

VOLUME II

RATE CONTRACT

TECHNICAL SPECIFICATION

FOR

CABLE TRAYS & ACCESSORIES

SPECIFICATION NO: PE-RC-999-507-E021

REVISION: 00



BHARAT HEAVY ELECTRICALS LIMITED

POWER SECTOR

PROJECT ENGINEERING MANAGEMENT

NOIDA, UP (INDIA) – 201301



TECHNICAL SPECIFICATION FOR CABLE TRAYS & ACCESSORIES

SPECIFICATION NO. PE-RC-999-507-E021

REVISION 0

DATE: 26.02.2025

SHEET 1 OF 1

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	TOTAL SHEETS INCLUDING COVER SHEET, CONTENT/SEPARATOR SHEET =	30



**TECHNICAL SPECIFICATION FOR
CABLE TRAYS & ACCESSORIES**

SPECIFICATION NO. PE-RC-999-507-E021

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SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS



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COMPLIANCE CERTIFICATE

The bidder shall confirm compliance to the following by signing/ stamping this compliance certificate and furnishing same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same
2. There are no deviation with respect to specification.
3. Only those technical submittals which are specifically asked for in NIT to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as part of offer.
4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.
5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in 'BOQ-Cum-Price schedule' enclosed with NIT shall not be considered (i.e., technical description & quantities as per the specification shall prevail).

BIDDER'S STAMP & SIGNATURE



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1.0 SCOPE OF ENQUIRY

- 1.1 Manufacture, Inspection and Testing at Manufacturer's works, proper packing and delivery to site of cable trays & accessories conforming to this specification.
- 1.2 It is not the intent to specify herein all the details of design & manufacture of material. However, the material shall, conform in all respects to high standard of design, engineering and workmanship and shall be capable of performing in continuous commercial operation at site conditions.
- 1.3 Technical requirements of cable trays & accessories are indicated in Section-I under Data Sheet-A & drawing "Typical Details of Cable Trays & Accessories". Standard technical details are indicated in Section-II.
- 1.4 The stipulation of Section-I (Data Sheet-A & drawing "Typical Details of Cable Trays & Accessories") shall prevail in case of any conflict between the stipulations of Section-I & Section-II.

2.0 BILL OF QUANTITIES

The bidder to quote for items as per 'BOQ-cum-Price Schedule' attached with NIT.

3.0 DRAWINGS & DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT

- 3.1 Following documents/drawings shall be submitted after placement of order (**for specific project**) for BHEL & customer's approval.

Sl. No.	Drawings / Document Description	Document Number	Document Type	Drg Sch for Vendors
1	Technical Data Sheet for Cable trays & Accessories	PE-V0-XXX-507-E011	Primary	R-0 within 7 days from PO & subsequent revisions within 5 days of comments received from BHEL. BHEL shall furnish comments / approval on each submission within 7 days from receipt.
2	GA drawings of Cable Trays & Accessories	PE-V0-XXX-507-E012	Primary	
3	Quality Plan for Cable Trays & Accessories	PE-V0-XXX-507-E902	Primary	

- 3.2 Drawings/ documents shall be submitted through Document Management System (DMS).



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SECTION-I

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DATASHEET-A

1.0 APPLICABLE STANDARDS

- | | | |
|----|----------|--|
| 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 |

2.0 CABLE TRAYS & ACCESSORIES

- | | | | |
|-----|---|---|---|
| 2.1 | Material | : | Hot Rolled Mild Steel |
| 2.2 | Type | : | Ladder Type
Perforated Type |
| 2.3 | Standard Length of
Straight Length of
Cable Trays | : | 2.5 meters |
| 2.4 | Standard Width (mm) | : | 600 300 150 (Ladder)
600 300 150 100 50 (Perforated) |
| 2.5 | Construction | : | Conforming to enclosed drawing
(Typical Details of Cable Trays & Accessories, PE-DG-RC-507-E005) |
| 2.6 | Bending Radius
of Accessories (in mm) | : | 600 mm |
| 2.7 | Tolerance in length/
Width / Height | : | + /- 2 mm |

2.8 Thickness of the finished product shall not be less than 2.0 mm.

3.0 FITTINGS

- | | | |
|-----------------|---|---|
| End connections | : | Through Coupler plates
(Side Coupler Plates shall be provided as part of cable tray &
accessories supply with bolts, nuts, washers etc) |
|-----------------|---|---|

4.0 TRAY COVERS

- | | | |
|-------------|---|------------------------------------|
| a) Type | : | Non-Perforated type. |
| b) Material | : | Hot Rolled Mild Steel. |
| c) Width | : | Suitable for width of cable trays. |



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- d) Tolerance in length/
Width / height : Same as cable trays.
- e) Construction : Conforming to enclosed drawing
(Typical Details of Cable Trays & Accessories, PE-DG-RC-507-E005)
- f) Thickness of the finished product shall not be less than 1.6 mm.

4.0 CABLE TROUGHS

- a) Material : Hot Rolled Mild Steel.
- b) Width (mm) : 50mm & 75mm
- c) Tolerance in length/
Width / height : Same as cable trays.
- e) Construction : Conforming to enclosed drawing
(Typical Details of Cable Trays & Accessories, PE-DG-RC-507-E005)
- f) Thickness of the finished product shall not be less than 2 mm.

5.0 SHEET THICKNESS before Hot Dip Galvanisation

- a) For cable trays &
Accessories : 2.0 mm
- b) For cable trough : 2.0 mm
- c) For cable tray cover : 1.6 mm
- d) For Coupler plate : 3.0 mm
- e) Tolerance in Thickness : As per IS: 1852

6.0 SURFACE TREATMENT

- a) Pre-treatment : IS 2629 before galvanisation
- b) Type : Hot dip galvanisation
- c) Applicable Standard : IS 2629
- d) Minimum thickness : 75 microns (minimum), 86 microns (average) for 2.0 mm thick product
55 microns (minimum), 65 microns (average) for 1.6 mm thick product
- e) Min. weight of
Zinc deposit : 610 grams per square meter for 2.0 mm thick product
460 grams per square meter for 1.6 mm thick product
- f) Tests for galvanizing : (i) Weight of Zinc Coating as per IS 6745.



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- (ii) Thickness of Zinc Coating as per IS 4759.
- (iii) Uniformity of Zinc Coating as per IS 2633.
- (iv) Adhesion Test as per IS 2629.

7.0 DEFLECTION TEST ON CABLE TRAYS

- 7.1 One piece each of 2.5m length of cable tray of 300mm & above shall be taken as sample from each offered lot. It shall be supported at both end & loaded with uniform load of 76 kg/metre along the length of cable tray. The maximum deflection at the mid-span of each size shall not exceed 7mm


8.0 PACKING SPECIFICATION

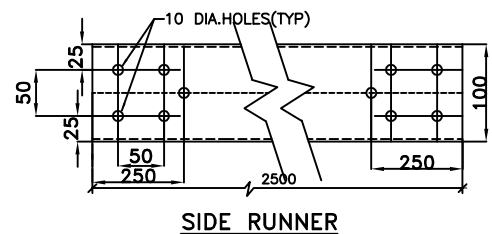
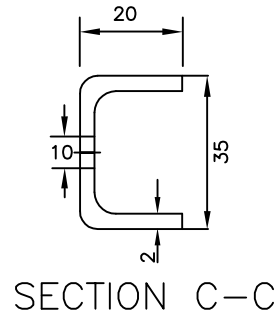
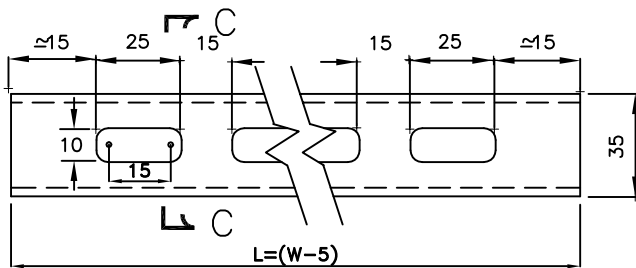
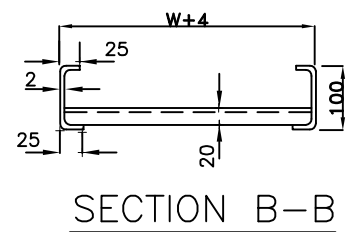
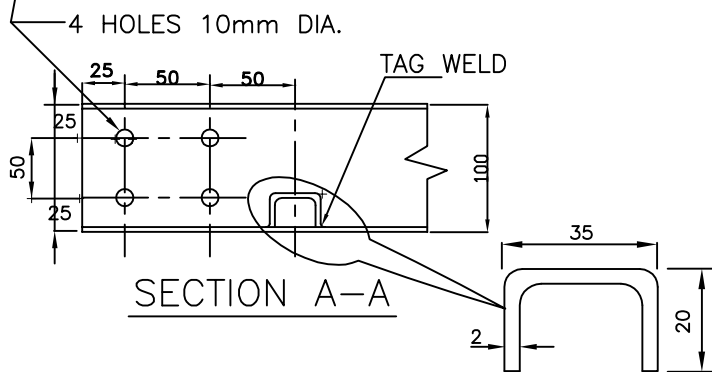
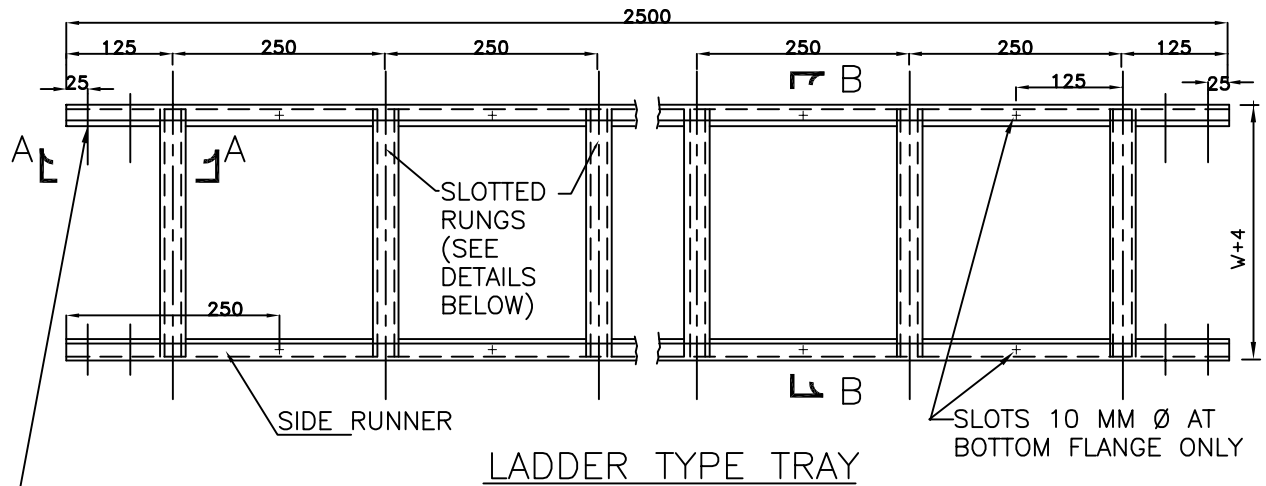
- 8.1 Packing requirement is attached as Annexure-B to Quality Plan under Section-II of technical specification.

9.0 SOURCE OF STEEL & ZINC

The supplier to ensure procurement of steel from main producers like SAIL / TISCO / RINL / ISPAT IND./ JINDAL / ESSAR / LLOYDs / IISCO and Zinc from Hindustan Zinc Limited.

TYPICAL DETAILS OF CABLE TRAYS AND ACCESSORIES DRG. NO. PE-DG-RC-507-E005

CUSTOMER							
PROJECT							
JOB NO.	<div></div> <div>BHARAT HEAVY ELECTRICALS LIMITED POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA(U.P) INDIA</div>	DPT CODE-E	DRN	NAME	SIGN	DATE	
			DSN	RKS	-sd-	28.02.25	
			CHD	AB	-sd-	28.02.25	
			APP	SL	-sd-	28.02.25	
		DWG. NO.	PE-DG-RC-507-E005				
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W	150	300	600
L	145	295	595

FOR GENERAL NOTES, REFER SHEET 13 OF 13

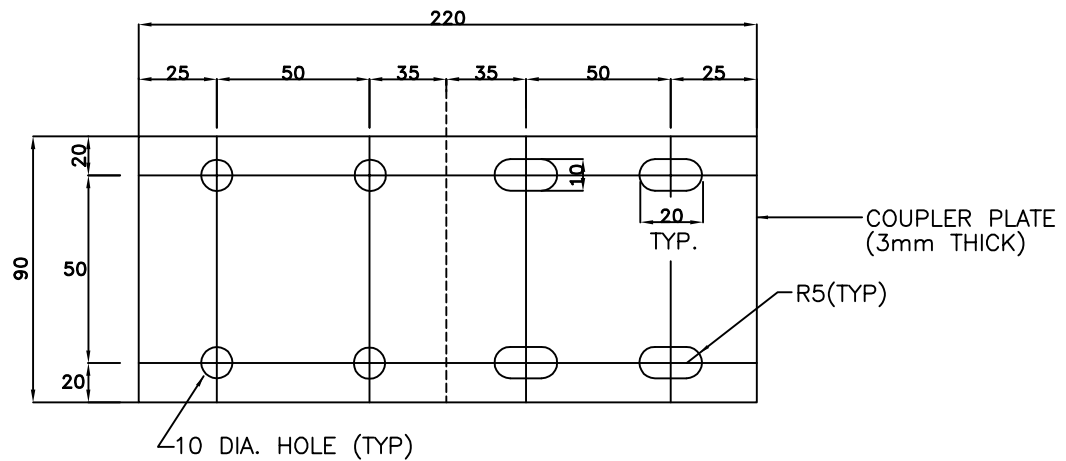


TYPICAL DETAILS OF CABLE TRAYS AND
ACCESSORIES (HOT DIP GALVANIZED)

DWG. NO.
PE-DG-RC-507-E005

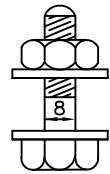
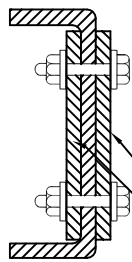
SHT. 02 OF 13

REV.0



**SIDE COUPLER PLATE (3mm THICK) FOR
LADDER/PERFORATED TYPE TRAYS
(600/300/150W TRAYS)**

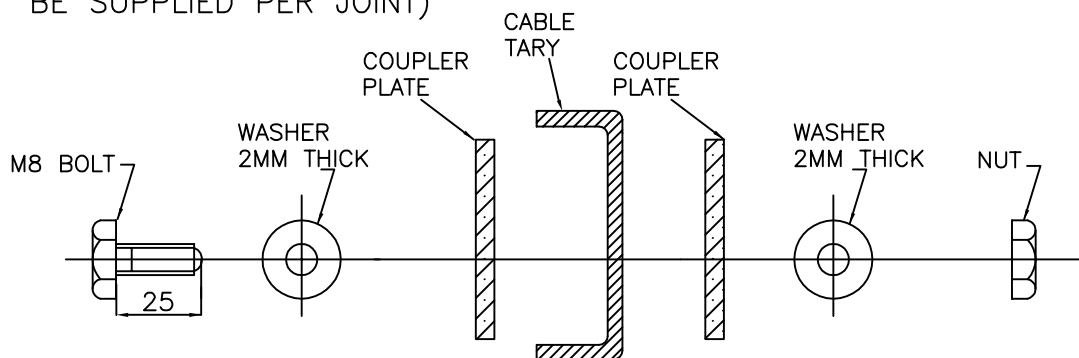
QTY. REQUIRED/TRAY SECTION : 4 NOS.



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 13 OF 13

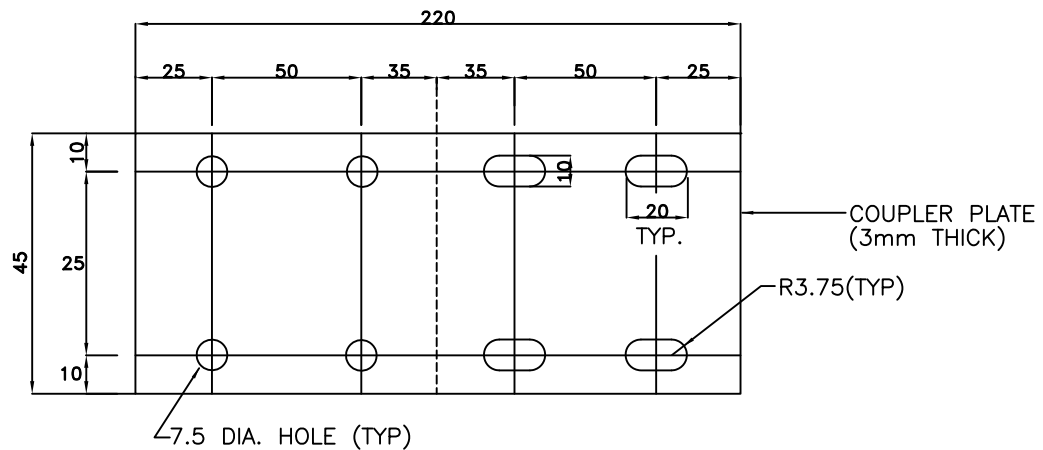


**TYPICAL DETAILS OF CABLE TRAYS AND
ACCESSORIES (HOT DIP GALVANIZED)**

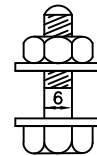
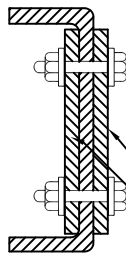
DWG. NO.
PE-DG-RC-507-E005

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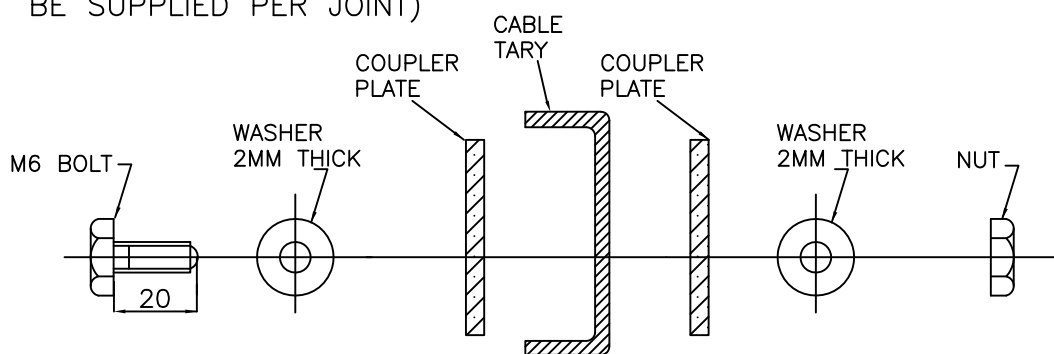
**SIDE COUPLER PLATE (3mm THICK) FOR
PERFORATED TYPE TRAYS (100W/50W TRAYS)**
QTY. REQUIRED/TRAY SECTION : 4 NOS.



QTY. REQD/TRAY SECTION

- A) 16 NOS. M6 BOLTS
- B) 16 NOS. NUTS
- C) 32 NOS. WASHERS

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



SEQUENCE OF M6 BOLT, WASHER, NUT, COUPLER PLATE & CABLE TRAY
FOR TYPICAL CABLE TRAY JOINT

FOR GENERAL NOTES, REFER SHEET 13 OF 13

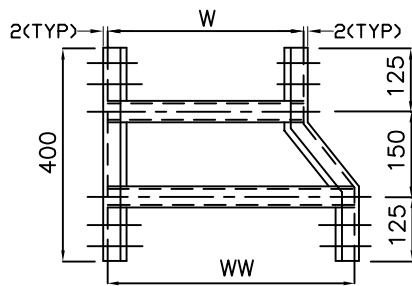


TYPICAL DETAILS OF CABLE TRAYS AND
ACCESSORIES (HOT DIP GALVANIZED)

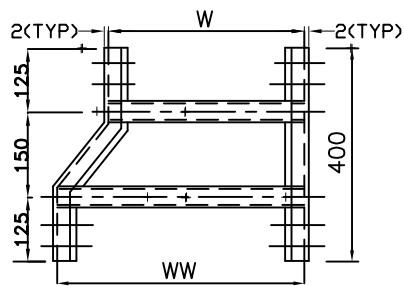
DWG. NO.
PE-DG-RC-507-E005

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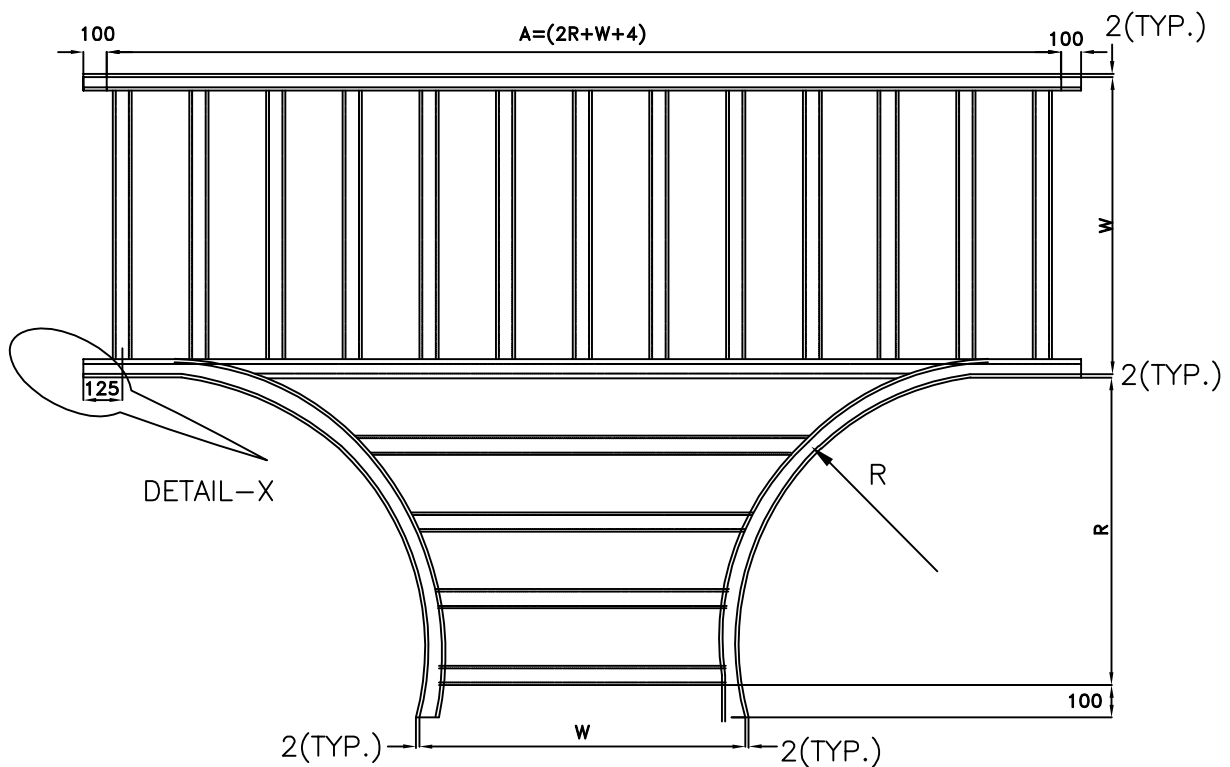
LEFT HAND REDUCER



RIGHT HAND REDUCER

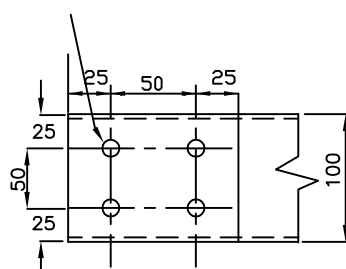
WW	W	DEPTH
600	300	100
300	150	100

LADDER TYPE



HORIZONTAL TEE-PLAN

10mm DIA. HOLES



DETAIL-X

WIDTH W	BENDING RADIUS R	DEPTH	A		
			W		
			150	300	600
150, 300, 600	600	100	1354	1504	1804

LADDER TYPE

FOR GENERAL NOTES, REFER SHEET 13 OF 13

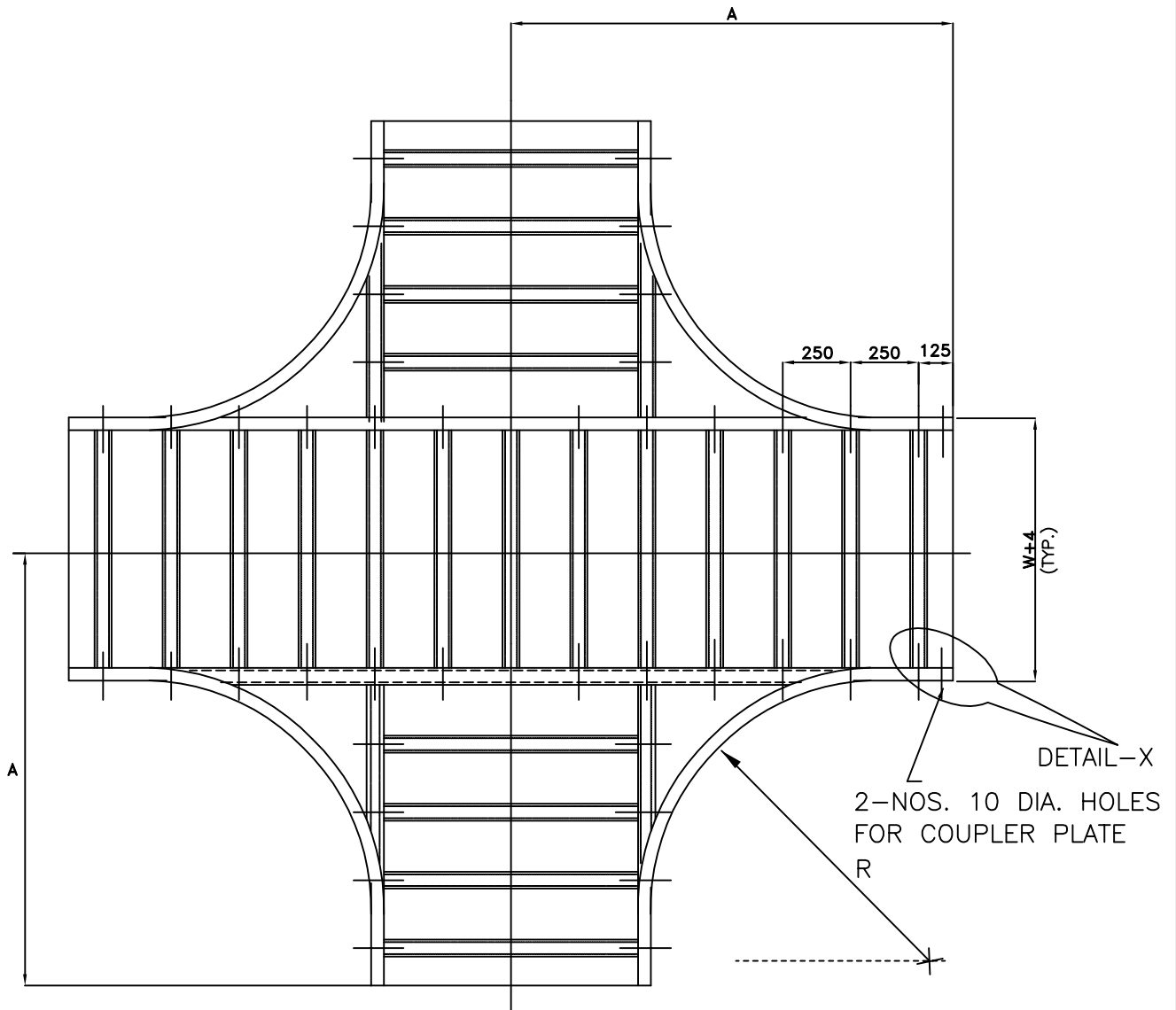


TYPICAL DETAILS OF CABLE TRAYS AND
ACCESSORIES (HOT DIP GALVANIZED)

DWG. NO.
PE-DG-RC-507-E005

SHT. 05 OF 13

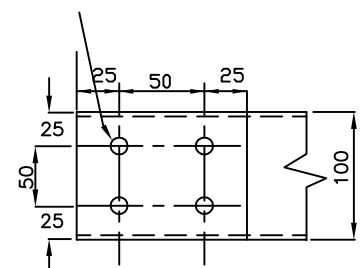
REV.0



HORIZONTAL CROSS-PLAN

WIDTH W	BENDING RADIUS R	$A=R+(W+4)/2+100$
600	600	1002
300	600	852

10mm DIA. HOLES



DETAIL-X

FOR GENERAL NOTES, REFER SHEET 13 OF 13

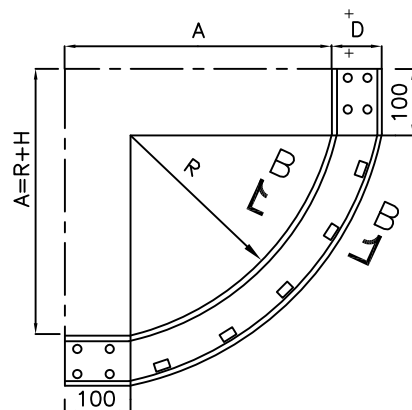


TYPICAL DETAILS OF CABLE TRAYS AND
ACCESSORIES (HOT DIP GALVANIZED)

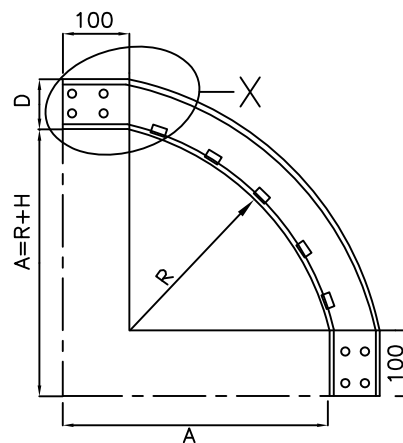
DWG. NO.
PE-DG-RC-507-E005

SHT. 06 OF 13

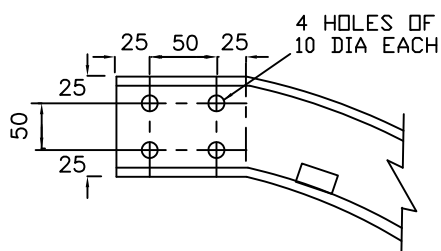
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INSIDE TYPE



OUTSIDE TYPE

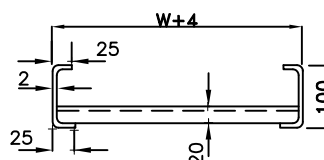


ENLARGED VIEW OF "X"

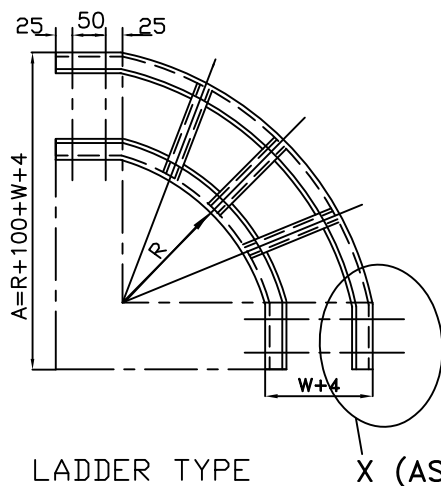
90° VERTICAL BEND - LADDER TYPE

VERTICAL ELBOW 90 DEG UP/DOWN

INSIDE WIDTH W	BENDING RADIUS R	DEPTH	A
600, 300 & 150	600	100	700



SECTION B-B



LADDER TYPE

X (AS ABOVE)

HORIZONTAL ELBOW 90 DEG

INSIDE WIDTH W	BENDING RADIUS R	DEPTH	A		
			150	300	600
600, 300 & 150	600	100	854	1004	1304

90° HORIZONTAL BEND - LADDER TYPE

LADDER TYPE ACCESSORIES

FOR GENERAL NOTES, REFER SHEET 13 OF 13

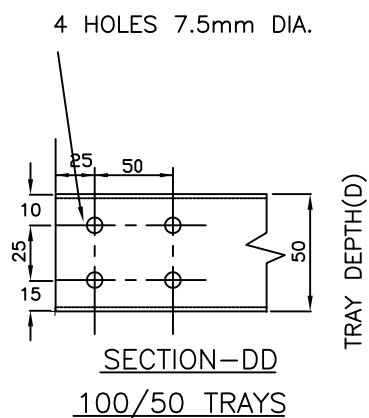
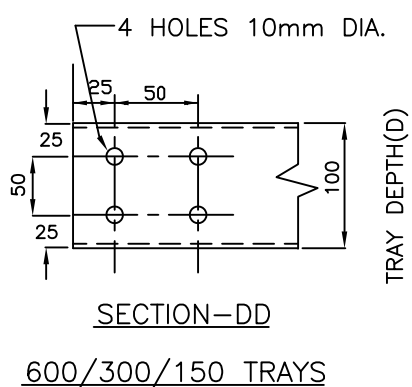
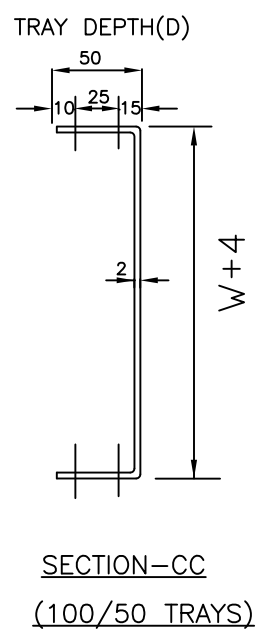
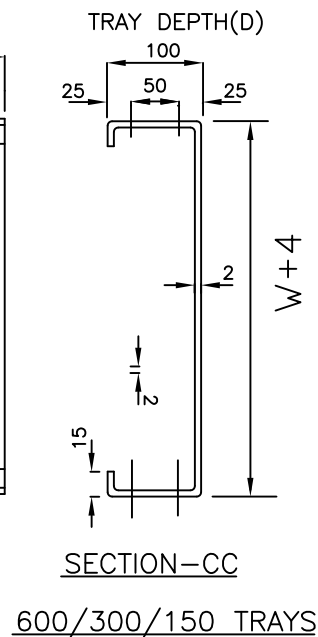
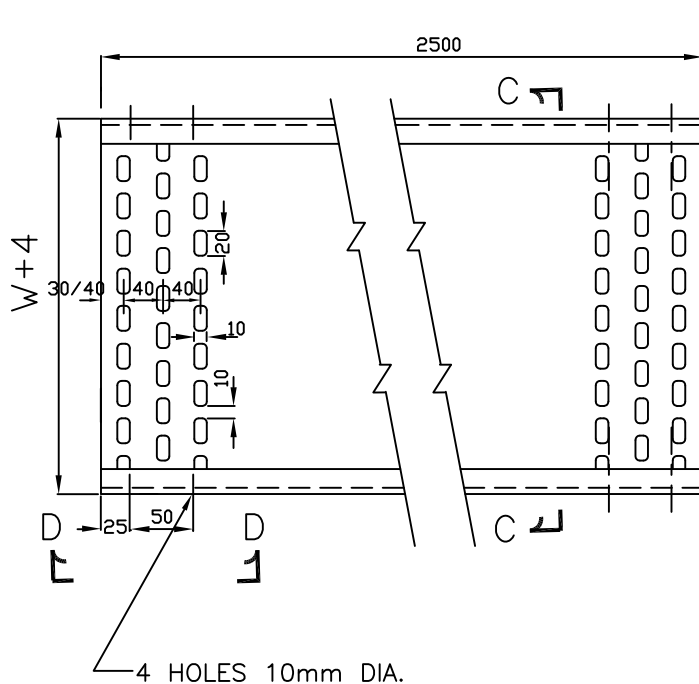


TYPICAL DETAILS OF CABLE TRAYS AND
ACCESSORIES (HOT DIP GALVANIZED)

DWG. NO.
PE-DG-RC-507-E005

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TRAY WIDTH W (mm)	600	300	150	100	50
TRAY DEPTH D (mm)	100	100	100	50	50

PERFORATED TYPE TRAY

FOR GENERAL NOTES, REFER SHEET 13 OF 13

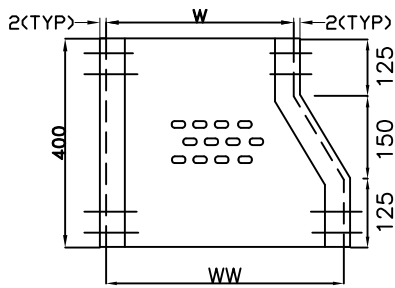


TYPICAL DETAILS OF CABLE TRAYS AND
ACCESSORIES (HOT DIP GALVANIZED)

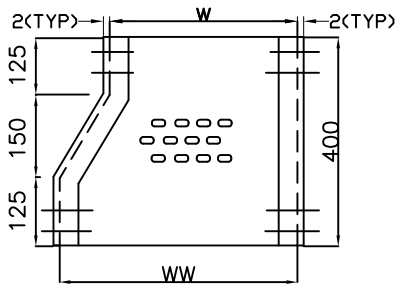
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PE-DG-RC-507-E005

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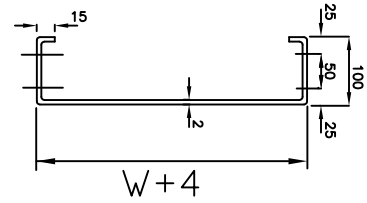
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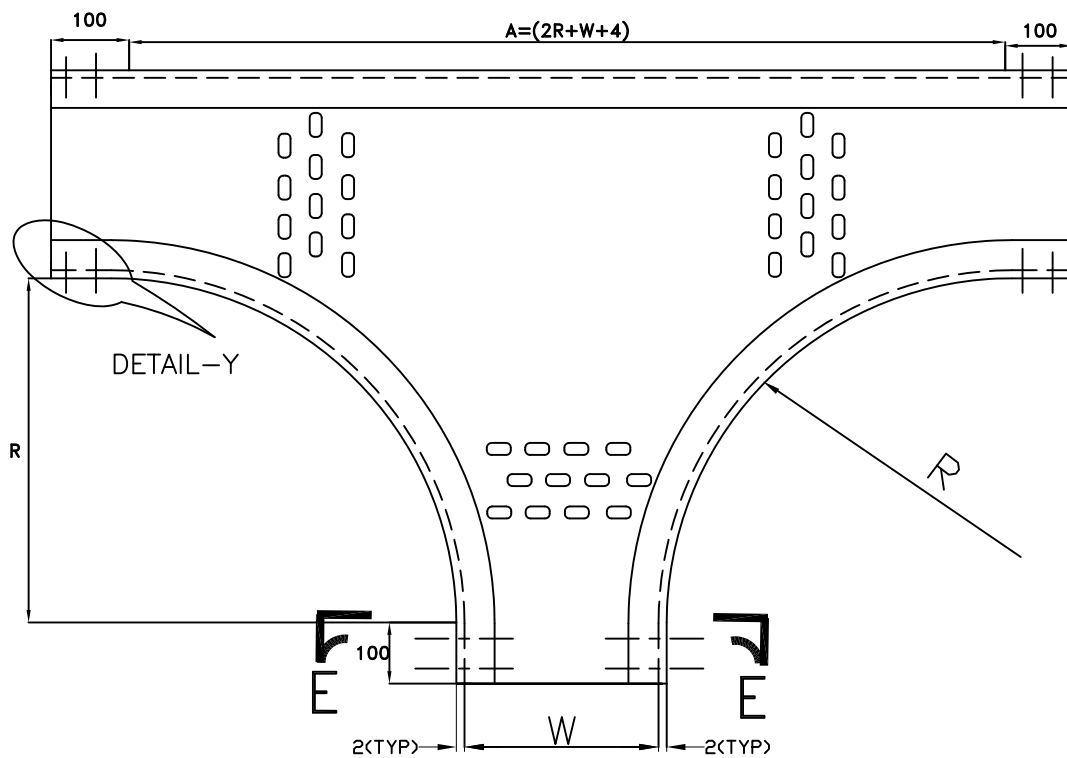
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PERFORATED TYPE

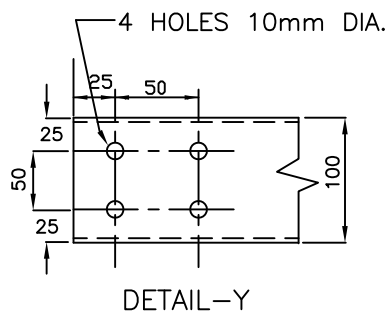
WW	W	DEPTH
600	300	100
600	150	100
300	150	100



SECTION-EE



HORIZONTAL TEE- PLAN



DETAIL-Y

WIDTH W	BENDING RADIUS R	DEPTH	A		
			W		
			150	300	600
150, 300 & 600	600	100	1354	1504	1804

PERFORATED TYPE

FOR GENERAL NOTES, REFER SHEET 13 OF 13

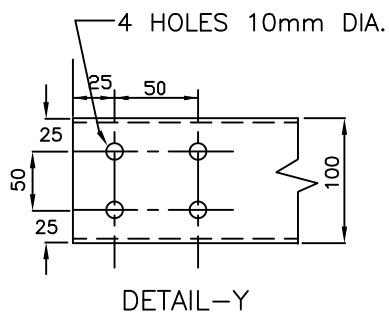
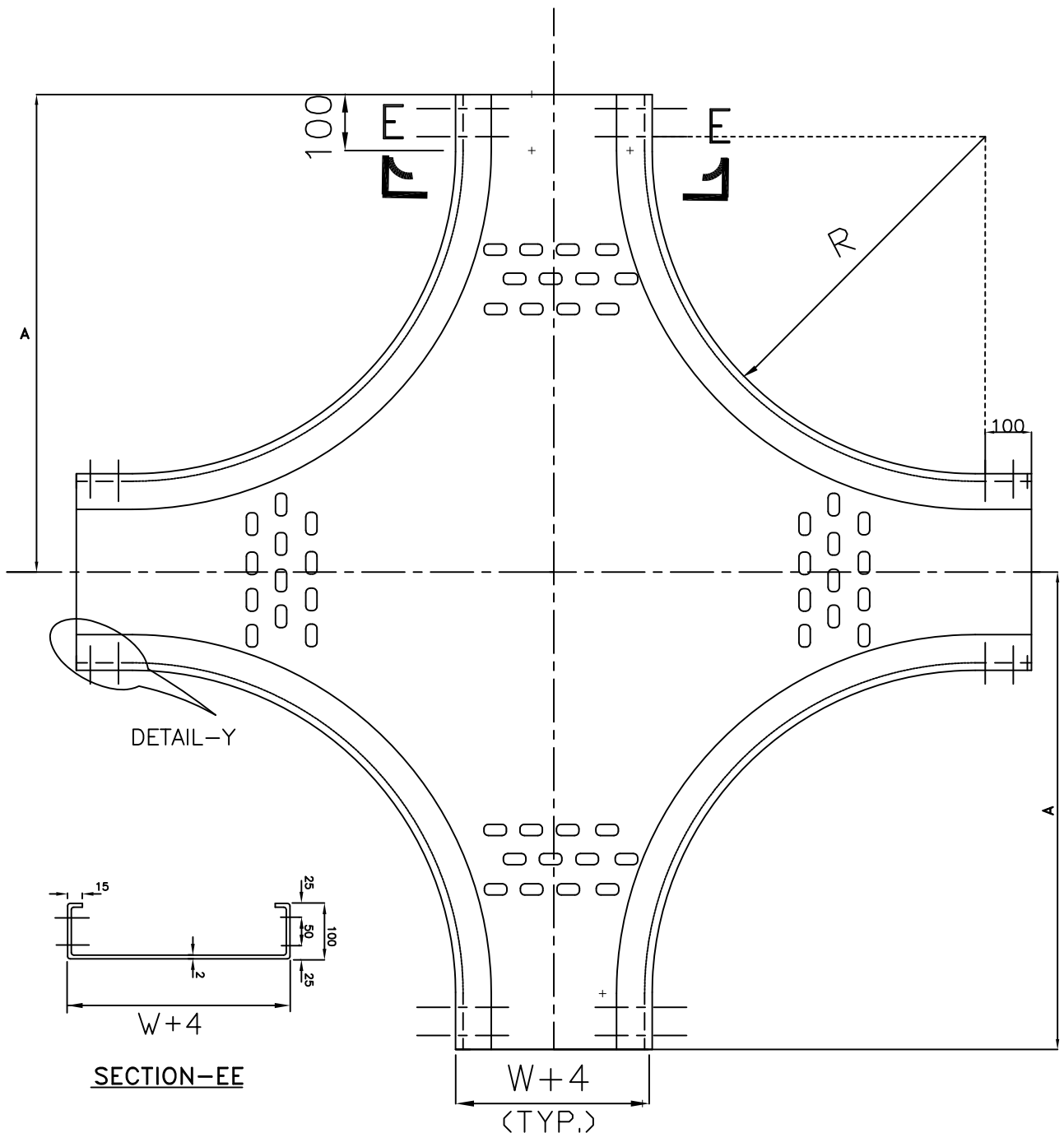


TYPICAL DETAILS OF CABLE TRAYS AND
ACCESSORIES (HOT DIP GALVANIZED)

DWG. NO.
PE-DG-RC-507-E005

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REV.0



WIDTH W	BENDING RADIUS R	$A=R+(W+4)/2+100$
600	600	1002
300	600	852

PERFORATED TYPE

FOR GENERAL NOTES, REFER SHEET 13 OF 13

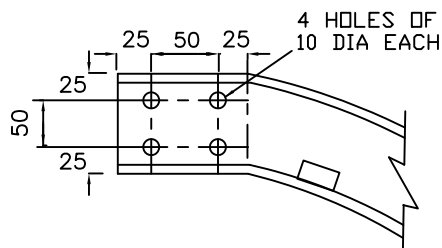
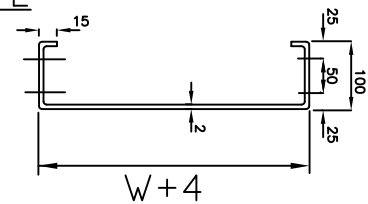
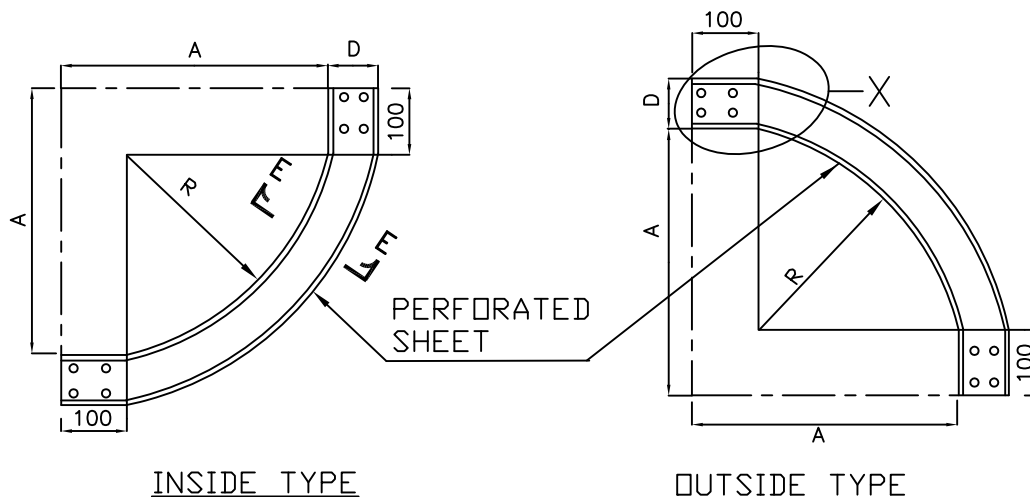


TYPICAL DETAILS OF CABLE TRAYS AND
ACCESSORIES (HOT DIP GALVANIZED)

DWG. NO.
PE-DG-RC-507-E005

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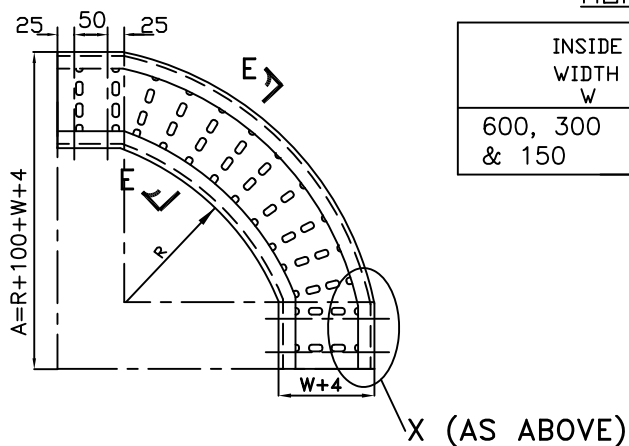


VERTICAL ELBOW 90 DEG UP/DOWN

INSIDE WIDTH W	BENDING RADIUS R	DEPTH	A
600, 300 & 150	600	100	700

90° VERTICAL BEND - PERFORATED TYPE

HORIZONTAL ELBOW 90 DEG



INSIDE WIDTH W	BENDING RADIUS R	DEPTH	A		
			150	300	600
600, 300 & 150	600	100	854	1004	1304

90° HORIZONTAL BEND - PERFORATED TYPE

FOR GENERAL NOTES, REFER SHEET 13 OF 13

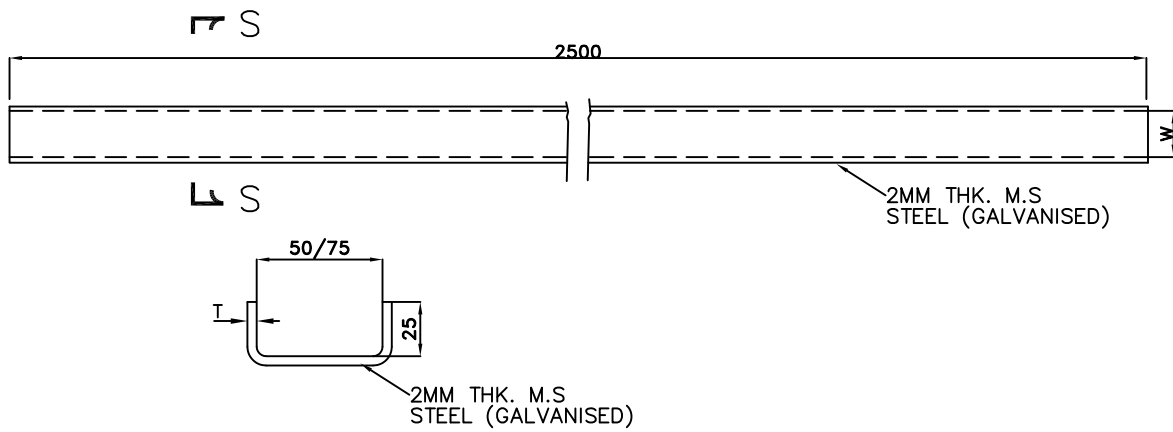


TYPICAL DETAILS OF CABLE TRAYS AND ACCESSORIES (HOT DIP GALVANIZED)

DWG. NO.
PE-DG-RC-507-E005

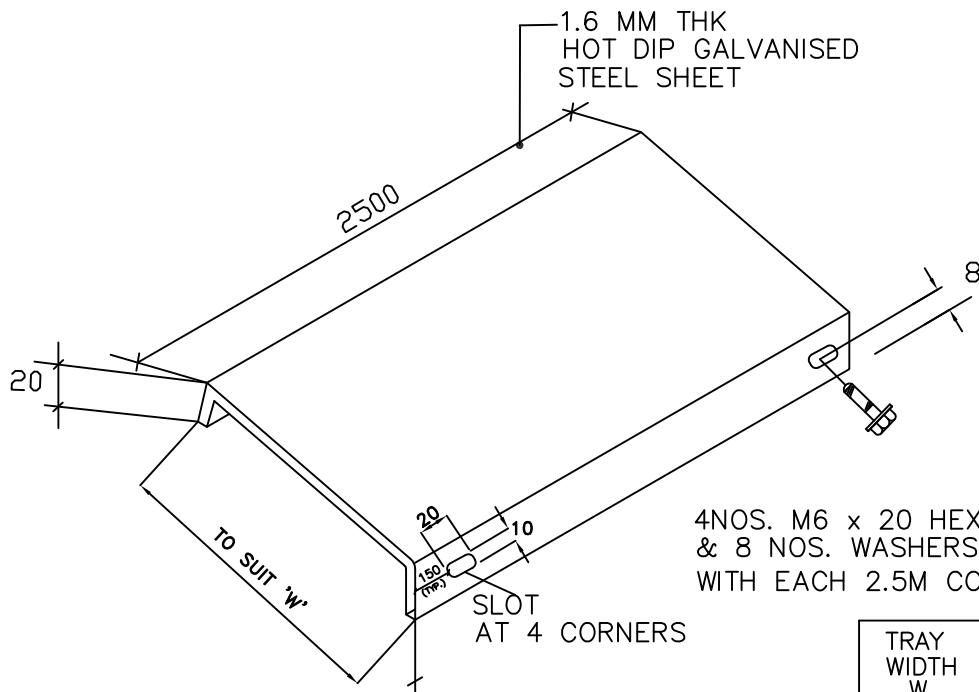
SHT. 11 of 13

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SECTION S-S

CABLE TROUGHS



4NOS. M6 x 20 HEX. BOLT, 4NOS. NUT & 8 NOS. WASHERS TO BE SUPPLIED WITH EACH 2.5M COVER SECTION.

TRAY WIDTH W	WIDTH OF TRAY COVER
50	56
100	106
150	156

CABLE TRAY COVER FOR 50, 100 & 150W TRAY

FOR GENERAL NOTES, REFER SHEET 13 of 13



TYPICAL DETAILS OF CABLE TRAYS AND ACCESSORIES (HOT DIP GALVANIZED)

DWG. NO.
PE-DG-RC-507-E005

SHT. 12 OF 13

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NOTES:-

1. THE CABLE TRAYS AND ACCESSORIES SHALL BE MADE OF 2mm HOT ROLLED M.S.SHEET CONFIRMING TO IS:1079. ALL THE COUPLER PLATE SHALL BE OF 3 MM THICK. THE CABLE TRAY COVER SHALL BE OF 1.6MM THICK MS SHEET AND CABLE TROUGH SHALL BE OF 2MM THICK MS SHEET.
2. THE CABLE TRAYS AND ACCESSORIES, COVER AND TROUGH SHALL BE HOT DIP GALVANISED AS PER IS 2629.THE MASS OF ZINC COATING SHALL BE 610 gm/sqm FOR 2MM THICK PRODUCT AND 460 gm/sqm FOR 1.6 MM THICK PRODUCT. THICKNESS SHALL BE 75 MICRONS (MINIMUM), 86 MICRONS (AVERAGE) FOR 2.0 MM THICK PRODUCT AND 55 MICRONS (MINIMUM), 65 MICRONS (AVERAGE) FOR 1.6 MM THICK PRODUCT .
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. THE DIMENSIONS OF ALL BENDS, TEES, CROSSES, ETC. FOR PERFORATED CABLE TRAYS SHALL BE SAME AS FOR LADDER TYPE TRAY FITTINGS.
6. SIDE CHANNELS OF PERFORATED TRAY ACCESSORIES SHALL BE WELDED WITH THE PERFORATED SHEET AT INTERVALS OF 100mm.
7. LENGTH OF WELDING SHALL NOT BE LESS THAN 25mm. WELDING SHALL BE AS PER IS 9595.
8. PREFERABLY SINGLE MS PERFORATED SHEET SHALL BE USED AS BASE OF ALL PERFORATED TYPE TRAY ACCESSORIES. HOWEVER, IF USE OF PIECES OF PERFORATED SHEET IS UNAVOIDABLE FOR BASE, PIECES SHALL BE WELDED WITH EACH OTHER IN LINE WITH THE ABOVE.
9. ALL TRAY CORNERS SHALL BE FREE OF SHARP EDGES & SMOOTH.
10. THE DEPTH, WIDTH AND LENGTH OF TRAYS AND ACCESSORIES SHALL BE WITHIN A TOLERANCE OF ± 2 MM.
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 FOR SIZES ABOVE 12MM AND ELECTROPLATED/ELECTROGALVANISED FROM SIZE BELOW 12MM.
13. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE.
14. TRAY ACCESSORIES SHOWN IN THIS DRAWING SHALL BE FACTORY FABRICATED, FOR USE AT AT SITE AS PER APPROVED LAYOUT DRAWINGS. FURTHER FOR SPECIFIC SITE REQUIREMENTS (EG. IRREGULAR ANGLE BENDS SUCH AS 30°/60° BENDS, ETC) AS PER SITE LAYOUT CONDITIONS, TRAY ACCESSORIES SHALL BE FABRICATED AT SITE FROM THE STRAIGHT LENGTH OF RESPECTIVE SIZES AS REQUIRED. GALVANIZATION DAMAGED DURING CUTTING/WELDING OPERATIONS SHALL BE BRUSHED AND RED LEAD PRIMER, OIL PRIMER AND ALUMINIUM PAINT SHALL BE APPLIED BEFORE INSTALLATION OF THE ACCESSORIES.
15. WIDTH (INSIDE) OF CABLE TRAYS PROPOSED TO BE USED FOR PROJECT ARE AS UNDER :
LADDER TYPE CABLE TRAY (MM) : 600, 300 & 150.
PERFORATED TYPE CABLE TRAY (MM) : 600, 300, 150, 100 & 50.
16. WIDTH (INSIDE) OF CABLE TROUGHS SHALL BE 50MM & 75MM.



TYPICAL DETAILS OF CABLE TRAYS AND
ACCESSORIES (HOT DIP GALVANIZED)

DWG. NO.
PE-DG-RC-507-E005

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**STANDARD TECHNICAL SPECIFICATION
FOR CABLE TRAY & ACCESSORIES**

SPECIFICATION NO. PE-RC-999-507-E021

VOLUME II

SECTION II

REVISION 00

DATE: 26.02.2025

SECTION-II

STANDARD TECHNICAL REQUIREMENTS



TECHNICAL SPECIFICATION FOR CABLE TRAY & ACCESSORIES

SPECIFICATION NO. **PE-RC-999-507-E021**

VOLUME II

SECTION II

REVISION 01

DATE: **26.02.2025**

SHEET 1 of 2

1.0 SCOPE OF ENQUIRY

- 1.1 This specification covers the design, manufacture, assembly, testing and inspection at vendor's/sub vendor's works, packing and despatch to site of **CABLE TRAYS & ACCESSORIES** as described in various sections of this specification.

2.0 CODES & STANDARDS

- 2.1 The material, constructional features and various processes involved in manufacture shall comply with latest revision of relevant Indian Standards.
- 2.2 The design, material, construction, manufacture, inspection, testing and performance of Cable Trays & Accessories shall conform to the latest revision of relevant standards and codes of practices mentioned in Data Sheet - A.
- 2.3 In case of conflict between the applicable reference standard and this specification, this specification shall govern.

3.0 DESIGN REQUIREMENTS AND CONSTRUCTIONAL FEATURES

- 3.1 All items listed in the BOQ –Cum-Price Schedule for Cable Trays & Accessories (**Attached with NIT**) shall be manufactured as per Datasheet-A and project drawings enclosed with this specification. Minor fabrication detail changes which do not affect the material / dimensional aspect of the equipment, shall be to BHEL / owner's approval without any commercial implications.

3.2 **Cable Trays & Accessories, Tray Covers and Fittings:**

- 3.2.1 Cable trays & accessories shall be of two types, namely ladder type and perforated type as specified in Data Sheet-A and drawings enclosed with this specification.
- 3.2.2 Coupler plates shall be provided for connecting tray ends to other straight trays, horizontal elbows, vertical elbows, tees, cross, reducers etc. The number of coupler plates, washers, nuts & bolts to be supplied shall be as per Data Sheet-A.
- 3.2.3 Necessary fasteners shall be provided along with each length of cable tray as specified in drawings enclosed.
- 3.2.4 The width of the tray covers (where provided) shall be suitable for the width of trays. Suitable bolting arrangement shall be supplied for attaching the cover to the cable trays, elbows, reducers, tees etc. as per the drawing enclosed.
- 3.2.5 All welded joints shall be smooth enough to provide a good appearance and shall not cause any injury to working personnel or any damage to the cable laid directly on it. All welding work shall be done by skilled personnel.

4.0 QUALITY/INSPECTION

- 4.1 NTPC's Standard QP (QP NO. 0000-999-QOE-S-021, Rev-01) is enclosed for reference. However, at contract stage, the successful bidder shall submit the QP for BHEL/ ultimate customer's approval. In case bidder has reference QP agreed with ultimate customer, same can be submitted for specific project after award of contract for BHEL/ultimate customer's approval. There shall be no commercial implication to BHEL on account of QP approval.



TECHNICAL SPECIFICATION FOR CABLE TRAY & ACCESSORIES

SPECIFICATION NO. **PE-RC-999-507-E021**

VOLUME II

SECTION II

REVISION 01

DATE: **26.02.2025**

SHEET 2 of 2

- 4.2 All materials shall be procured, manufactured, inspected and tested by vendor/ sub-vendor as per approved quality plan.
- 4.3 The supplier shall perform all tests necessary to ensure that the material and workmanship conform to the relevant standards and comply with the requirements of the specification. Charges for all these tests for all the equipment & components shall be deemed to be included in the bid price.
- 4.4 Load Test: -

One piece each of 2.5m length of cable tray of 300mm & above shall be taken as sample from each offered lot. It shall be supported at both end & loaded with uniform load of 76 kg/mete along the length of cable tray. The maximum deflection at the mid-span of each size shall not exceed 7mm

5.0 PACKING

The material shall be packed to ensure protection against damage during transit, storage for prolonged periods and handling. Refer Annexure-B to Quality Plan for packing requirement.

6.0 DELIVERY


The delivery shall be as per NIT (Notice Inviting Tender).

7.0 DOCUMENTATION

- 7.1 Documents to be submitted by the bidder along with the bid.

- A copy of sheet "Compliance Sheet" with bidder's signature & company stamp.
- Un-priced copy of "BOQ Cum Price Schedule attached with NIT" with bidder's signature & company stamp indicating "quoted" against each line item.
- A copy of sheet "No Deviation Sheet" with bidder's signature & company stamp.
- Supporting documents of PQR.

No other documentation is required to be submitted as technical offer. Any information contained in other parts of the offer (e.g. covering letter, annexures, etc.) which is deviating from specification requirements in any way shall not be considered by BHEL as part of offer.

<div></div> <div>ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC.) : मद (सामग्री, वर्ग, ग्रेड, रैंटिंग, रेंज, आकार आदि): GALVANIZED CABLE TRAYS (PERFORATED & LADDER TYPE) & ACCESSORIES</div>		STANDARD QUALITY PLAN स्टैण्डर्ड क्वालिटी प्लान				QP NO / क्यूपी सं.:		0000-999-QOE- S-021		REVIEWED BY: द्वारा समीक्षा की गई:			APPROVED BY: द्वारा अनुमोदित:			
						CONFORMING TO CODE: कोड के अनुरूप: IS/IEC/NTPC TECHNICAL SPECIFICATION				REV NO / संशोधित सं.:		01		S. N. TRIPATHI SHAKTI NATH TRIPATHI S. S. MISHRA SUDHANSHU SEKHAR MISHRA Digitally signed by SUNIL KUMAR LAL Date: 2022.09.01 19:15:52 +05'30'		
										DATE/ तिथि		30.08.2022				
										PAGE// पृष्ठ		Page 1 of 2				
S.K. LAL		SUNIL KUMAR LAL														
SL. NO क्र.सं.	COMPONENT & OPERATIONS अवयव व संचालन	CHARACTERISTICS / विशेषताएं	CLASS वर्ग	TYPE OF CHECK जांच के प्रकार	QUANTUM OF CHECK जांच के परिमाण M एम C/ N सी/एन		REFERENCE DOCUMENT संदर्भ दस्तावेज#	ACCEPTANCE NORMS/ स्वीकृत मानदंड	FORMAT OF RECORD/ रिकॉर्ड का प्रारूप		AGENCY/ एजेंसी M C N			REMARKS/टिप्पणियां		
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10			11		
1.	FINISHED CABLE TRAYS & ACCESSORIES	1.In Black Condition a) Weld Quality b) Burs 2. After Galvanizing 2.1 General Physical inspection including Galvanizing Quality/ Defects, Dicromating, White rusting etc. 2.2 Dimensional check & Sheet Thickness 2.3 Galvanising tests a) Coating thickness measurement survey by ELcometer b) Mass of zinc coating	Major Major Major Major Critical	Visual Visual Visual Measure ment Measure ment Measure ment	100% Random IS-4759-1996 -do- -do- -do- -do-	Random - 5 Sample/ lot -do- -do- 1 coupon sample of	Manufacturer's Plant Std - IS-2629-1985 IS-4759-1996 NTPC/Main Supplier Approved Drg. IS-4759-1996 IS-3203-1982 IS-6745-1996 IS-3203-1982	Manufacturer's Plant Std No Burs IS-2629-1985 IS-4759-1996 NTPC/Main Supplier Approved Drg. IS-4759-1996 Table-1 IS-4759-1996 Table-1	Inspection Report -do- -do- -do- -do-	P P P P P	- - W W W W	- - W W W W	A)The cable Trays shall be galvanized at NTPC approved source only. B) The supplier to ensure procurement of steel from main producers like SAIL/ TISCO / Rastriya Ispat/Ispat Ind./ Jindal/ Esser/Lloyds /HS Co. and Zinc from Hindustan Zinc Ltd. C)Welding shall be done by qualified welders as per supplier system D) Pre-treatment of fabricated cable trays shall be carried out in seven tank process as per IS 2629. All the parameters e.g. concentration, tempera- ture, density etc. to be maintained and			

LEGEND:/ संकेतिका: * RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION./ * "टिक" (.) के साथ प्रमाणित रिकॉर्ड, क्यूए दस्तावेजीकरण में आपूर्तिकर्ता द्वारा अनिवार्य रूप से शामिल किया जाएगा।


** M: MANUFACTURER / SUB-SUPPLIER /निर्माता / उप-आपूर्तिकर्ता C: MAIN CONTRACTOR / मुख्य संविदाकार, N: NTPC/ एनटीपीसी P: PERFORM/ निष्पादन W: WITNESS/ गवाह AND V: VERIFICATION. AS APPROPRIATE/ सत्यापन (जैसा उपयुक्त हो), CHP/ सीएचपी: NTPC SHALL IDENTIFY IN COLUM "N" AS "W".: एनटीपीसी खंड "N" में "W" के रूप में करेगा।

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 ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC.): मद (सामग्री, वर्ग, ग्रेड, रैंटिंग, रेंज, आकार आदि): GALVANIZED CABLE TRAYS (PERFORATED & LADDER TYPE) & ACCESSORIES		STANDARD QUALITY PLAN स्टैण्डर्ड क्वालिटी प्लान				QP NO / क्यूपी सं.:	0000-999-QOE- S-021	REVIEWED BY: द्वारा समीक्षा की गई:			APPROVED BY: द्वारा अनुमोदित:		
		CONFORMING TO CODE: कोड के अनुरूप: IS/IEC/NTPC TECHNICAL SPECIFICATION				REV NO / संशोधित सं.:	01	S. N. TRIPATHI SHAKTI NATH TRIPATHI			S. S. MISHRA		
						DATE/ तिथि	30.08.2022	S.K. LAL SUNIL KUMAR LAL <small>Digitally signed by SUNIL KUMAR LAL Date: 2022.09.01 19:16:34 +05'30'</small>			SUDHANS HU SEKHAR MISHRA <small>Digitally signed by SUDHANS HU Date: 2022.09.01 13:22:49 +05'30'</small>		
						PAGE// पृष्ठ	Page 2 of 2						
SL. NO क्र.सं.	COMPONENT & OPERATIONS अवयव व संचालन	CHARACTERISTICS / विशेषताएं	CLASS वर्ग	TYPE OF CHECK जांच के प्रकार	QUANTUM OF CHECK जांच के परिमाण		REFERENCE DOCUMENT संदर्भ दस्तावेज#	ACCEPTANCE NORMS/ स्वीकृत मानदंड	FORMAT OF RECORD/ रिकॉर्ड का प्रारूप	AGENCY/ एजेंसी	REMARKS/टिप्पणियां		
					M एम	C/N सी/एन							
1.	2.	3.	4.	5.	6.		7.	8.	9.	D*	** 10		
		c) Uniformity of zinc coating/dip test	Critical	Measure ment	-do-	each thickness -do-	IS-2629-1996 IS-2633-1986 IS-4759-1996	IS-4759-1996 Cl. 9.3	-do-	P	W	W	recorded by the Galvanizer.
		d) Adhesion test	Critical	Visual	-do-	-do-	IS-2629-1985	IS-2629-1985	-do-	P	W	W	E)The process of pretreatment be verified by NTPC on surveillance basis during Inspection of cable trays.
		2.4 Deflection Test	Critical	Measure ment	1 Sample from each size type/lot	1 Sample from each size type/lot	*F*	*F*	-do-	P	W	W	*F*) One piece each of 2.5 meter size of cable tray of 300 mm & above shall be taken as sample from each offered lot for inspection. It shall supported at both ends & loads uniformly distributed load of 76 Kg/ meter along the length of cable. The maximum deflection at of each sample shall not exceed 7 mm.

LEGEND:/ संकेतिका: * RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION./ * "टिक" (✓) के साथ प्रमाणित रिकॉर्ड, क्यूए दस्तावेजीकरण में आपूर्तिकर्ता द्वारा अनिवार्य रूप से शामिल किया जाएगा।

** M: MANUFACTURER / SUB-SUPPLIER /निर्माता / उप-आपूर्तिकर्ता C: MAIN CONTRACTOR / मुख्य संविदाकार, N: NTPC/ एनटीपीसी P: PERFORM/ निष्पादन W: WITNESS/ गवाह AND V: VERIFICATION. AS APPROPRIATE/ सत्यापन (जैसा उपयुक्त हो), CHP/ सीएचपी: NTPC SHALL IDENTIFY IN COLUM "N" AS "W". एनटीपीसी खंड "N" में "W" के रूप में करेगा।


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	TECHNICAL SPECIFICATION FOR CABLE TRAYS & ACCESSORIES	Specification No.: PE-RC-999-507-E021
		Rev. No. 00
		Date : 26.02.2025
	Annexure-A of Quality plan	
List of NTPC approved Galvanizers		

S.N.	vendor name
1	M/s Sigma Galvanising Pvt. Ltd., Mumbai
2	M/s B.P. Projects , Kolkata
3	M/s Shivam Engineers & Fabricators , Ghaziabad
4	M/s B.G. Shirke, Pune
5	M/s Neha Galvaniser,Kolkata
6	M/s Ratan Projects & Engineering Co. Pvt. Ltd.,Howrah
7	M/s M J Engg,Delhi
8	M/s A.V. Engg, Kolkata
9	M/s Inar Profiles, Vishakapatnam
10	M/s Anand Udyog, Mumbai
11	M/s Techno Engg,Chandigarh
12	M/S Steelite Engg, Mumbai
13	M/s National Galvanizer, Kolkata
14	M/s Unistar Galvanizer, Kolkata
15	M/s Bajaj Pune
16	M/s Electrocare Industries, Mumbai
17	M/s Gurpreet Galvanizer, Hyderabad
18	M/s Radhakrishnan Shetty, Chennai
19	M/s Karamtara, Mumbai
20	M/s Poona Galvanizers, Pune
21	M/s Unitech Fabricators & Galvanizers- Hoogly

NOTES:
1. ANY CHANGE IN THE ABOVE LIST SHALL BE INFORMED 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 FROM THE ABOVE LIST. APART FROM GALVANIZERS AS MENTIONED ABOVE , VENDOR MAY PROPOSE HIS OWN GALVANIZER WHICH SHALL BE SUBJECT TO NTPC/BHEL APPROVAL. IN CASE OF NON APPROVAL OF VENDOR PROPOSED GALVANIZER , GALVANIZATION SHALL BE DONE FORM LIST OF GALVANIZER AS MENTIONED ABOVE WITHOUT ANY TECHNO-COMMERCIAL IMPLICATION TO BHEL.



TECHNICAL SPECIFICATION FOR CABLE TRAYS & ACCESSORIES

SPECIFICATION NO. PE-RC-999-507-E021

VOLUME II

ANNEXURE-B

REVISION 00

DATE: 26.02.2025

SHEET 1 of 1

ANNEXURE-B to Quality Plan PACKING REQUIREMENT

Sl.no	DESCRIPTION
1	Type of Packing:
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 stacked.
1.3	At bottom of each stack wooden block shall be provided. Trays and accessories in each stack shall be tied 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 coupler plates shall be tied together with wire rope and number of such sets shall be placed in wooden box.
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	Quality of wood:
2.1	Quality of wood: 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	Cushioning material and moisture absorber:
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	Packing slip & holder:
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





Price Variation Formulae

ANNEXURE-C

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)/MM/YYYY) 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-C

Notes:

- (a) All prices of raw materials are exclusive of any taxes.
- (b) All prices are as on first working day of the month.
- (c) PVC ceiling limit shall be positive (+ve) 20% of Ex-works price and negative (-ve) unlimited.