packing	YES
5	Transportation & Delivery To Site	YES
6	Erection & Commissioning	NO
7	Supervision of Erection & Commissioning	NO
8	Mandatory Spares	NO
9	O & M Service	NO
10	O & M Spares	NO

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<b>GENERAL TECHNICAL REQUIREMENT</b>	
1	It is not the intent to specify herein all the details of design and manufacturing. Bidder shall ensure that the offered equipment confirms in all respects to high standards of design, engineering and workmanship.
2	Bidder shall also ensure that the offered equipment shall comply with all applicable statutory and regulatory requirements.
3	In the event of any conflict between the requirements of two clauses of this specification, documents or requirements of different codes and standards specified, the more stringent requirement as per the interpretation of the owner shall apply.
4	Drawing/document submission shall be through web based Document Management System(DMS) of BHEL. Bidder would be provided access to the DMS for drawing/document submission. Bidder to ensure internet connectivity of min speed of 2Mbps at their end.
5	Drawings/ documents submitted by vendor at any stage shall be complete in all respects. Any incomplete drawing submitted shall be treated as non- submission with delays attributable to vendor. For any clarification/ discussion required to complete the drawings, the bidder shall depute his personnel to BHEL / Customer's Office as per the requirement for across the table submission/ finalizations of drawings.
6	Bidder shall carry out the tests as listed in the Quality Plan.
7	Bidder shall submit Quality Plan in the event of order based on the Quality Plan enclosed therein on compliance route. Inspection / testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc.
8	In case, the bidder is sourcing the item/any component from outside India, the third party inspection shall be arranged by bidder at their cost and shall be deemed to be considered by the bidder in their offer.
9	Nameplates shall be manufactured from stainless steel or aluminium with a matte or satin finish, and engraved with black lettering of a minimum 6 mm height or as per equipment standard whichever is higher
10	Sub vendor list is attached. Any additional sub - vendors proposed by bidder during contract stage shall be subject to BHEL/ Customer/Customer's Consultant approval in the event of order.
11	Mandatory Spares : Wherever the quantities have been indicated for each type, size, thickness, material, radius, range etc., these shall cover all the items supplied and installed and the breakup for these shall be furnished in the bid. In case spares indicated in the list are not applicable to the particular design offered by the bidder, the bidder should offer spares applicable to offered design with quantities generally in line with the approach followed in the mandatory spare list
12	Equipment must be safe, reliable and easy to maintain at all operating condition

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TECHNICAL DATA - PART - A			
SL.NO	DESCRIPTION	UOM	DETAIL
1.0	DESIGN CODES & STANDARDS		
1.1	Hot rolled carbon steel sheet and strip.		IS:1079
1.2	Hexagon head bolts, screws and nuts.		IS:1363
1.3	Stell plates, Sheets, Strips and Flats for Structural and General Engineering Purposes-Dimensions		IS:1730
1.4	Recommended practice for hot dip galvanizing on iron and steel		IS:2629
1.5	Specification for hot dip zinc coatings on structural steel and allied products		IS:4759
1.6	Methods for determination of mass of zinc coating on zinc coated iron and steel articles		IS:6745
1.7	Method for testing uniformity of coating on zinc coated articles		IS:2633
1.8	For Rolling & cutting tolerances of hot rolled steel products		IS:1852
1.9	Galvanised Coating on threaded Fasteners. (Part-XIII)		IS:1367
2	Metal Arc Welding of Carbon and Carbon Manganese Stell Recommendation		IS: 9595
2.0	DESIGN /SYSTEM PARAMETERS		
	As per enclosed Compliance drawings		
3.0	CONSTRUCTION FEATURES		
	As per enclosed Compliance drawings		
4.0	PERFORMANCE PARAMETERS		
	NA		
5.0	INSPECTION/TESTING		
5.1	The inspection will be carried out as per BHEL approved quality plan.		

# COMPLIANCE DRAWINGS

LADDER TYPE CABLE TRAY

W	150	300	450	600
L	145	295	445	595
T	2	2	2	2
t	2	2	2	2

FOR GENERAL NOTES REFER SHEET 11 OF 11

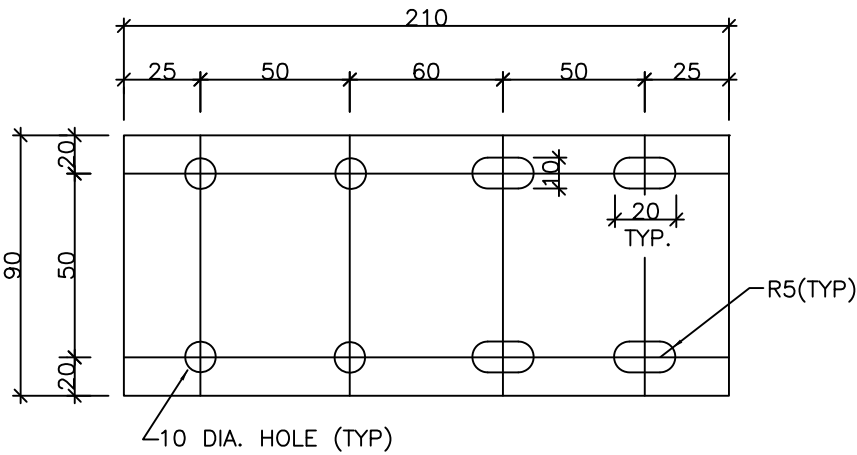


TYPICAL DETAILS OF CABLE TRAYS AND  
ACCESSORIES

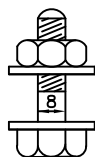
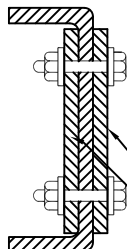
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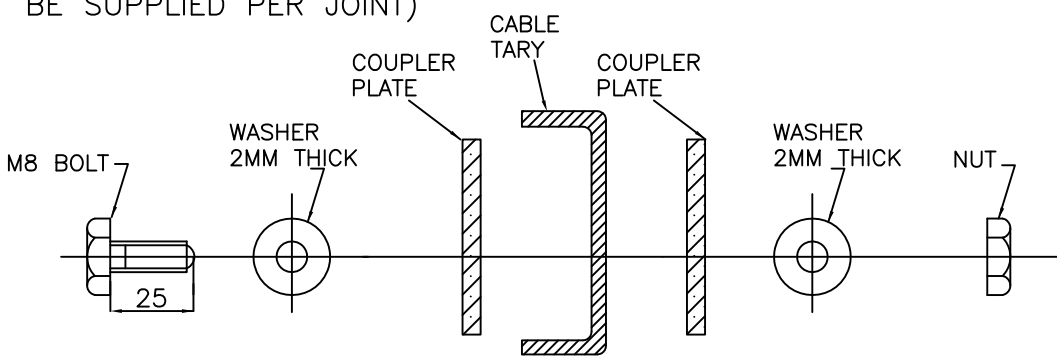
**SIDE COUPLER PLATE FOR  
LADDER/PERFORATED TYPE TRAYS**  
(600/450/300/150W TRAYS)  
QTY. REQUIRED/TRAY SECTION : 4 NOS.



QTY. REQD/TRAY SECTION

- A) 16 NOS. M8 BOLTS
- B) 16 NOS. NUTS
- C) 32 NOS. WASHERS

(2 NOS. COUPLER PLATES  
OF 3 MM THICKNESS TO  
BE SUPPLIED PER JOINT)



SEQUENCE OF M8 BOLT, WASHER, NUT, COUPLER PLATE & CABLE TRAY  
FOR TYPICAL CABLE TRAY JOINT

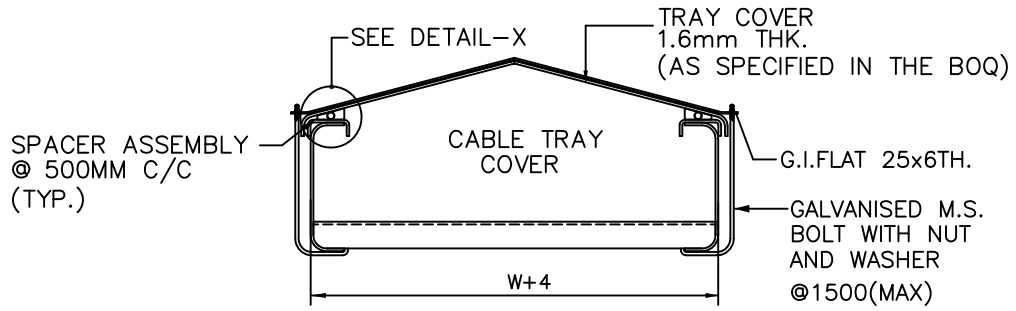
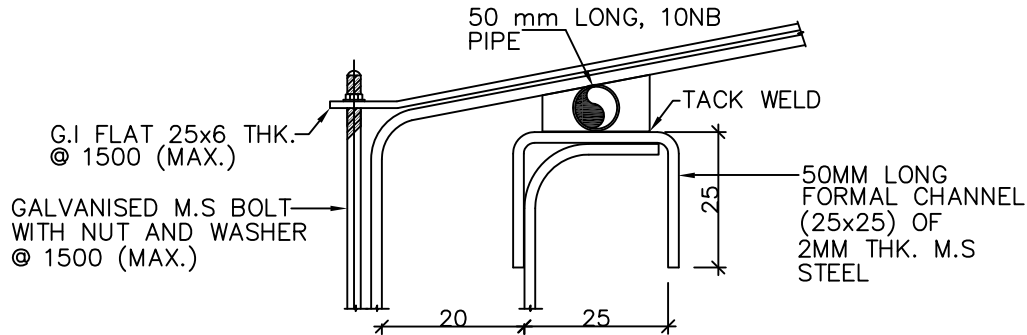
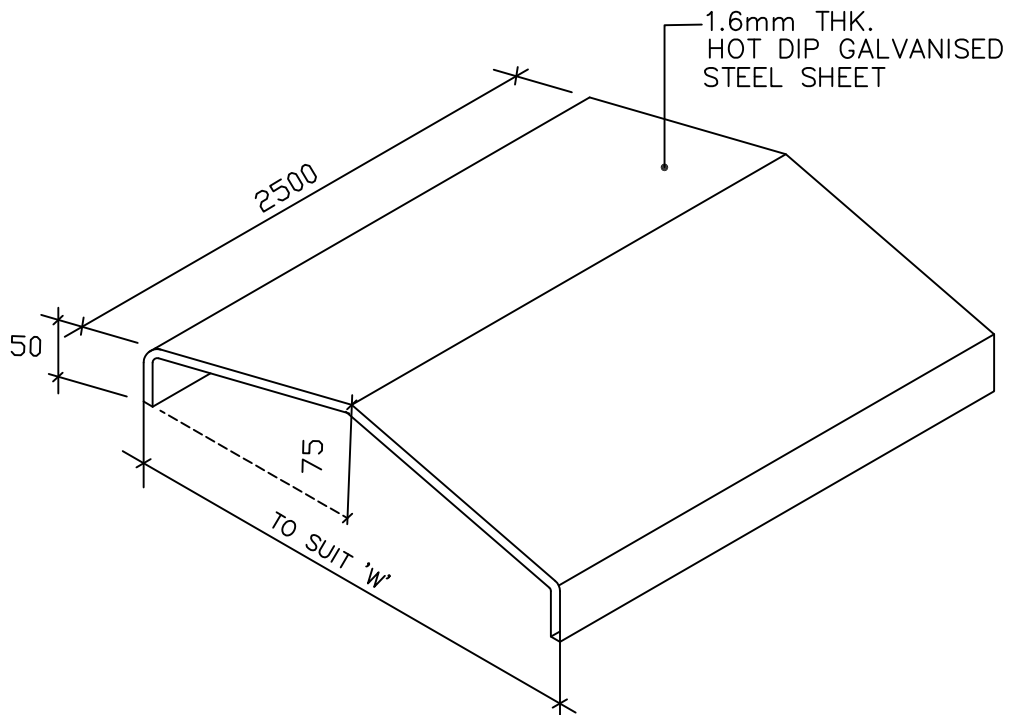
FOR GENERAL NOTES REFER SHEET 11 OF 11



**TYPICAL DETAILS OF CABLE TRAYS AND  
ACCESSORIES**

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COVER FIXING (TYP.)DETAIL-X**CABLE TRAY COVER**

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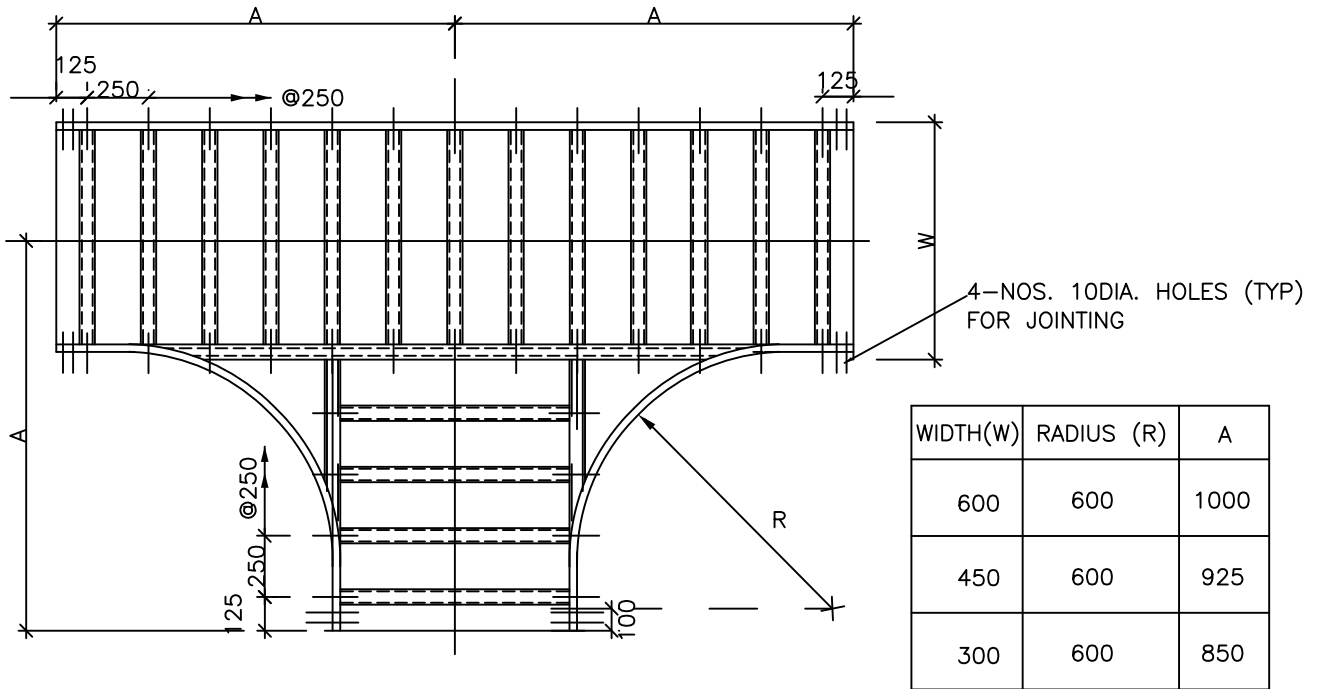
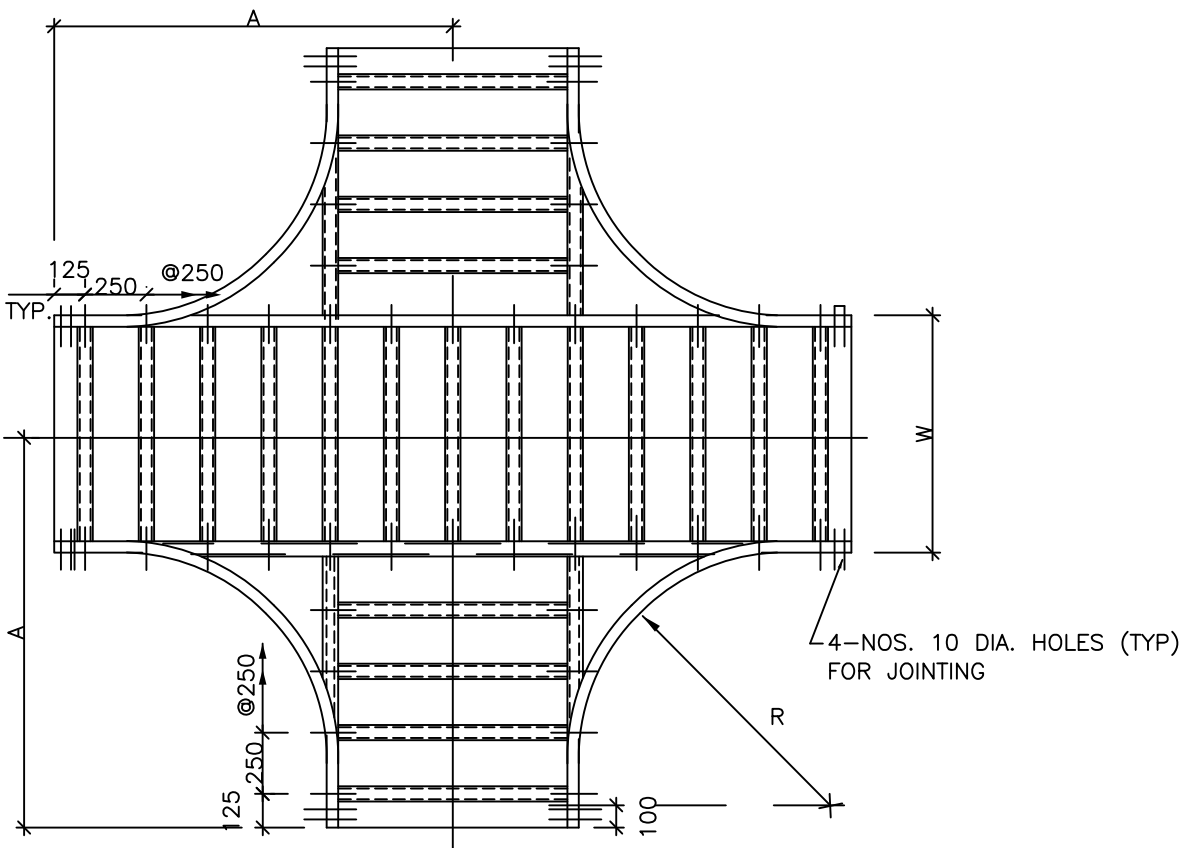


TYPICAL DETAILS OF CABLE TRAYS AND ACCESSORIES

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124283/2024/PS-PEM-EL

HORIZONTAL TEE-PLANHORIZONTAL CROSS-PLANLADDER TYPE ACCESSORIES

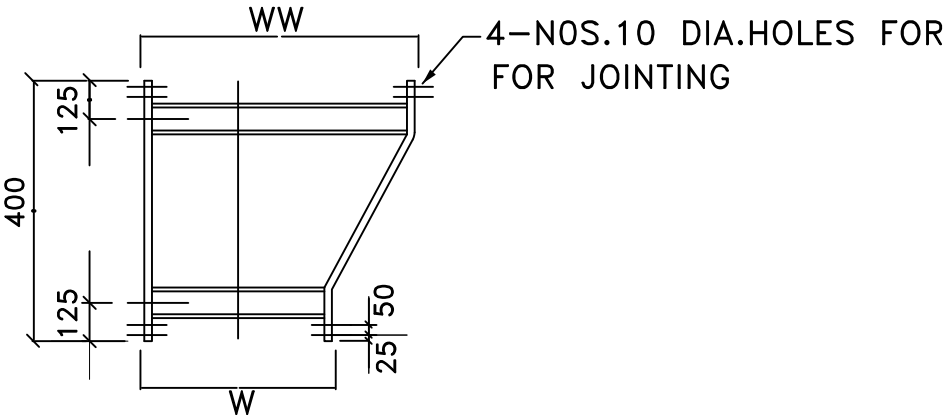
FOR GENERAL NOTES REFER SHEET 11 OF 11



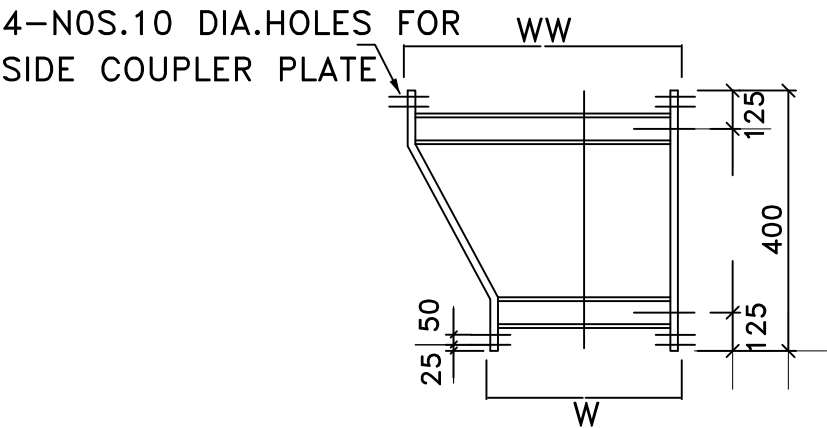
TYPICAL DETAILS OF CABLE TRAYS AND  
ACCESSORIES

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LEFT HAND REDUCER-PLAN



RIGHT HAND REDUCER-PLAN

WIDTH	WW	600	600	450
	W	450	300	300

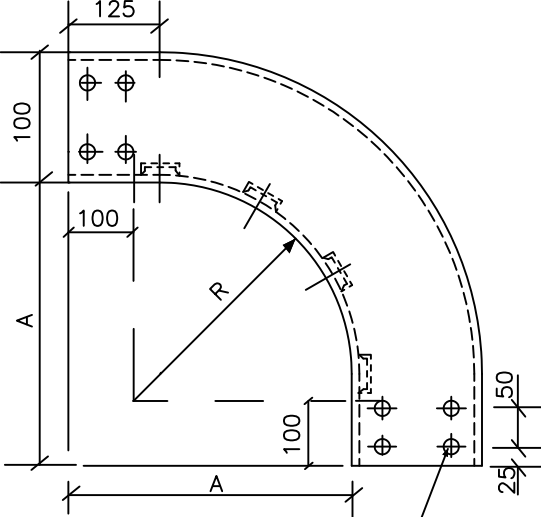
LADDER TYPE ACCESSORIES

FOR GENERAL NOTES REFER SHEET 11 OF 11

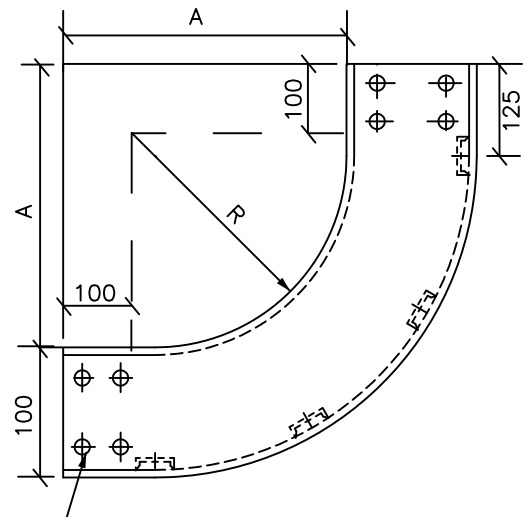


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**ELEVATION**  
**90° VERTICAL BEND**  
**(OUTSIDE)**

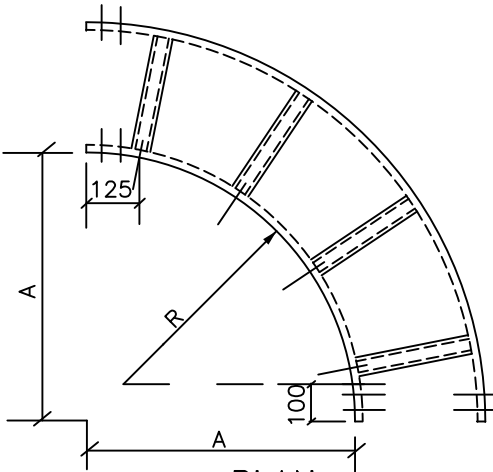


**ELEVATION**  
**90° VERTICAL BEND**  
**(INSIDE)**

4 NOS. 10 DIA. HOLES  
FOR JOINTING

**LADDER TYPE TRAYS**

WIDTH(W)	RADIUS (R)	A
600	600	700
450	600	700
300	600	700



**PLAN**  
**90° HORIZONTAL BEND**

**LADDER TYPE ACCESSORIES**

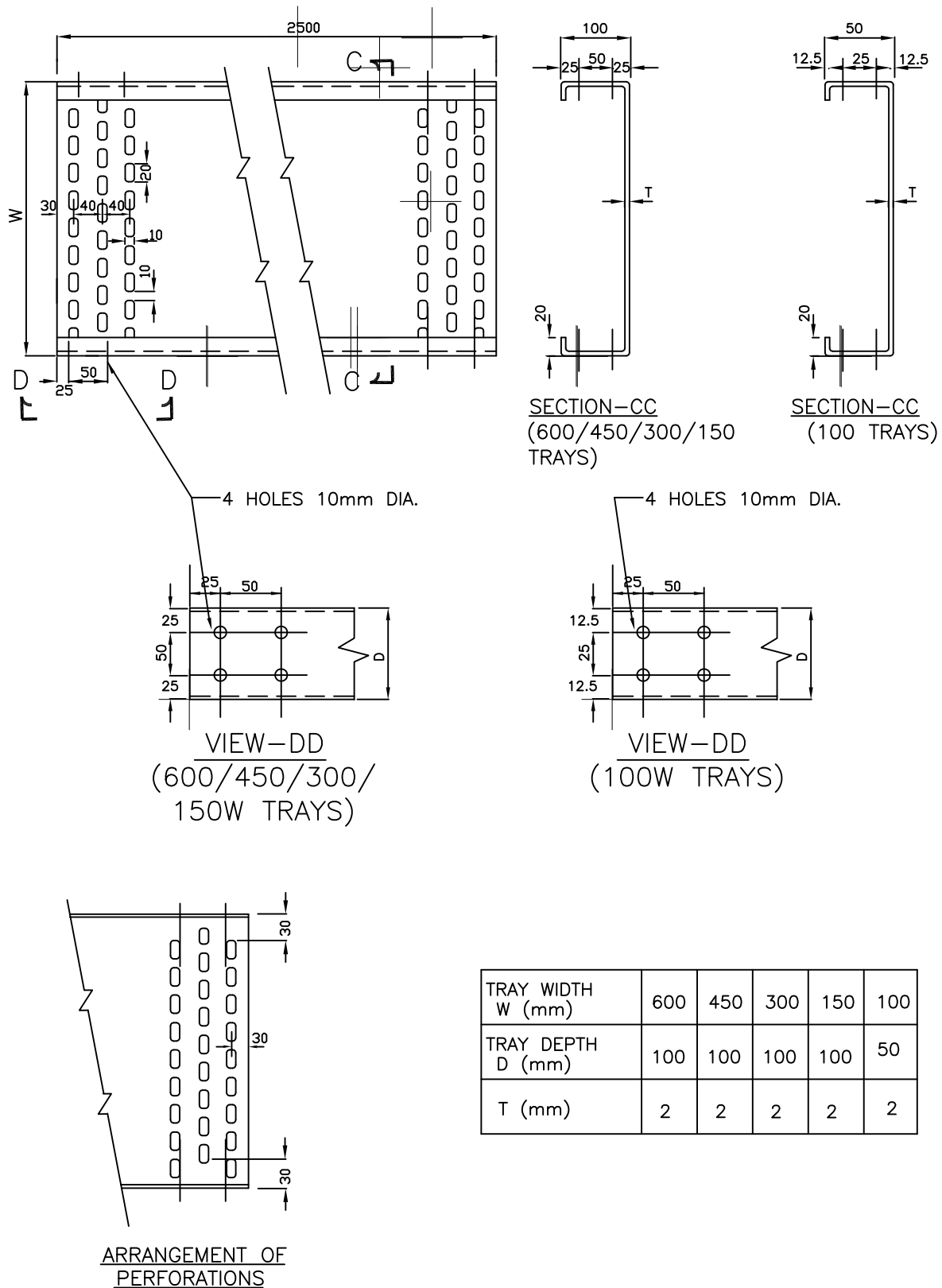
FOR GENERAL NOTES REFER SHEET 11 OF 11



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### PERFORATED TYPE TRAY

FOR GENERAL NOTES REFER SHEET 11 OF 11

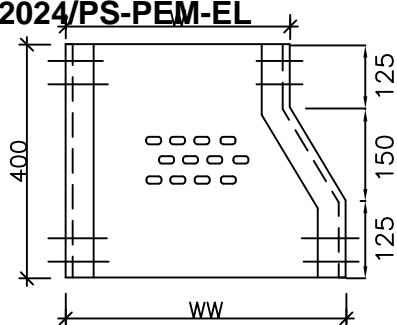


### TYPICAL DETAILS OF CABLE TRAYS AND ACCESSORIES

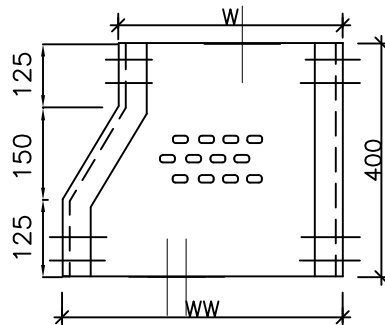
DWG. NO.  
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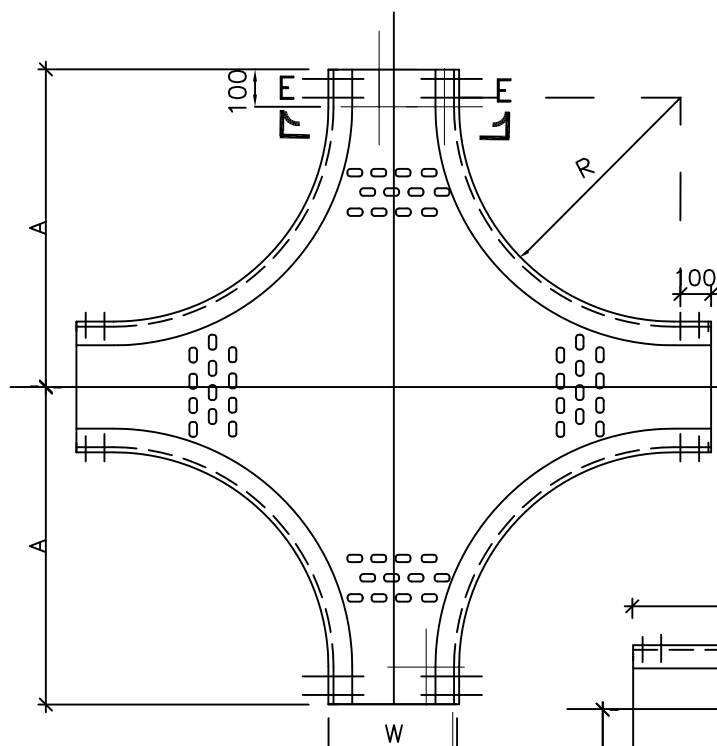
LEFT HAND REDUCER



RIGHT HAND REDUCER

WW	W	DEPTH	THICKNESS
600	450	100	2
600	300	100	2
450	300	100	2

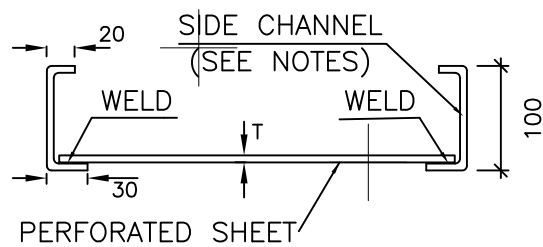
PERFORATED TYPE



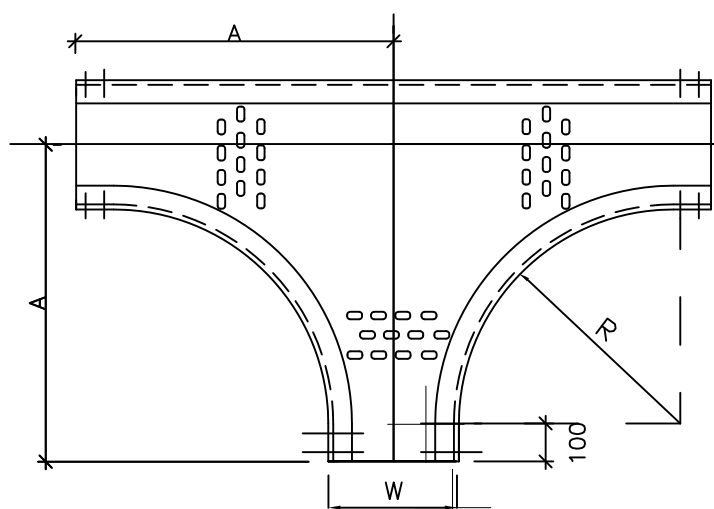
CROSS

PERFORATED TYPE

WIDTH(W)	RADIUS (R)	A	T
600	600	1000	2
450	600	925	2
300	600	850	2



SECTION-EE



TEE

PERFORATED TYPE ACCESSORIES

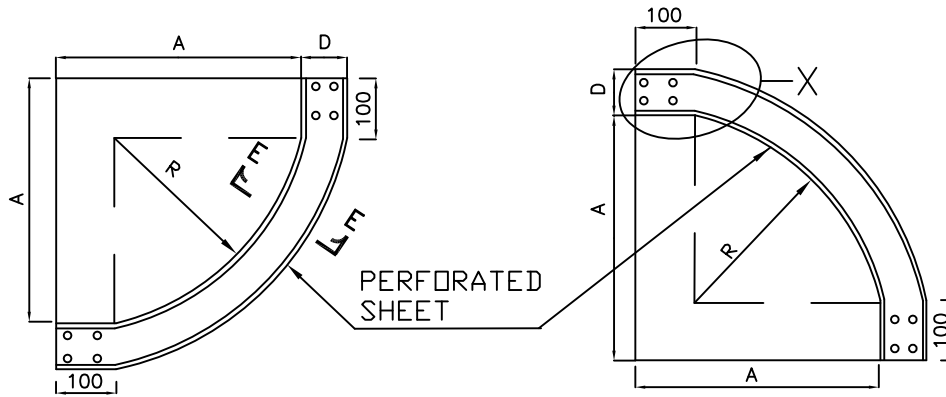
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TYPICAL DETAILS OF CABLE TRAYS AND ACCESSORIES

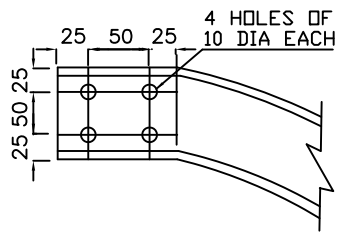
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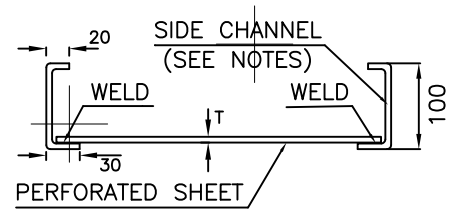


INSIDE TYPE

OUTSIDE TYPE

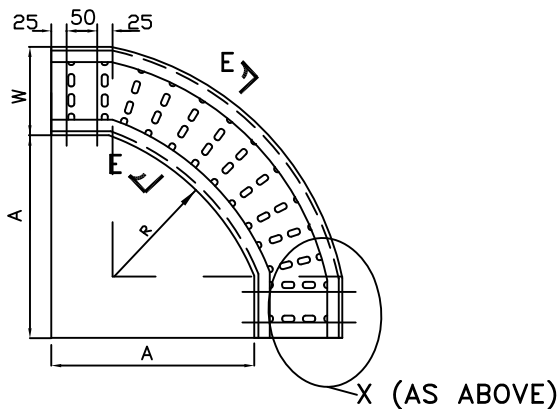


ENLARGED VIEW OF "X"



SECTION-EE

90° VERTICAL BEND - PERFORATED TYPE



90° HORIZONTAL BEND - PERFORATED TYPE

WIDTH(W)	RADIUS (R)	A	T
600	600	700	2
450	600	700	2
300	600	700	2

PERFORATED TYPE ACCESSORIES

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
TYPICAL DETAILS OF CABLE TRAYS AND  
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NOTES:—

1. THE LADDER AND PERFORATED TYPE CABLE TRAYS AND ACCESSORIES (INCLUDING SIDE RUNNERS OF LADDER TYPE TRAYS & ACCESSORIES) SHALL BE MADE OF 2MM HOT ROLLED M.S. SHEET. ALL THE COUPLER PLATE SHALL BE 3 MM THICK. THESE TRAYS SHALL BE USED IN ALL AREAS OF POWER HOUSE EXCEPT FOR AREAS LIKE INTAKE RAW WATER PUMP HOUSE, DESALINATION PLANT, CHP, BATTERY ROOM, NDCT, AND CHEMICAL HOUSE WHERE FRP CABLE TRAYS SHALL BE USED. 
2. THE CABLE TRAYS & ACCESSORIES SHALL BE HOT DIP GALVANISED AS PER IS 2629. THE MASS OF ZINC COATING SHALL NOT BE LESS THAN 610 gm/m<sub>2</sub> AND THICKNESS SHALL BE 86 MICRONS (MINIMUM).
3. FOR LADDER TYPE CABLE TRAYS AND ACCESSORIES, ALL RUNGS SHALL BE SLOTTED.
4. PERFORATED TRAYS SHALL BE FABRICATED OUT OF A SINGLE M.S. SHEET.
5. STANDARD TRAY ACCESSORIES SHALL BE WITH THE RADIUS INDICATED IN THIS DRAWING.
6. SIDE CHANNELS OF PERFORATED TYPE CABLE TRAY ACCESSORIES SHALL BE WELDED WITH THE PERFORATED SHEET AT INTERVALS OF 100mm.
7. LENGTH OF WELDING SHALL NOT BE LESS THAN 25mm FOR CABLE TRAYS. THE THICKNESS OF WELDING SHALL BE AS PER IS 9595.
8. ALL TRAY CORNERS SHALL BE SMOOTH AND FREE OF SHARP EDGES.
9. THE CABLE TRAY COVER SHALL BE OF 1.6MM THICK MS SHEET AND SHALL BE HOT DIP GALVANISED.
10. THE DEPTH, WIDTH AND LENGTH OF TRAYS & TRAY COVERS SHALL BE WITHIN A TOLERANCE OF (+/-) 2 mm. THE THICKNESS TOLERANCE IS OF (+/-) 0.2 mm AS PER IS 1852.
11. THE THICKNESS OF THE FINISHED GALVANISED PRODUCT SHALL NOT BE LESS THAN 2MM.
12. TO FACILITATE ASSEMBLY, ALL ACCESSORIES AT ENDS SHALL HAVE 100mm STRAIGHT PORTION.
13. ALL NUTS, BOLTS, WASHERS ETC., SHALL BE HOT DIP GALVANISED AS PER IS:1367 PART XIII FOR SIZES 12 MM & ABOVE, AND ELECTROPLATED/ZINC PASSIVATED FOR SIZES UPTO 12 MM.
14. ALL CUTTING & FORMING OPERATIONS SHALL BE COMPLETED PRIOR TO GALVANIZING.
15. FINISHED TRAYS SHALL BE FREE FROM BURRS AND SHARP EDGES.
16. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE.
17. WIDTH OF CABLE TRAYS PROPOSED TO BE USED FOR THE PROJECT ARE AS UNDER:
  - A) LADDER TYPE: 600W, 450W, 300W, 150W.
  - B) PERFORATED TYPE: 600W, 450W, 300W, 150W, 100W.
18. THE DEPTH OF 600W, 450W, 300W, 150W TRAYS & ACCESSORIES SHALL BE 100MM. THE DEPTH OF 100W TRAYS & ACCESSORIES SHALL BE 50MM.
19. 600MM WIDE TYPE CABLE TRAYS SHALL BE SUITABLE FOR A CABLE WEIGHT OF 100 Kg PER METRE (INCLUDING LIVE LOAD) OF RUNNING LENGTH OF TRAY.
20. PEM SHALL BE MARKED ON SIDE RUNNER OF EACH TRAY SECTION.



### TYPICAL DETAILS OF CABLE TRAYS AND ACCESSORIES

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## QUALITY PLAN

12/28/2024/PS-PEM-EL

MANUFACTURER/ BIDDER/  
SUPPLIER NAME & ADDRESS

## STANDARD QUALITY PLAN

SPEC. NO.:

DATE:

CUSTOMER: -NA-

QP NO.: PE-QP-999-507-E005, REV. 04

DATE: 04.01.2024

PROJECT: -NA-

PO NO.:

DATE:

ITEM: CABLE TRAYS &  
ACCESSORIES

SYSTEM: CABLING

SHEET 1 of 3

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	*	**			
					M	B				D	M	B	C	
<b>1.0 RAW MATERIAL</b>														
1.1	HOT ROLLED CARBON STEEL SHEET	1 CHEM & PHY PROPERTIES	MA	VERIFICATION OF TCS	100%	100%	IS -1079	IS -1079	TC	√	P/V	V	-	
		2 DIMENSIONS	MA	MEASUREMENT	100%	-	IS-1730	IS-1730	QC RECORD		P	-	-	
		3 SURFACE FINISH	MA	VISUAL	100%	-	IS-1079	IS-1079	QC RECORD		P	-	-	
1.2	ZINC	CHEM COMP	MA	CHEM TEST	EACH HEAT	EACH HEAT	IS-209	IS-209	TC	√	P/V	V	-	
<b>2.0 IN-PROCESS</b>														
2.1	FABRICATION	1 DIMENSIONS	MA	MEASUREMENT	100%	100%	APPD DOCUMENT ASME SEC. IX	APPD DOCUMENT ASME SEC. IX	QC RECORD	√	P	V		
		2 WELDING QUALITY	MA	VISUAL	100%	100%			QC RECORD	√	P	V		Welding is to be done by qualified welders in accordance with ASME SEC. IX article III WPS, PQR & WPI to be reviewed during inspection.
		3 SURFACE FINISH	MA	VISUAL	100%	100%	FREE FROM DEFECTS & SLAG	FREE FROM DEFECTS & SLAG	QC RECORD	√	P	V	-	
2.2	SURFACE PREPARATION	1 CLEANING, PICKLING & RINSING & FLUXING	MA	VISUAL	100%	-	IS 2629	IS 2629	QC RECORD		P/V	-	-	
		2 SURFACE FINISH	MA	VISUAL	100%	-	IS 2629	IS 2629	QC RECORD		P/V	-	-	

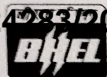
BIDDER/SUPPLIER	
Sign & Date	
Seal	

BHEL					
ENGINEERING			QUALITY		
Sign & Date	Name		Sign & Date	Name	
Checked by: <i>Mantoo</i>	MANJUS MEENA	Checked by: <i>Hinto</i>	Minto		
Reviewed by: <i>HUE</i>	HEENA	Reviewed by: <i>HUE</i>			
	Reviewed by: <i>KUTHIA</i>				

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
Sign & Date	Name	Seal	
Reviewed by:			
Approved by:			



12/09/2024/PS-PEM-EL

MANUFACTURER/ BIDDER/  
SUPPLIER NAME & ADDRESS

## STANDARD QUALITY PLAN

SPEC. NO :

DATE:

CUSTOMER : -NA-

QP NO.: PE-QP-999-507-E005, REV. 04

DATE: 04.01.2024

PROJECT: -NA-

PO NO.:

DATE:

ITEM: CABLE TRAYS &  
ACCESSORIES

SYSTEM: CABLING

SHEET 2 of 3

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	D	**			
					M	B					M	B	C	
2.3	GALVANISING	1.TEMPERATURE OF ZINC BATH	MA	MEASUREMENT	CONTINUOUS	-	IS-2629	IS-2629	QC RECORD		P/V	-	-	Galvanization is to be done at galvanization plant listed in Annexure-1 to quality plan.
		2.DROSS	MA	VISUAL	PERIODIC	-	IS-2629	IS-2629	QC RECORD		P/V	-	-	
		3.RATE OF IMMERSION	MA	VISUAL	100%	-	IS 2629	IS 2629	QC RECORD		P/V	-	-	
		4. SURFACE FINISH	MA	VISUAL	100%	-	IS 2629	FREE FROM BURRS, ROUGHNESS, SLAG FLUX, STAIN ETC.	QC RECORD		P/V	-	-	

## 3.0 FINISHED ITEMS

3.1	(CABLE TRAY, ACCESSORIES &)	1. DIMENSIONS	MA	MEASUREMENT	IS-2500 (PART 1) LEVEL S-4	IS-2500 (PART 1) LEVEL S-4	APPD.DRG	APPD. DOCUMENT	INSP REPORT	✓	P	W	-	
		2. SURFACE FINISH	MA	VISUAL	IS-2500 (PART 1) LEVEL S-4	IS-2500 (PART 1) LEVEL S-4	APPD. DRG	FREE FROM BURRS, SLAG, ROUGHNESS, FLUX, STAIN ETC.	INSP REPORT	✓	P	W	-	
		3.RIGIDITY (FOR TRAYS)	MA	DEFLECTION TEST	05 No./ LOT/	05 No./ LOT/	APPD. DRG	APPD. DOCUMENT	INSP REPORT	✓	P	W	-	600MM wide Ladder & perforated cable tray to be tested. Maximum deflection shall not exceed 7MM on mid span on uniform loading of 100KG/M.

## BIDDER/SUPPLIER

Sign & Date	
Seal	


## BHEL

ENGINEERING				QUALITY			
Sign & Date	Name	Sign & Date	Name	Sign & Date	Name	Sign & Date	Name
Checked by: <i>Mund</i>	MANOJ MEENA	Checked by: <i>Harish</i>	MURDOO	Reviewed by: <i>Harish</i>	MURDOO	Reviewed by: <i>Harish</i>	MURDOO
Reviewed by: <i>Harish</i>	MEENA RUSHWA	Reviewed by: <i>Harish</i>	MURDOO	Reviewed by: <i>Harish</i>	MURDOO	Reviewed by: <i>Harish</i>	MURDOO

## FOR CUSTOMER REVIEW &amp; APPROVAL

Doc No:		Sign & Date	Name	Seal
Reviewed by:				
Approved by:				

12/28/2024/PS-PEM-EL

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS		STANDARD QUALITY PLAN				SPEC. NO.:		DATE:	
	CUSTOMER: -NA-				QP NO.: PE-QP-999-507-E005, REV. 04				DATE: 04.01.2024	
	PROJECT: -NA-				PO NO.:				DATE:	
	ITEM: CABLE TRAYS & ACCESSORIES		SYSTEM: CABLING		SHEET 3 of 3					

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY				REMARKS
1	2	3	4	5	6		7	8	9	* D	**				
					M	B					M	B	C		
<b>3.0 FINISHED ITEMS</b>															
		4 MASS OF ZINC COATING	MA	CHEM. TEST	IS-4759	IS-4759	IS-6745	APPD DOCUMENT	INSP REPORT	✓	P	W	-		
		5 UNIFORMITY OF ZINC COATING	MA	CHEM. TEST	IS-4759	IS-4759	IS-2633	IS-2633	INSP REPORT	✓	P	W	-		
		6 THICKNESS OF ZINC COATING	MA	PHYSICAL TEST	IS-4759	IS-4759	APPD DOCUMENT	APPD DOCUMENT	INSP REPORT	✓	P	W	-		
		7 ADHESION	MA	MECH. TEST	IS-4759	IS-4759	IS-2629	IS-2629	INSP REPORT	✓	P	W	-		
		8 COUPLER PLATE	MA	VISUAL	100%	100%	APPD DOCUMENT	APPD DOCUMENT	INSP REPORT	✓	P	W	-		
		9 NUT & BOLT	MA	VISUAL	100%	100%	APPD DOCUMENT	APPD DOCUMENT	INSP REPORT	✓	P	W	-		Inspector to mention the total number of bags/bundles of coupler plates, nuts, bolts & washer in the inspection report.
		10 WASHER	MA	VISUAL	100%	100%	APPD DOCUMENT	APPD DOCUMENT	INSP REPORT	✓	P	W	-		further manufacturer shall attach the detail of total number of bags/bundles of the respective items with packing list.
		11 PACKING	MA	VISUAL	100%	100%	APPD DOCUMENT	APPD DOCUMENT	INSP REPORT	✓	P	W	-		

**NOTES:**

1. LATEST REVISION/ YEAR OF ISSUE OF ALL THE STANDARDS (IS/ASME/IEC ETC.) INDICATED IN QP SHALL BE REFERRED

**LEGENDS:**

\*RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. D: DOCUMENTATION

\*\* M: SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, B: BHEL/ THIRD PARTY INSPECTION AGENCY, C: CUSTOMER,

P: PERFORM, W: WITNESS, V: VERIFICATION, AS APPROPRIATE. MA: MAJOR, MI: MINOR, CR: CRITICAL.

BIDDER/SUPPLIER	
Sign & Date	
Seal	

BHEL					
ENGINEERING			QUALITY		
Checked by:	Sign & Date	Name	Checked by:	Sign & Date	Name
Reviewed by:			Reviewed by:		

FOR CUSTOMER REVIEW & APPROVAL				
Doc No:	Sign & Date	Name	Seal	
Reviewed by:				
Approved by:				


## SUB VENDOR LIST

SL NO.	ITEM/SERVICE DESCRIPTION	VENDOR NAME	ADDRESS	PHONE	REMARKS
1	GALVANISING	Jenco Industrial Corporation	Chincholi Bunder Khkar Road Near Link Road Devruwadi Malad (W) Mumbai 400064		
2	GALVANISING	National Galvanizing Company	66, Barrackpore Kamarhatt Trunck Road Calcutta-700058		
3	GALVANISING	Sigma Galvanising Pvt. Ltd.	Plot No.C-169, TTC, MIDC Ind Area Navin Mumbai-400705	8725402,8725765	
4	GALVANISING	B.P. Projects PVT LTD	167A, Vivekananda Road Kolkata-700006	033 2553 1254	
5	GALVANISING	Standard Galvanisers	Makardah Road, Kabar Para, Bankra, Howarah -711403	28756318/28741986/28725402 /28725765	
6	GALVANISING	Steel Products	National Highway No. 6, Chamrail, Kona, Howrah-711114		
7	GALVANISING	Unitech Fabricators & Engineers Pvt. Ltd.	Village- Ajab Nagar, P.O. -Molla Simla, P.S. - Singur, Dist - Hoogly, Pin-712223	022 -27686606/ 1907	
8	GALVANISING	Shivam Engineers & Fabricators	A0-282-284, Industrial Area, South Side of G.T. Road, Ghaziabad, U.P.		
9	GALVANISING	B.G. Shirke Construction Technology Pvt. Ltd	72-76, Mundhawa, Pune - 401 036		
10	GALVANISING	Galbro Ispat Galvanizers Pvt. Ltd.	GUT 11 AND 12, OPP. Kudus Steel,Rolling Mill, Wada, Thane , Mumbai		
11	GALVANISING	Eros Infrastructures Pvt. Ltd.	G-97, MIDC, Bhutibori , Nagpur-441108, Maharashtra		
12	GALVANISING	Industrial Perforation (India) Pvt. Ltd.	Ganganagr, Katakhal, Kolkata-700132		
13	GALVANISING	Indmark Formtech Pvt. Ltd.	Phase - 3, E - 11 / 1, M. I. D. C., Chakan, Pune - 410 501, Maharashtra, India.		
14	GALVANISING	Namdhari Industrial Traders Pvt. Ltd.	Village Latton Dana, Chandigarh Road, Ludhiana		
15	GALVANISING	Neha Galvaniser	Jalan Industrial Estate, Gate No-1, 1st Right Choise Lane, Near N.G-6, Jangalpur, PO Domjur Howrah - 700071, West Bengal, India		
16	GALVANISING	Patny Systems (P) Ltd.	Unit-IV, Sy No. -228/9, Plot No. 6, IP Kuchavaram, Toopran(M) Dist.- Medak, Telegana - 502336		
17	GALVANISING	Parmar Metal Company	Survey No.207,Veraval (Shapar) Dist. Rajkot, India.		
18	GALVANISING	Rukmani Electrical & Components Pvt Ltd	Urla Industrial Area, Urla Sarora Road, Raipur- 493 221 (Chhattisgarh)		
	GALVANISING	Rukmani Fab & Gal Pvt Ltd	Shankharidaha Baniyarah, Jalan Industrial Complex, Gate no.3, Lane no. 4, Domjur, Howrah , W.B. - 711411		
19	GALVANISING	DMP Projects Pvt.Ltd.	Dulagarh Industrial Park , PS-Sankrail , Howrah -711302		
20	GALVANISING	Vinfab Engineers India Private Limited	Gut no. 224/1 &2 Bhiwandi Wada State Highway, Village khupri, Dist. Thane, Maharashtra -421303		
21	GALVANISING	Saral Projects & Processors	B-1, Industrial Area, Site-II, Amawan Road Rae Bareli		


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22	GALVANISING	Brahmpuri Steels Limited	172 (F) Industrial Area, Jhotwara, Jaipur-302013		
23	GALVANISING	Indiana Gratings PVT. LTD	F-5, MIDC Jejuri, Pune-412 303		
24	GALVANISING	M/s AVAIDS TECHNOVATORS PVT. LTD.	131, MATSYA INDUSTRIAL AREA, ALWAR RAJASTHAN		
25	GALVANISING	M/s Ratan Projects & Engineering Co. Pvt. Ltd.	VILL Muslim Para, PO- Barunda, P.S – Bagnan, Howrah – 711 303		




	<b>TECHNICAL SPECIFICATION CABLE TRAYS &amp; ACCESSORIES 2X660MW ENNORE SEZ STPP</b>	PE-TS-412-507-E021A
		Issue No: 01
		Rev. No. 00
		Date : 28/02/2024

## PACKING REQUIREMENT

Sl.no	DESCRIPTION
1	<b>Type of Packing:</b>
1.1	The material shall be packed to ensure protection against damage during transit, storage for prolonged periods and handling.
1.2	Similar type and size of cable trays and accessories shall be grouped together and
1.3	At bottom of each stack wooden block shall be provided. Trays and accessories in each stack shall be tied with with steel wires / strips for convenient handling. At top of stack rubber or any material to be provided below wire/strip to avoid damage in galvanization.
1.4	Coupler plates- 50 nos cupler plates shall be tied together with wire rope and number os such sets shall be placed in wooden box. Each wooden
1.5	Nuts, bolts & washer shall be packed in wooden box.
1.6	The following details shall be marked on the packing/each stack (1.3, 1.4, 1.5 above): i) Name and address of the consignee ii) Purchase Order No: iii) Name of supplier iv) Description of material v) Quantity of items (in numbers and weight) vi) Gross weight
2	<b>Quality of wood:</b>
2.1	<b>Quality of wood:</b> Wood used for packing box shall be Pinewood, Rubber wood, Mango wood, Fir wood, Silver Oak wood or other as per availability with moisture content not exceeding 30%.
3	<b>Cushioning material and moisture absorber:</b>
3.1	Suitable cushioning shall be provided by rubberized coir/ thermocol / expanded soft polyethylene foam.
3.2	Adequate quantity of packed desiccant shall be suitably placed inside the packing box.
4	<b>Packing slip &amp; holder:</b>
4.1	Packing slip kept in polyethylene bag shall be placed inside the wooden box at appropriate place.
4.2	One copy of packing slip wrapped in polyethylene bag covered in galvanized iron tin sheet/ aluminium packing slip holder shall be fixed on the external surface the packing box.
	
TYPICAL PACKING DETAILS	




	<b>TECHNICAL SPECIFICATION</b> <b>CABLE TRAYS &amp; ACCESSORIES</b> <b>2X660MW ENNORE SEZ STPP</b>	PE-TS-412-507-E021A
		Issue No. 01
		Rev. No. 00
		Date : 28/02/2024

### DOCUMENTATION REQUIREMENT

DRAWINGS & DOCUMENTS TO BE SUBMITTED BY ALL THE BIDDERS ALONG WITH THE BID	
Sl. No.	DOCUMENT TITLE
1	PQR CREDENTIALS
2	COMPLIANCE CERTIFICATE

DRAWINGS & DOCUMENTS TO BE SUBMITTED BY SUCCESSFUL BIDDER AFTER AWARD OF CONTRACT ALONG WITH SUBMISSION SCHEDULE							
Sl. No.	DOCUMENT TITLE	DOCUMENT NUMBER	Primary/Secondary	Vendor submission (Days)*	BHEL Comment (Days)	Vendor submission (Days)#	BHEL & Customer comment/ approval (Days)
1	Technical Datasheet for Cable Trays & Accessories	PE-V1-412-507-E011	Primary	5	5	5	5
2	GA Drawing for Cable Trays & Accessories	PE-V1-412-507-E012	Primary	5	5	5	5
3	Quality Plan for Cable Trays & Accessories	PE-V1-412-507-E904	Primary	5	5	5	5
4	Packing details along with procedure	PE-V1-412-507-E021	Secondary	5	5	5	5
NOTES:							
a) * 1st submission within indicated days from date of purchase order.							
b) # Submission (within indicated days) after incorporating all BHEL comments.							
c) Primary documents shall be considered for Delay analysis							

DRAWINGS & DOCUMENTS TO BE SUBMITTED AS FINAL/AS-BUILT DOCUMENT	
Sl. No.	DOCUMENT TITLE
	NIL

	<b>TECHNICAL SPECIFICATION CABLE TRAYS &amp; ACCESSORIES 2X660MW ENNORE SEZ STPP</b>	PE-TS-412-507-E021A
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		Date : 28/02/2024

<b>COMPLIANCE CERTIFICATE</b>	
The bidder shall confirm compliance to the following by signing/stamping this compliance certificate and furnishing same with the offer	
1	It is hereby confirm that the technical specification (sheet 1 to 30 ) has been read, understood. We confirm compliance to the tender specification including any clarification and amendments without any deviation.
2	It is hereby declared that any technical submittals which was not specifically asked for in NIT shall stand withdrawn.

Signature of authorised Representative

Name and Designation :

Name & Address of the Bidder

Date



TECHNICAL SPECIFICATION  
CABLE TRAYS & ACCESSORIES  
2X660MW ENNORE SEZ STPP

PE-TS-412-507-E021A

Issue No: 01

Rev. No. 00

Date : 28/02/2024

## UNPRICED SCHEDULE

Item No.	Item Description	UOM	Quantity	Unit Price (Rs.)	Total Price (Rs.)
1	CABLE TRAY- LADDER TYPE 150W	MTR.	9,500.00		
2	CABLE TRAY- LADDER TYPE 300W	MTR.	4,600.00		
3	CABLE TRAY- LADDER TYPE 450W	MTR.	2,100.00		
4	CABLE TRAY- LADDER TYPE 600W	MTR.	3,300.00		
5	CABLE TRAY PERFORATED TYPE 150W	MTR.	4,000.00		
6	CABLE TRAY PERFORATED TYPE 300W	MTR.	1,900.00		
7	CABLE TRAY PERFORATED TYPE 450W	MTR.	2,500.00		
8	LAD CROSS 600 RAD 600W	NOS.	175.00		
9	LAD TEES 600MM RADIUS 300W	NOS.	21.00		
10	LAD TEES 600MM RADIUS 600W	NOS.	280.00		
11	LAD VER 90DEG BEND 600 RAD-INSIDE 450W	NOS.	7.00		
12	LAD VER 90DEG BEND 600 RAD-INSIDE 600W	NOS.	35.00		
13	LAD VER 90DEG BEND 600 RAD-OUTSIDE 600W	NOS.	140.00		
14	PER CROSS 600 RAD 600W	NOS.	140.00		
15	PER HOR 90DEG BEND 600 RAD. 150W	NOS.	35.00		
16	PER HOR 90DEG BEND 600 RAD. 450W	NOS.	21.00		
17	PER TEES 600 RADIUS 300W	NOS.	70.00		
18	PER VER 90DEG BEND 600 RAD-INSIDE 600W	NOS.	88.00		
19	CABLE TRAY 2MM THK- PERFORATED TYPE 50W	MTR.	300.00		

**1 Prices shall be variable as per following PVC formulae: -**

$$P = Po/100 (20 + 58 (SBIR/SBIRo) + 7 (Zn/Zno) + 15 (W/ Wo) )$$

Indices to be taken from IEEMA Circular (IEEMA(PVC)/TLA&H(R-3)/\_/\_ ) for the applicable month.

**Wherein,**

P = Price payable as adjusted in accordance with the above formula.

Po = Price quoted/confirmed.

SBIRo = Price of Steel Billets- Retail (refer notes)

**This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.**

Zno = Price of Electrolytic high-grade zinc (refer notes)

**This price is as applicable on the 1st working day of the month, one month prior to the date of tendering.**

W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100) (refer notes)

**This price is as applicable on the 1st working day of the month, three months prior to the date of tendering.**

SBIR = Price of Steel Billets- Retail (refer notes)

**This price is as applicable on the 1st working day of the month, two months prior to the date of delivery.**

Zn = Price of Electrolytic high-grade zinc (refer notes)

**This price is as applicable on the 1st working day of the month, two months prior to the date of delivery.**


W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2016 = 100) (refer notes)

**This price is as applicable on the 1st working day of the month, four months prior to the date of delivery.**


The date of delivery is the date on which the materials are notified as being ready for inspection/dispatch (in the absence of such notification, the date of manufacturer's dispatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

**Notes:**

- All prices of raw materials are exclusive of modvatable excise/CV duty amount and exclusive of any other central, state or local taxes; octroi etc.
- All prices are as on first working day of the month.
- PVC ceiling limit shall be positive (+ve) 20% and negative (-ve) unlimited.

	<b>TECHNICAL SPECIFICATION</b> <b>CABLE TRAYS &amp; ACCESSORIES</b> <b>2X660MW ENNORE SEZ STPP</b>	PE-TS-412-507-E021A
		Issue No. 01
		Rev. No. 00
		Date : 28/02/2024

## PRE QUALIFICATION REQUIREMENT (TECHNICAL)

	2X660MW ENNORE SEZ	PE-PQ-412-507-E001
	PRE-QUALIFICATION REQUIREMENTS FOR CABLE TRAYS & ACCESSORIES	REVISION NO. 00    DATE 28/02/2024
		Page 1 of 2


<b>ITEMS: Cable trays &amp; Accessories</b>	
<b>SCOPE: Supply: YES; Erection &amp; Commissioning: NO;</b>	
1	Vendor should have in-house fabrication & manufacturing facility.
2	Capability of manufacturing cable trays & accessories for 30 km per month.
3	Vendor has his own galvanization plant.  OR  Vendor should get galvanization of cable trays & accessories to be done from any of the BHEL-PEM approved galvanizers.
4	Manufactured & supplied at least 100 km of cable trays & accessories in one or more orders and at least 30 km in a single order.
5	Minimum two (2) nos. purchase orders for cable trays & accessories shall be submitted which should not be more than five (5) years old from date of techno-commercial bid opening for establishing continuity in business.

#### Notes (General points of PQR):

1. Offers of the JV companies/ Joint Bidders/ bidders having collaboration/ licensing agreement/ MOU/ Indian subsidiaries shall be evaluated as follows:
  - a. If bidder happens to be an Indian subsidiaries of foreign OEM, then the credentials of the foreign OEM can also be considered for meeting PQR.
  - b. If bidder happens to be the Joint Venture Company, then the credentials of any of JV partners can be also considered for meeting PQR.
  - c. If bidder happens to bid jointly with their partner, then credentials of both the partners will be considered for meeting PQR as per distribution of the work. In all such cases, lead bidder as specified in bid documents shall be responsible for overall execution of the contract and all guarantee/ warranty.
  - d. If bidder happens to be the having valid collaboration agreement/ MOU/ licensing agreement with some other company, then the credentials of collaborator/ MOU partner/ licensing company can also be considered for meeting PQR.

Note: If bidder(s) qualifies on the basis of credentials of his principal/ JV partner/ Collaborator/ joint bidder etc., then the principal/ JV partner/ Collaborator/ MOU partner/ joint bidder shall be responsible for overall design vetting and warranty/ guarantee of the package. The scope matrix clearly defining their respective roles including design vetting, manufacturing of critical component, E&C etc. etc. and warranty/ guarantee shall be submitted along with the offer.

PREPARED BY	CHECKED BY	REVIEWED BY	APPROVED BY
RAKESH KUMAR GAUTAM (ENGINEER)	MEGHA (MANAGER)/ AYAN SAHA (DGM)	SANDEEP LODH, (AGM)	DEBASISA RATH, GM ( ELECT.)

	2X660MW ENNORE SEZ	PE-PQ-412-507-E001
	PRE-QUALIFICATION REQUIREMENTS FOR CABLE TRAYS & ACCESSORIES	REVISION NO. 00      DATE 28/02/2024
		Page 2 of 2

2. Bidder to note that the arrangement of bidding (joint bid partners/ collaborator/ MOU partner/ licensing company etc.) once offered to BHEL as a part of bidding documents cannot be changed till the execution of the project.
3. Consideration of offer shall be subject to customer's approval of bidders, if applicable
4. Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self- attested English translated document should also be submitted.
5. Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
6. After satisfactory fulfilment of the above criteria/ requirement, offer shall be considered for further evaluation as per NIT and all the other terms of tender.

PREPARED BY	CHECKED BY	REVIEWED BY	APPROVED BY
RAKESH KUMAR GAUTAM (ENGINEER)	MEGHA (MANAGER)/ AYAN SAHA (DGM)	SANDEEP LODH, (AGM)	DEBASISA RATH, GM ( ELECT.)