		R&M of STEAM TURBINES OF UKAI TPS UNIT-3 (1X200MW) & UNIT-5 (1X210MW)		
BOQ CUM PRICED SCHEDULE				
CABLE TRAY & ACCESSORIES				
Sr. No.	ITEM CODE	ITEM DESCRIPTION	UNIT	Final QTY
1.0		HOT DIP GALVANISED LADDER TYPE CABLE TRAY COMPLETE WITH COUPLER PLATES, FASTENERS, CLAMPS		
a)	507-21102-A	CABLE TRAY 2MM THICK- LADDER TYPE 300W	MTR	1000
b)	507-21104-A	CABLE TRAY 2MM THICK- LADDER TYPE 600W	MTR	700
2.0		HOT DIP GALVANISED PERFORATED TYPE CABLE TRAY COMPLETE WITH COUPLER PLATES, FASTENERS, CLAMPS		
a)	507-21109-A	CABLE TRAY 2MM THICK PERFORATED TYPE 150W	MTR	600
b)	507-21110-A	CABLE TRAY 2MM THICKPERFORATED TYPE 300W	MTR	1000
c)	507-21112-A	CABLE TRAY 2MM THICKPERFORATED TYPE 600W	MTR	700
3.0		HOT DIP GALVANISED CABLE TRAY ACCESSORIES		
3.1		LADDER TYPE HORIZONTAL 90 DEG. BEND-600mm RADIUS		
a)	507-21117-A	LAD HOR 90DEG BEND 2MM THICK 600 RAD 300W	NOS	10
b)	507-21119-A	LAD HOR 90DEG BEND 2MM THICK 600 RAD 600W	NOS	10
3.2		LADDER TYPE TEES-600mm RADIUS		
a)	507-21135-A	LAD TEES 2MM THICK 600MM RADIUS 300W	NOS	20
b)	507-21137-A	LAD TEES 2MM THICK 600MM RADIUS 600W	NOS	5
3.3		PERFORATED TYPE HORIZONTAL 90 DEG. BEND-600mm RADIUS		
a)	507-21153-A	PER HOR 90DEG BEND 2MM THICK 600 RAD. 300W	NOS	10
b)	507-21155-A	PER HOR 90DEG BEND 2MM THICK 600 RAD. 600W	NOS	10
3.4		PERFORATED TYPE TEES-600mm RADIUS		
a)	507-21171-A	PER TEES 2MM THICK 600 RADIUS 300W	NOS	20
b)	507-21173-A	PER TEES 2MM THICK 600 RADIUS 600W	NOS	5
3.5		PERFORATED TYPE REDUCERS		
a)	507-21184-A	PER REDUCER (50% LHS/RHS) 2.5MM THICK 600-300W	NOS	10
3.6				
a)	507-21939-A	Coupler Plate	NOS	6800
b)	507-21940-A	NUT	NOS	28500
c)	507-21941-A	BOLT	NOS	28500
d)	507-21942-A	WASHER	NOS	57000

Note: 1 Total Quantity indicated above shall be known as ordered quantity. The Total quantity variation shall be as per NIT.

2 Price of items at Sl. no. 3.6 shall be included in price of cable trays. No separate charges shall be applicable. These items are to be properly counted and the same shall be dispatched in properly packed wooden box.

	1X200 + 1X210MW GSECL UKAI TG R&M, UNIT # 3 & 5	PE-PQ-499-507-E001
	PRE-QUALIFICATION REQUIREMENTS FOR CABLE TRAYS & ACCESSORIES	REVISION NO. 00 DATE 01/09/2023 Page 1 of 2


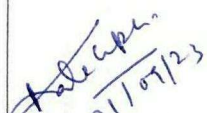
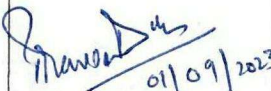
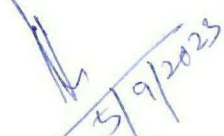
ITEMS: Cable trays & Accessories	
SCOPE: Supply: YES; Erection & Commissioning: NO;	
1	Vendor should have in-house fabrication & manufacturing facility.
2	Capability of manufacturing cable trays & accessories for 1 km per month.
3	Vendor has his own galvanization plant. OR Vendor should get galvanization of cable trays & accessories to be done from any of the BHEL-PEM approved galvanizers.
4	Manufactured & supplied at least 2 km of cable trays & accessories in one or more orders.
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.





2. Bidder to note that the arrangement of bidding (joint bid partners/ collaborator/ MOU partner/ licensing

PREPARED BY	CHECKED BY	REVIEWED BY	APPROVED BY
 ANJALI, DY. MANAGER	 KAVITA GUPTA / HEMA KUSHWAHA, SR. MANAGER / DY. GM	 PRAVEEN DUTTA, AGM	 DEBASISA RATH, AGM (DH)

	1X200 + 1X210MW GSECL UKAI TG R&M, UNIT # 3 & 5	PE-PQ-499-507-E001
	PRE-QUALIFICATION REQUIREMENTS FOR CABLE TRAYS & ACCESSORIES	REVISION NO. 00 DATE 01/09/2023 Page 2 of 2

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
 ANJALI, DY. MANAGER	 KAVITA GUPTA / HEMA KUSHWAHA, SR. MANAGER / DY. GM	 PRAVEEN DUTTA, AGM	 DEBASISA RATH, AGM (DH)

	TECHNICAL SPECIFICATION & DATA SHEET FOR CABLE TRAYS & ACCESSORIES	Specification No.: PE-TS-499-507-E021
		Rev. No. 00
		Date : 06.09.2023

R&M of STEAM TURBINES OF UKAI TPS UNIT-3 (1X200MW) & UNIT-5 (1X210MW)

TECHNICAL SPECIFICATION
FOR
CABLE TRAYS & ACCESSORIES

SPECIFICATION No. PE-TS-499-507-E021



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

	TECHNICAL SPECIFICATION & DATA SHEET FOR CABLE TRAYS & ACCESSORIES	Specification No.: PE-TS-499-507-E021
		Rev. No. 00
		Date : 06.09.2023


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1	SCOPE	
2	TECHNICAL SPECIFICATION & DATA SHEET	
3	DOCUMENTATION REQUIREMENT	
4	GENERAL NOTES	
5	DRAWINGS	
6	QUALITY PLAN	
7	LIST OF APPROVED GALVANISERS	

	TECHNICAL SPECIFICATION & DATA SHEET FOR CABLE TRAYS & ACCESSORIES	Specification No.: PE-TS-499-507-E021
		Rev. No. 00
		Date : 06.09.2023

SCOPE

SCOPE OF THIS PACKAGE COVERS THE FOLLOWING:		
1	SUPPLY INCLUDING DESIGN, ENGINEERING & MANUFACTURING	YES
2	INSPECTION & TESTING AT MANUFACTURER WORKS (CALIBRATION/CV TEST)	YES
3	E&C	NO
4	SUPERVISION OF ERECTION & COMMISSIONING	NO
5	MANDATORY SPARE	NO
6	O & M SPARE	NO
7	COMMISSIONING SPARE	NO
8	PACKING	YES
9	PAINTING	NO
10	TRANSPORTATION & DELIVERY TO SITE	YES

	TECHNICAL SPECIFICATION & DATA SHEET FOR CABLE TRAYS & ACCESSORIES	Specification No.: PE-TS-499-507-E021
		Rev. No. 00
		Date : 06.09.2023

A. GENERAL INFORMATION

1	PROJECT	R&M of Steam Turbines of Ukai TPS Unit-3 (1X200MW) & Unit-5 (1X210MW)
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B. DESIGN CODES & STANDARDS

1	DESIGN STANDARD	a) IS: 1079 For hot rolled carbon steel sheet and strip. b) IS: 1730 For dimensions for steel sheet and strip. c) IS: 1363 Hexagon head bolts, screws and nuts. d) IS: 2629 For hot dip galvanising of steel & surface pre treatment. e) IS: 2633 For testing of uniformity of zinc coating. f) IS: 6745 For determination of mass of zinc coating. g) IS: 1367 Galvanised Coating on threaded Fasteners. (Part-XIII) h) IS: 1852 For Rolling and Cutting Tolerances of hot rolled steel products. i) IS: 9595 For Thickness of Welding. j) IS: 4759 For Hot Dip Zinc coating on structural steel and other allied products
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C. TECHNICAL PARAMETERS / DESIGN FEATURES**CABLE TRAYS & ACCESSORIES**

1	Material	Hot Rolled Mild Steel
2	Type	Ladder Type Perforated Type
3	Standard Straight Length	2.5 meters
4	Construction	Conforming to enclosed drawing
5	Tolerance in length / Width / Height	±2mm

SHEET THICKNESS before Hot Dip Galvanisation

	Cable trays accessories	2.0 mm
	Coupler plate	3.0 mm
	Tolerance in Thickness	As per IS: 1852

SURFACE TREATMENT

	Pre-treatment	IS 2629 before galvanisation
	Type	Hot dip galvanisation
	Minimum thickness	75 microns (minimum), 86 microns (average) for 2.0 mm thick product
	Min. weight of Zinc deposit	610 grams per square meter for 2.0 mm thick product

NUMBER OF COUPLER PLATES, BOLTS, WASHERS & NUTS REQUIRED FOR EACH CABLE TRAY SECTION (2.5 MTRS)

	COUPLER PLATE (nos.)	4
	NUTS (nos.)	16
	WASHERS (nos.)	32
	BOLTS (nos.)	16

D. PACKING

1	PACKING	<p>a) The material shall be packed to ensure protection against damage during transit, storage for prolonged periods and handling.</p> <p>b) Trays may be supplied in open condition. However, while stacking the materials for transportation it should be ensured that, similar items are grouped and tied with steel wires / strips for convenient handling and shall be done in such away to avoid damage during transits.</p> <p>d) Coupler plates, NUTS, BOLTS & WASHER shall be packed using gunny bags/bundles.</p> <p>c) The following details shall be marked on the packing/each stack: i) Name and address of the consignee ii) Purchase Order No: iii) Name of supplier iv) Description of material v) Quantity of items vi) Gross weight</p>
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	TECHNICAL SPECIFICATION & DATA SHEET FOR CABLE TRAYS & ACCESSORIES	Specification No.: PE-TS-499-507-E021
		Rev. No. 00
		Date : 06.09.2023

DOCUMENTATION REQUIREMENT

DRAWINGS & DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT:

BHEL Drawing No.	Drawing Title	Vendor submission (Days)*	BHEL & Customer comment/ approval (Days)
Primary Documents			
PE-V0-499-507-E011	Technical Datasheet for Cable Trays & Accessories	5	5
PE-V0-499-507-E012	GA Drawing for Cable Trays & Accessories	5	5
PE-V0-499-507-E902	Quality Plan for Cable Trays & Accessories	5	5
NOTES:			

a) * 1st submission within indicated days from date of purchase order.

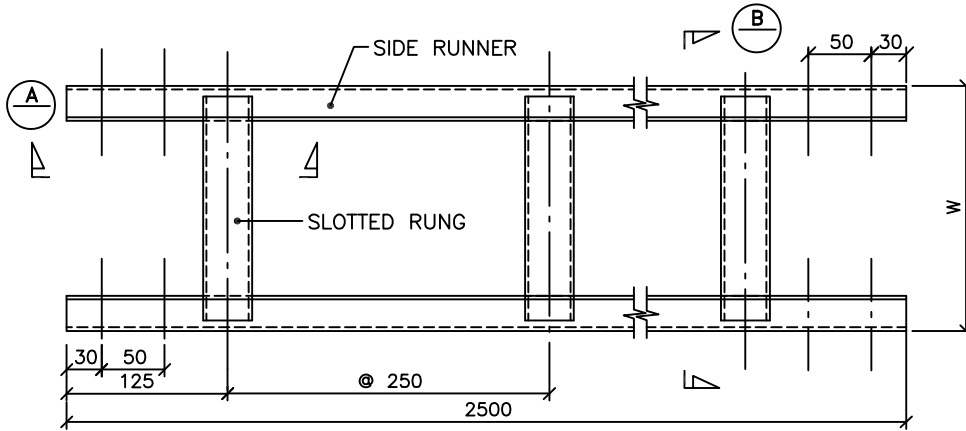
DRAWINGS & DOCUMENTS TO BE SUBMITTED AS FINAL/AS-BUILT DOCUMENT

Sl. No.	DOCUMENT TITLE
1	APPROVED QUALITY PLAN.

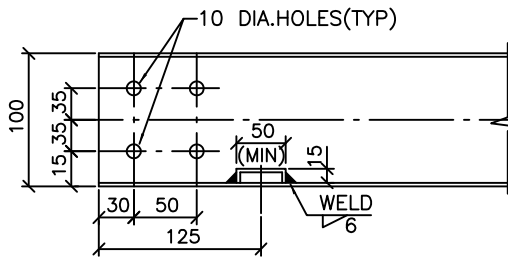
	TECHNICAL SPECIFICATION & DATA SHEET FOR CABLE TRAYS & ACCESSORIES	Specification No.: PE-TS-499-507-E021
		Rev. No. 00
		Date : 06.09.2023

GENERAL NOTES

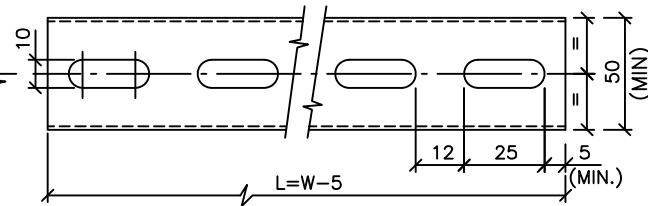
1. Load Test: A 2.5-meter straight section of each type of cable tray of width 600mm shall be simply supported at the two ends. A uniformly distributed load of 100 kg per meter shall be applied along the length of tray. The maximum deflection at mid span shall not exceed 7 mm.
2. All materials shall be procured, manufactured, inspected and tested by vendor/ sub-vendor as per approved quality plan.



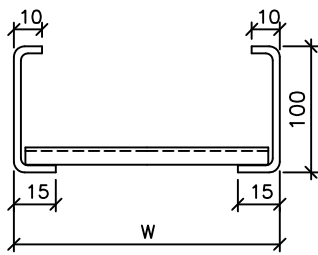
LADDER TYPE CABLE TRAY



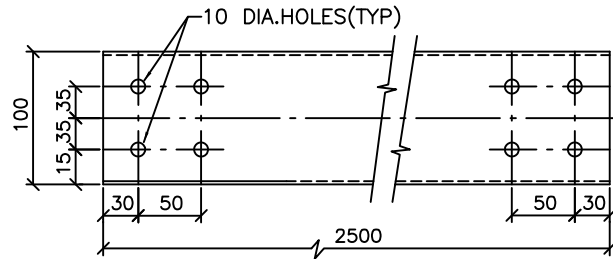
SEC - A



SLOTTED RUNG



SEC - B



SIDE RUNNER

W	150	300	600
L	145	295	595

MATERIAL : M.S. SHEET 14 SWG.(2mm.THK.)
FINISH : HOT DIP GALVANISED

NOTE :-

1. ALL DIMENSIONS ARE IN MM.

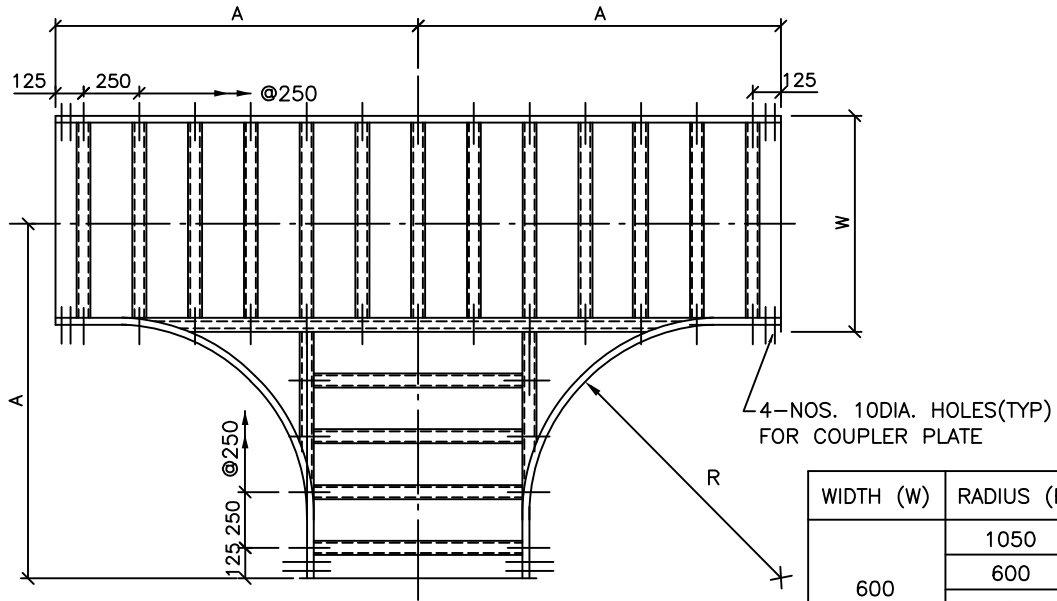
GA DRAWING OF CABLE TRAYS AND ACCESSORIES



DWG. NO.

PE-V0-445-507-E012

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PLAN
HORIZONTAL TEE

WIDTH (W)	RADIUS (R)	A
600	1050	1475
	600	1025
	450	875
	300	725
300	1050	1325
	600	875
	450	725
	300	575

NOTES :-

1. ALL DIMENSIONS ARE IN MM.
2. FOR MULTITIER CABLE TRAY, THE BENDING RADIUS AT THE BENDS SHALL BE SAME FOR ALL TRAYS AND THIS RADIUS SHALL BE AS PER THE RECOMMENDED BENDING RADIUS OF LARGEST CABLE IN THE ROUTE.
3. THE DIMENSION MENTIONED IN THE TABLE ARE ALSO SAME FOR PERFORATED TYPE HORIZONTAL TEE AND CROSS.

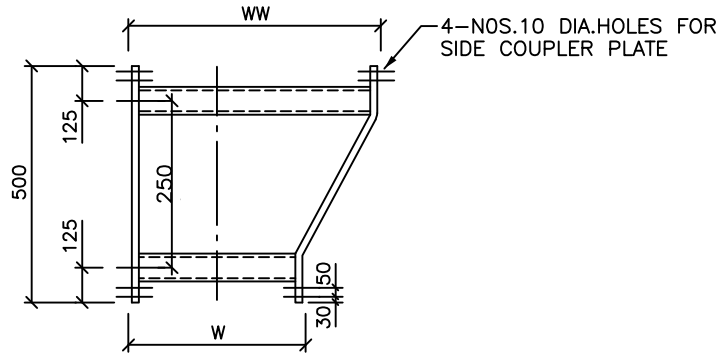
GA DRAWING OF CABLE TRAYS AND
ACCESSORIES



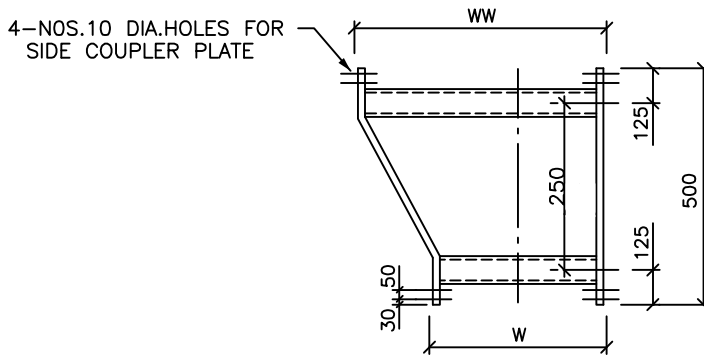
DWG. NO.

PE-V0-445-507-E012

REV.02 SHT. 05 OF 12



PLAN
LEFT HAND REDUCER



PLAN
RIGHT HAND REDUCER

WIDTH	WW	600
	W	300

NOTE :-

1. ALL DIMENSIONS ARE IN MM.

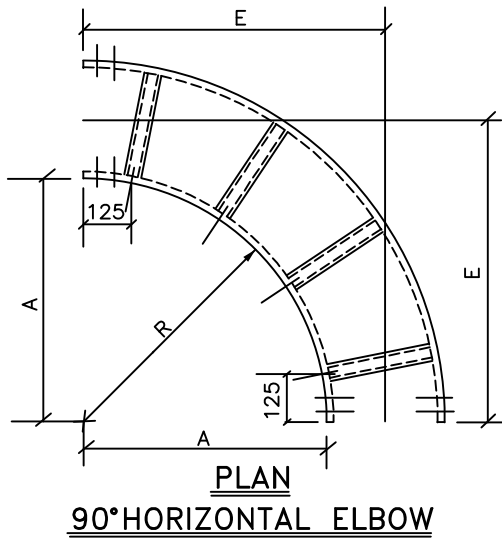


GA DRAWING OF CABLE TRAYS AND ACCESSORIES

DWG. NO.

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HORIZONTAL ELBOW			
WIDTH (W)	RADIUS (R)	A	E
600	1050	1175	1475
	600	725	1025
	450	575	875
	300	425	725
300	1050	1175	1325
	600	725	875
	450	575	725
	300	425	575

NOTES :-

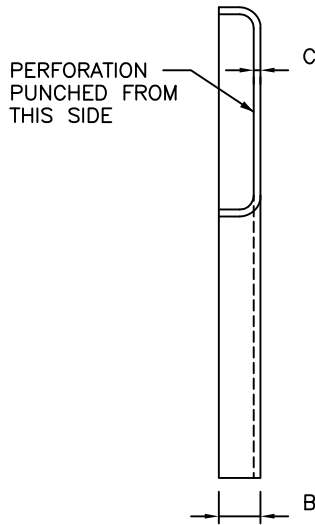
1. ALL DIMENSIONS ARE IN MM.
2. FOR MULTITIER CABLE TRAY, THE BENDING RADIUS AT THE BENDS SHALL BE SAME FOR ALL TRAYS AND THIS RADIUS SHALL BE AS PER THE RECOMMENDED BENDING RADIUS OF LARGEST CABLE IN THE ROUTE



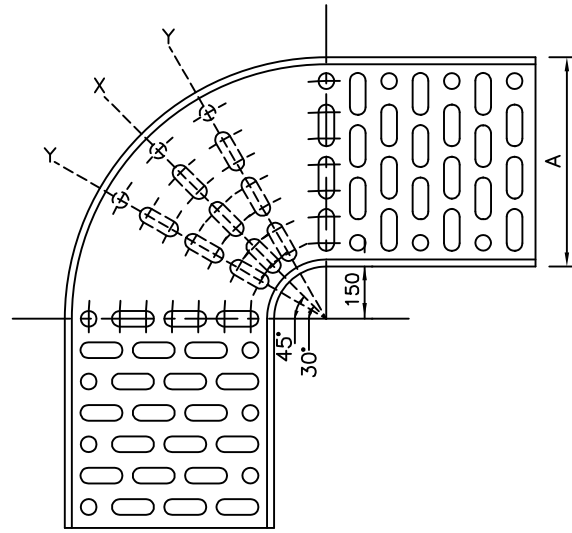
GA DRAWING OF CABLE TRAYS AND ACCESSORIES

DWG. NO.
PE-V0-445-507-E012

REV. 02 SHT. 07 OF 12



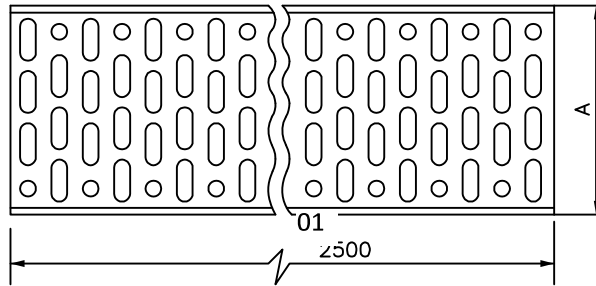
END ELEVATION



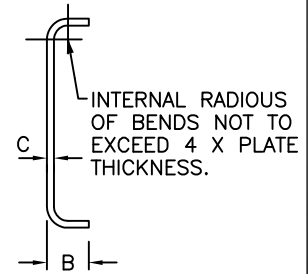
PLAN

DIMENSIONS IN MM	
WIDTH-A	DEPTH-B
50	50
100	
150	100
300	100
600	100

90° HORIZONTAL ELBOW

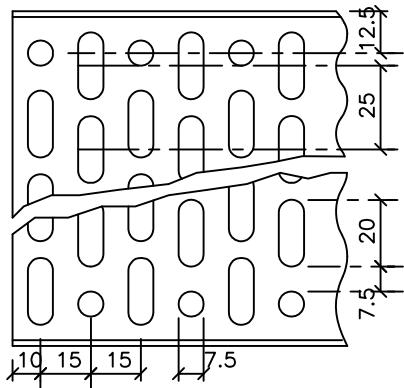


PLAN



END ELEVATION

STRAIGHT LENGTH



DETAILS OF PERFORATION

NOTES :

1. ALL CUTTING & FORMING OPERATIONS TO BE COMPLETED PRIOR TO GALVANIZING.
2. FINISHED TRAYS TO BE FREE FROM BURRS AND SHARP EDGES.
3. ALL DIMENSIONS ARE IN MM.

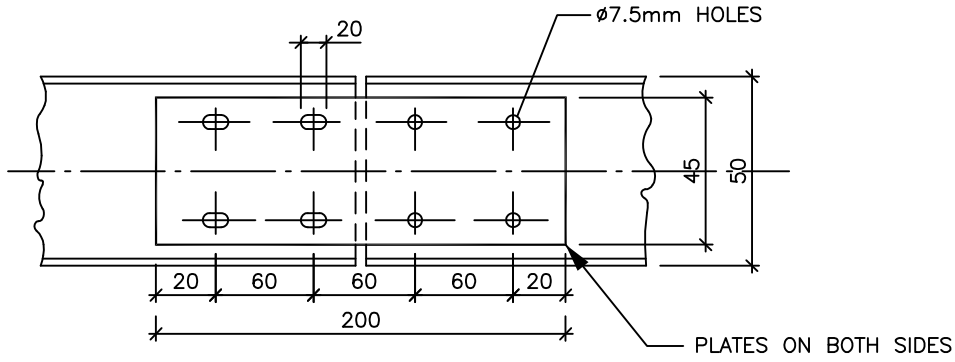
PERFORATED TYPE CABLE TRAY

GA DRAWING OF CABLE TRAYS AND ACCESSORIES

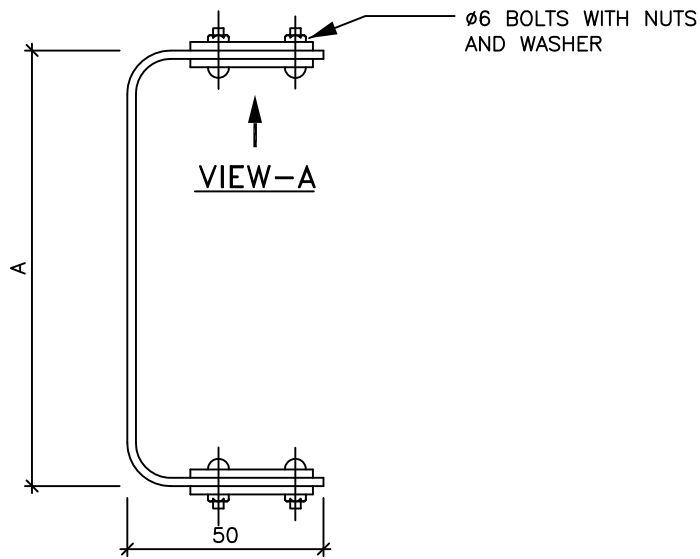


DWG. NO. PE-V0-445-507-E012

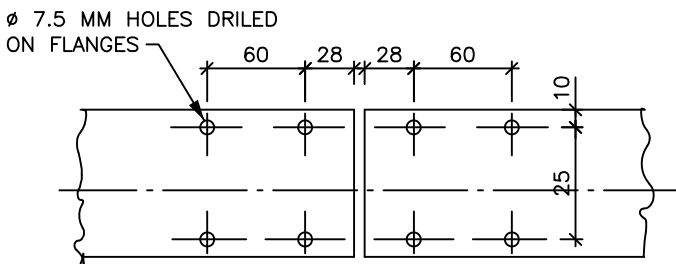
REV.02 SHT. 08 OF 12



VIEW-A



END ELEVATION



COUPLING PLATE

**PERFORATED TRAY (DEPTH 50mm) JOINING BY
COUPLING PLATES**

NOTES:-

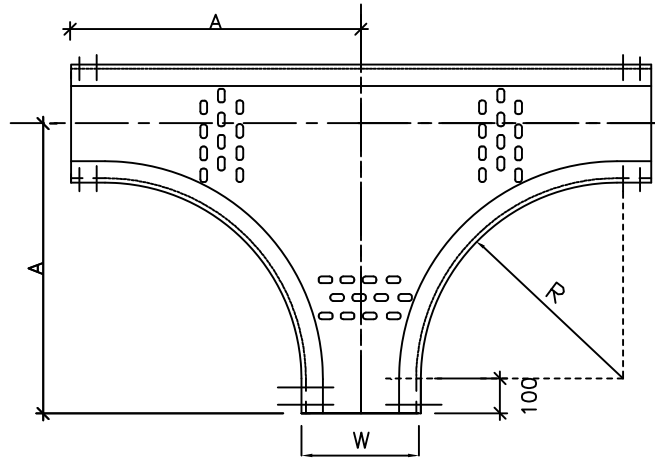
1. COUPLING PLATES 3 MM THICK M.S.
2. ALL DIMENSIONS ARE IN MM.



**GA DRAWING OF CABLE TRAYS AND
ACCESSORIES**

**DWG. NO.
PE-V0-445-507-E012**

REV.02 SHT. 09 OF 12



TEE

PERFORATED TYPE

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

GA DRAWING OF CABLE TRAYS AND ACCESSORIES



DWG. NO.
PE-V0-445-507-E012

REV. 02 SHT. 10 OF 12

NOTES:-

1. THE LADDER AND PERFORATED TYPE CABLE TRAYS AND ACCESSORIES (INCLUDING SIDE RUNNERS OF LADDER TYPE CABLE TRAYS), SIDE COUPLER PLATE AND CABLE TRAY COVER SHALL BE MADE OF HOT DIP GALVANISED AS PER IS 1079.
THICKNESS OF CABLE TRAYS & ACCESSORIES, SHALL BE 2MM
3MM SHEET SHALL BE USED FOR SIDE COUPLER PLATES.
2. THE CABLE TRAYS ACCESSORIES SHALL BE HOT DIP GALVANISED. AS PER IS 2629. GALVANIZATION SHALL BE UNIFORM & THICKNESS OF GALVANIZATION SHALL NOT BE LESS THAN 610 GRAMS/ SQ.MTR. ALSO ZINC DEPOSIT THICKNESS AT ANY POINT SHALL NOT BE LESS THAN 75 MICRONS.
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 FABRICATED WITH THE RADIUS INDICATED IN THIS DRAWING.
6. THE DIMENSIONS OF ALL BENDS, TEES, FOR PERFORATED CABLE TRAYS SHALL BE THE SAME AS FOR LADDER TYPE TRAY FITTINGS.
7. SIDE CHANNELS OF PERFORATED TRAY ACCESSORIES SHALL BE WELDED WITH THE PERFORATED SHEET AT INTERVALS OF 100mm.
8. LENGTH OF WELDING SHALL NOT BE LESS THAN 25mm.
9. ALL TRAY CORNERS SHALL BE SMOOTH AND FREE OF SHARP EDGES.
10. THE DEPTH, WIDTH AND LENGTH OF TRAYS SHALL BE WITHIN A TOLERANCE OF (+/-) 2 mm. THE THICKNESS TOLERANCE IS OF (+/-) 0.2 mm AS PER IS:1852.
11. TO FACILITATE ASSEMBLY, ALL ACCESSORIES AT ENDS SHALL HAVE 100mm STRAIGHT PORTION.
12. 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 BELOW 12 MM.
13. ALL CUTTING & FORMING OPERATIONS SHALL BE COMPLETED PRIOR TO GALVANIZING.
14. FINISHED TRAYS SHALL BE FREE FROM BURRS AND SHARP EDGES.
15. ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE.
16. THE PORTION OF GALVANIZED STEEL, WHICH, IF REQUIRED, UNDERGOES ANY WELDING AT SITE, SHALL BE COATED WITH TWO COATS OF COLD GALVANIZING ANTI-CORROSIVE PAINT AFTER WELDING.



GA DRAWING OF CABLE TRAYS AND
ACCESSORIES

DWG. NO.

PE-V0-445-507-E012

REV. ⁰² SHT. 12 OF 12

QUALITY PLAN

MANUFACTURER/ BIDDER/
SUPPLIER NAME & ADDRESS

SPEC. NO.:

DATE:

CUSTOMER :

QP NO.: PE-QP-999-507-E005, REV. 03

DATE: 13.02.20

PROJECT:

PO NO.:

DATE:

ITEM: CABLE TRAYS &
ACCESSORIES

SECTION: II

SHEET 1 OF 7

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLA SS	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	C/N		D	M	C	N
1.0 RAW MATERIAL											
1.1	HOT ROLLED CARBON STEEL SHEET	1.CHEM & PHY. PROPERTIES	MA	VERIFICATION OF TCS	100%	IS-1079	IS-1079	MILL 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	IS-209	IS-209	TC	P/V	V	V
2.0 IN-PROCESS											
2.1	FABRICATION	1.DIMENSIONS	MA	MEASUREMENT	100%	APPD.DRG	APPD.DRG	QC RECORD	P	V	
		2.WELDING QUALITY	MA	VISUAL	100%	ASME SEC. IX	ASME SEC. IX	QC RECORD	P	V	
											Welding is to be done by qualified welders in accordance with ASME SEC. IX article III, WPS, PQR & WPQ to be reviewed during inspection.

MANUFACTURER/
SUPPLIER NAME & ADDRESS

QUALITY PLAN

SPEC. NO.:

DATE:

CUSTOMER :

QP NO.: PE-QP-999-507-E005, REV. 03

DATE: 13.02.2023

PROJECT:

PO NO.:

DATE:

ITEM: CABLE TRAYS &
ACCESSORIES


SYSTEM: CABLING

SECTION: II

SHEET 2 OF 7

SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C/N				M	C	N	
1	2	3	4	5	6	7	8	9	*	**			
		3. SURFACE FINISH	MA	VISUAL	100%	FREE FROM DEFECTS & SLAG	FREE FROM DEFECTS & SLAG	QC RECORD	✓	P	V	V	
2.2	SURFACE PREPARATION	1. CLEANING, PICKLING & FLUXING	MA	VISUAL	100%	IS:2629	IS:2629	QC RECORD		P	-	-	
		2. SURFACE FINISH	MA	VISUAL	100%	IS:2629	IS:2629	QC RECORD		P	-	-	
2.3	GALVANISING	1. TEMPERATURE OF ZINC BATH	MA	MEASUREMENT	CONTINUOUS	IS-2629	IS-2629	QC RECORD		P	-	-	
		2. DROSS	MA	VISUAL	PERIODIC	IS-2629	IS-2629	QC RECORD		P	-	-	
		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	-	-	

Galvanization is to be done at galvanisation plant listed in annexure-2 to quality plan.

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS		QUALITY PLAN				SPEC. NO.:	DATE:
	CUSTOMER :						QP NO.: PE-QP-999-507-E005, REV. 03	DATE: 13.02.2023
	PROJECT:						PO NO.:	DATE:
	ITEM: CABLE TRAYS & ACCESSORIES		SYSTEM: CABLING				SECTION: II	SHEET 3 OF 7

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	<table border="1"> <tr> <td>6</td> <td>C/ N</td> </tr> <tr> <td>M</td> <td>C/ N</td> </tr> </table>	6	C/ N	M	C/ N	7	8	9	<table border="1"> <tr> <td>**</td> <td>M</td> <td>C</td> <td>N</td> </tr> <tr> <td>*</td> <td>D</td> <td></td> <td></td> </tr> </table>	**	M	C	N	*	D				
6	C/ N																						
M	C/ N																						
**	M	C	N																				
*	D																						
3.0 FINISHED ITEMS																							
3.1	(CABLE TRAY, ACCESSORIES & HARDWARES)	1. DIMENSIONS	MA	MEASUREMENT	IS-2500 (PART 1) LEVEL S-4	APPD.DRG	APPD.DRG	INSP.REPORT	P	W	Overall thickness of finished product shall not be less than the thickness of cable tray & accessories defined in technical datasheet.												
		2. SURFACE FINISH	MA	VISUAL	IS-2500 (PART 1) LEVEL S-4	APPD.DRG	FREE FROM BURRS, SLAG, ROUGHNESS, F LUX, STAIN ETC.	INSP.REPORT	P	W	Fasteners shall be of good quality as per IS 1363												
		3. MARKING	MA	VISUAL	IS-2500 (PART 1) LEVEL S-4	APPD.DRG	APPD.DRG	INSP.REPORT	P	W													

QUALITY PLAN		SPEC. NO. :	DATE:
CUSTOMER :		QP NO.: PE-QP-999-507-E005, REV. 03	DATE: 13-02-2023
PROJECT:		PO NO.:	DATE:
ITEM: CABLE TRAYS & ACCESSORIES		SYSTEM: CABLING	SECTION: II
			SHEET 4 OF 7

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C/N				M	C	N	
1	2	3	4	5	6	C/N	7	8	9	*	D	**	


3.0 FINISHED ITEMS

4 RIGIDITY (FOR TRAYS)	5 MASS OF ZINC COATING	6 UNIFORMITY OF ZINC COATING																																	
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>DEFLECTION TEST</td> <td>MA</td> <td>2 No./ LOT/ TYPE</td> <td>APPD. DRG</td> <td>APPD. DRG</td> <td>INSP.REPORT</td> <td>√</td> <td>P</td> <td>W</td> <td>-</td> <td>600MM wide cable tray to be tested. Maximum deflection shall not exceed 7MM on mid span on uniform loading of 100KG/M.</td> </tr> </table>	DEFLECTION TEST	MA	2 No./ LOT/ TYPE	APPD. DRG	APPD. DRG	INSP.REPORT	√	P	W	-	600MM wide cable tray to be tested. Maximum deflection shall not exceed 7MM on mid span on uniform loading of 100KG/M.	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>CHEM. TEST</td> <td>MA</td> <td>IS-4759</td> <td>IS-6745</td> <td>610 gms/ Sq m (for 2.0mm thick product)</td> <td>INSP.REPORT</td> <td>√</td> <td>P</td> <td>W</td> <td>-</td> <td></td> </tr> </table>	CHEM. TEST	MA	IS-4759	IS-6745	610 gms/ Sq m (for 2.0mm thick product)	INSP.REPORT	√	P	W	-		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>CHEM. TEST</td> <td>MA</td> <td>IS-4759</td> <td>IS-2633</td> <td>460 gms/ Sq m (for 1.6 mm thick product)</td> <td>INSP.REPORT</td> <td>√</td> <td>P</td> <td>W</td> <td>-</td> <td></td> </tr> </table>	CHEM. TEST	MA	IS-4759	IS-2633	460 gms/ Sq m (for 1.6 mm thick product)	INSP.REPORT	√	P	W	-	
DEFLECTION TEST	MA	2 No./ LOT/ TYPE	APPD. DRG	APPD. DRG	INSP.REPORT	√	P	W	-	600MM wide cable tray to be tested. Maximum deflection shall not exceed 7MM on mid span on uniform loading of 100KG/M.																									
CHEM. TEST	MA	IS-4759	IS-6745	610 gms/ Sq m (for 2.0mm thick product)	INSP.REPORT	√	P	W	-																										
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QUALITY PLAN		SPEC. NO. :	DATE:
CUSTOMER :		QP NO.: PE-QP-999-507-E005, REV. 03	DATE: 13.02.2023
PROJECT:		PO NO.:	DATE:
ITEM: CABLE TRAYS & ACCESSORIES		SYSTEM: CABLING	SHEET 5 OF
		SECTION: II	

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
					M	C/N				M	C	N	
1	2	3	4	5	6	7	8	9	*	**			
		7. THICKNESS OF ZINC COATING	MA	PHYSICAL TEST	IS-4759	75 MICRONS (MINIMUM), 86 MICRONS (AVERAGE) for 2.0mm thick product.	75 MICRONS (MINIMUM), 86 MICRONS (AVERAGE) for 2.0mm thick product.		D				
		8. ADHESION	MA	MECH. TEST	IS-4759	55 MICRONS (MINIMUM), 65 MICRONS (AVERAGE) for 1.6mm thick product.	55 MICRONS (MINIMUM), 65 MICRONS (AVERAGE) for 1.6mm thick product.	INSP REPORT	✓	P	W		
						IS-2629	IS-2629		INSP. REPORT	✓	P	W	



	QUALITY PLAN		SPEC. NO. :	DATE:
	CUSTOMER :		QP NO.: PE-QP-999-507-E005, REV. 03	DATE: 13.02.2023
	PROJECT:		PO NO.:	DATE:
	ITEM: CABLE TRAYS & ACCESSORIES		SYSTEM: CABLING	SECTION: II

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/ N			D	M	C	N		
1	2	3	4	5	6	7	8	9	*	**				
		9. COUPLER PLATE	MA	VISUAL	100%	BHEL APPD. DOCUMENT	BHEL APPD. DOCUMENT	INSP.REPORT	✓	P	W			INSPECTOR TO MENTION THE TOTAL NUMBER OF GUNNY BAGS/BUNDLES OF COUPLER PLATES, NUTS, BOLTS & WASHER IN THE INSPECTION REPORT.
		10. NUT & BOLT	MA	VISUAL	100%	BHEL APPD. DOCUMENT	BHEL APPD. DOCUMENT	INSP.REPORT	✓	P	W			FURTHER MANUFACTURER SHALL ATTACH THE DETAIL OF TOTAL NUMBER OF GUNNY BAGS/BUNDLES OF THE RESPECTIVE ITEMS WITH PACKING LIST.
		11. WASHER	MA	VISUAL	100%	BHEL APPD. DOCUMENT	BHEL APPD. DOCUMENT	INSP.REPORT	✓	P	W			
		12. PACKING	MA	VISUAL	100%	BHEL APPD. DOCUMENT	BHEL APPD. DOCUMENT	INSP.REPORT	✓	P	V			

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	QUALITY PLAN	SPEC. NO :	DATE:
CUSTOMER :		QP NO.: PE-QP-999-507-E005, REV. 03	PO NO.:	DATE: 13.02.2020
PROJECT:		SYSTEM: CABLING	SECTION: II	SHEET 7 OF
ITEM: CABLE TRAYS & ACCESSORIES				

NOTES:

1. BHEL RESERVE THE RIGHT FOR CONDUCTING REPEAT TEST IF REQUIRED.

LEGENDS:

*RECORDS, IDENTIFIED WITH "TICK"(√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION, **D:** DOCUMENTATION
**** M:** SUPPLIER/MANUFACTURER/SUB-SUPPLIER, **C:** MAIN SUPPLIER/BHEL/ THIRD PARTY INSPECTION AGENCY, **N:** CUSTOMER,
P: PERFORM, **W:** WITNESS, **V:** VERIFICATION, AS APPROPRIATE
MA: MAJOR, **MI:** MINOR, **CR:** CRITICAL

ANNEXURE-2 to QUALITY PLAN (LIST OF APPROVED GALVANIZERS)			
ITEM DESCRIPTION	SL NO.	VENDOR NAME	ADDRESS
GALVANISING	1	Jenco Industrial Corporation	Chincholi Bunder Khkar Road Near Link Road Devruwadi Malad (W) Mumbai 400064
GALVANISING	2	National Galvanizing Company	66, Barrackpore Kamarhatt Trunck Road Calcutta-700058
GALVANISING	3	Sigma Galvanising Pvt. Ltd.	Plot No.C-169, TTC, MIDC Ind Area Navin Mumbai-400705
GALVANISING	4	B.P. Projects PVT LTD	167A, Vivekananda Road Kolkata-700006
GALVANISING	5	Standard Galvanisers	Makardah Road, Kabar Para, Bankra, Howarah -711403
GALVANISING	6	Steel Products	National Highway No. 6, Chamrail, Kona, Howrah-711114
GALVANISING	7	Unitech Fabricators & Engineers Pvt. Ltd.	Village- Ajab Nagar, P.O. -Molla Simlla, P.S. - Singur, Dist - Hoogly, Pin-712223
GALVANISING	8	Shivam Engineers & Fabricators	A0-282-284, Industrial Area, South Side of G.T. Road, Ghaziabad, U.P.
GALVANISING	9	B.G. Shirke Construction Technology Pvt. Ltd	72-76, Mundhawa, Pune - 401 036
GALVANISING	10	Galbro Ispat Galvanizers Pvt. Ltd.	GUT 11 AND 12, OPP. Kudus Steel,Rolling Mill, Wada, Thane , Mumbai
GALVANISING	11	Eros Metals	G-97, MIDC, Bhutibori , Nagpur
GALVANISING	12	Industrial Perforation (India) Pvt. Ltd.	Ganganagr, Katakhal, Kolkata-700132
GALVANISING	13	Indmark Formtech Pvt. Ltd.	Phase - 3, E - 11 / 1, M. I. D. C., Chakan, Pune - 410 501, Maharashtra, India.
GALVANISING	14	Namdhari Industrial Traders Pvt. Ltd.	Village Latton Dana, Chandigarh Road, Ludhiana
GALVANISING	15	Neha Galvaniser	Jalan Industrial Estate, Gate No-1, 1st Right Choise Lane, Near N.G-6, Jangalpur, PO Domjur Howrah - 700071, West Bengal, India
GALVANISING	16	Patny Systems (P) Ltd.	Unit-IV, Sy No. -228/9, Plot No. 6, IP Kuchavaram, Toopran(M) Dist.- Medak, Telegana - 502336
GALVANISING	17	Parmar Metal Company	Survey No.207,Veraval (Shapar) Dist. Rajkot, India.
GALVANISING	18	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
GALVANISING	19	DMP Projects Pvt.Ltd.	Dulagarh Industrial Park , PS-Sankrail , Howrah -711302
GALVANISING	20	Vinfab Engineers India Private Limited	Gut no. 224/1 &2 Bhiwandi Wada State Highway, Village khupri, Dist. Thane, Maharashtra -421303
GALVANISING	21	Saral Projects & Processors	B-1, Industrial Area, Site-II, Amawan Road Rae Bareli
GALVANISING	22	Brahampuri Steels Limited	172 (F) Industrial Area, Jhotwara, Jaipur-302013
GALVANISING	23	Indiana Gratings PVT. LTD	F-5, MIDC Jejuri, Pune-412 303
GALVANISING	24	M/s AVAIDS TECHNOVATORS PVT. LTD.	131, MATSYA INDUSTRIAL AREA, ALWAR RAJASTHAN
GALVANISING	25	M/s Ratan Projects & Engineering Co. Pvt. Ltd.	VILL Muslim Para, PO- Barunda, P.S – Bagnan, Howrah – 711 303

NOTES:

1. ANY CHANGE IN THE ABOVE LIST SHALL BE INFORMED BY BHEL AT THE TIME OF SPECIFIC PROJECT REQUIREMENT AND NO COMMERCIAL IMPLICATION SHALL BE ALLOWED ON THIS ACCOUNT.
2. IT SHALL BE THE RESPONSIBILITY OF THE VENDOR TO GET THE MATERIAL GALVANIZED AS PER ABOVE WITHOUT ANY COMMERCIAL IMPLICATION TO BHEL.

	<u>Price Variation Formulae</u>	ANNEXURE-B
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Prices shall be variable as per following PVC formulae: -

Cable Trays & Accessories	
$P = P_o/100 (20 + 58 (SBIR/SBIR_o) + 7 (Zn/Zn_o) + 15 (W/ W_o))$	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.

P_o = Price quoted/confirmed.

SBIR_o = 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.

Zn_o = 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_o = 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 index number is as applicable on the first 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 index number is as applicable on the first 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.



Price Variation Formulae

ANNEXURE-B

Notes:

- (a) 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.
- (b) All prices are as on first working day of the month.
- (c) PVC ceiling limit shall be positive (+ve) 20% and negative (-ve) unlimited.