

**TELANGANA STATE POWER GENERATION
CORPORATION LIMITED**

5X800MW YADADRI TPS

VOLUME – II

**TECHNICAL SPECIFICATION
FOR
*GALVANISED
CABLE TRAY SUPPORT SYSTEM
(WELDED TYPE)***

SPECIFICATION NO : *PE-TS-417-507-E012, R0*



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, UP (INDIA) – 201301**



**TECHNICAL SPECIFICATION
FOR
GALVANISED
CABLE TRAY SUPPORT SYSTEM
(WELDED TYPE)**

SPECIFICATION NO. PE-TS- 417-507-IE012

VOLUME II

SECTION I

REVISION 0

DATE: 02.07.2018

SHEET 1 OF 1

CONTENTS

S. NO	DESCRIPTION	NO. OF SHEETS
1.0	SPECIFICATION No.	01
2.0	CONTENTS	01
3.0	COMPLIANCE CERTIFICATE	01
4.0	SECTION – 'I'	
4.1	SPECIFIC TECHNICAL REQUIREMENTS	02
4.2	ANNEXURE-A (LIST OF DRAWINGS /DOCUMENTS TO BE SUBMITTED BY SUCCESSFUL BIDDER)	01
4.3	STANDARD QUALITY PLAN	05
5.0	SECTION- 'II'	
5.1	STANDARD TECHNICAL SPECIFICATION	03
5.2	TECHNICAL DATA SHEET-A	01
	TOTAL NO. OF SHEETS	= 15



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VOLUME-II

COMPLIANCE CERTIFICATE

REVISION 00

DATE: 02.07.2018

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 other than those furnished in the 'schedule of deviations'
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' of the specification shall not be considered (i.e., technical description & quantities as per the specification shall prevail).

BIDDER'S STAMP & SIGNATURE



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VOLUME II

SECTION I

REVISION 0

DATE: 02.07.2018

SHEET 1 OF 2

SECTION – I

SPECIFIC TECHNICAL REQUIREMENTS

	TECHNICAL SPECIFICATION FOR GALVANISED CABLE TRAY SUPPORT SYSTEM (WELDED TYPE)	SPECIFICATION NO. PE-TS-417-507-E012	
		VOLUME II	
		SECTION I	
		REVISION 0	DATE: 02.07.2018
		SHEET 2 OF 2	

1.0 **SCOPE OF ENQUIRY**

- 1.1 This enquiry covers the supply of **Cable tray support system (Welded type)** conforming to this specification.
- 1.2 General technical requirements of Cable tray support system (Welded type) Materials are indicated in Section-I. Project specific technical/ quality requirements / changes are listed in Section-II & Data Sheet-A.
- 1.3 The stipulations of Section-I, followed by those of Data Sheet – A shall prevail in case of any conflict between the stipulations of Section-I, Data sheet – A & Section-II.

2.0 **BILL OF QUANTITIES:**

- 2.1 Quantity requirements shall be as per **Annexure-I (Bill of Quantities (BOQ))** of NIT.

3.0 **SPECIFIC REQUIREMENTS:**

3.1 Technical:

S. No.	Reference clause No. of Section II (if any)	Specific Requirement/ Change
1	Clause no. 4.1	Quality plan number shall be read as PE-QP-999-507-E006 instead of PED-507-00-Q-007/02

3.2 Quality/ Inspection:

S. No.	Reference clause No. of Section II (if any)	Specific Requirement/ Change

	TECHNICAL SPECIFICATION FOR GALVANISED CABLE TRAY SUPPORT SYSTEM (WELDED TYPE)	SPECIFICATION NO. PE-TS-417-507-E012	
		VOLUME I I	
		SECTION -I	
		REVISION 0	DATE: 02.07.2018
		SHEET	1 OF 1

ANNEXURE – A

**LIST OF DRAWINGS / DOCUMENTS
(REQUIRED TO BE FURNISHED BY SUCCESSFUL BIDDER AFTER AWARD OF CONTRACT)**

Sl. No.	Drawings/Document Description	Drawings / Document Number	Submission Schedule
1.	Quality Plan for cable tray support material (Welded Type)	PE-V0-417-507-E907	Within one week of award of contract
2.	Datasheet for cable tray support material (Welded Type)	PE-V0-417-507-E071	Within one week of award of contract

Note:-

It may please be noted that successful bidder is not to make any fresh submittals at contract stage w.r.t. above mentioned drawings/documents. Standard Quality Plan and Datasheet-A as enclosed in the technical specification are to be appended with cover sheet bearing drawing/document number & description as stated above. The signed & stamped copy for the same shall be submitted by successful bidder to BHEL within one week of award of contract without making any changes in the contents of the drawing/document.



DOCUMENT TITLE

**TECHNICAL SPECIFICATION FOR
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SPECIFICATION NO. **PE-TS-417-507-E012**

VOLUME II -

SECTION -I

REVISION 0

DATE: 02.07.2018

SHEET 1 OF 3

**STANDARD
QUALITY PLAN**

 QUALITY PLAN		CUSTOMER : TSPGCL		PROJECT TITLE 5X800MW YADADRI TPS		SPECIFICATION NO. PE-TS-417-507-E012						
		BIDDER/ VENDOR :		PROJECT STANDARD QP NO. : PE-QP-999-507-E006, REV. 0		SPECIFICATION TITLE: TECHNICAL SPECIFICATION FOR GALVANISE CABLE TRAY SUPPORT SYSTEM(WELDED TYPE)						
		SHEET 1 OF2		ITEM : CABLE TRAY SUPPORT MATERIAL (WELDED TYPE)								
SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS
									P	W	V	
1	2	3	4	5	6	7	8	9	10			11
1.0	RAW MATERIAL											
1.1	MILD STEEL SECTIONS (CHANNEL & ANGLES)AS PER SPECIFICATION	1.CHEMICAL & PHY. PROPERTIES	MA	VERIFICATION OF TC'S	100%	IS -2062	IS -2062	MILL TC	3	-	1/2	Steel shall be procured from SAIL/ISSCORIN/BHUSAN/JINDAL STEEL/JINDISPAT/ESSAR/LLOYD/ IISCO/ authorised SAIL Re Rollers.
1.2	ZINC	2.DIMENSIONS	MA	MEASUREMENT	100%	IS - 808/ IS - 1852	IS - 808/ IS - 1852	QC RECORD	3/2	-	-	
2.0	IN-PROCESS	3.SURFACE FINISH	MA	VISUAL	100%	IS:2062	IS:2062	QC RECORD	3/2	-	-	
2.1	CUTTING	CHEM COMP.	MA	CHEM. TEST	EACH HEAT	IS-209	IS-209	QC RECORD	3/2	-	1/2	
		1.DIMENSIONS	MA	MEASUREMENT	100%	APP. DATA SHEET	APP. DATA SHEET	QC RECORD	2	-	1	
		2. WELDING QUALITY (IF APPLICABLE)	MA	VISUAL	100%	GOOD WELDING PRACTICE	FREE FROM DEFECTS & SLAG	QC RECORD	2	-	1	
2.2	SURFACE PREPARATION	3.SURFACE FINISH	MA	VISUAL	100%	FREE FROM DEFECTS & SLAG	FREE FROM DEFECTS & SLAG	QC RECORD	2	-	1	
		1.CLEANING, PICKLING, RINSING & FLUXING	MA	VISUAL	PERIODIC IN EACH SHIFT	IS:2629	IS:2629	QC RECORD	2	-	-	
		2. SURFACE QUALITY	MA	VISUAL	100%	IS-2629	IS-2629	QC RECORD	2	-	-	
2.3	GALVANISING	1.TEMPERATURE OF BATH	MA	TEMPERATURE INDICATOR	CONTINUOUS	IS-2629	IS-2629	QC RECORD	3/2	-	-	If vendor doesn't have his own galvanizing plant duly approved by BHEL PEM; then galvanizing shall be carried out at BHEL-PEM approved other galvanizing plants as per Annexure-2.
BHEL												
PARTICULARS												
NAME												
SIGNATURE												
DATE												
BIDDER/VENDOR												
BIDDER'S/VENDORS COMPANY SEAL												
LEGEND : 1 - BHEL/ CUSTOMER 2 - VENDOR 3 - SUB-VENDOR P - PERFORM W - WITNESS V - VERIFICATION												

		QUALITY PLAN		CUSTOMER : TSPGCL		PROJECT TITLE : 5X800MW YADADRI TPS PROJECT		SPECIFICATION NO. PE-TS-417-507-E012			
		BIDDER/ VENDOR		BIDDER/ VENDOR		STANDARD QP NO. : PE-QP-999-507-E006, REV. 0		SPECIFICATION TITLE: TECHNICAL SPECIFICATION FOR GALVANISED CABLE TRAY SUPPORT SYSTEM(WELDED TYPE)			
		SYSTEM		CABLING		ITEM : CABLE TRAY SUPPORT MATERIAL (WELDED TYPE)					
SHEET 2 OF 2											
SL. NO.	COMPONENT/OPERATION	CHARACTERISTIC CHECK	CAT.	TYPE/ METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY	REMARKS	
1	2	3	4	5	6	7	8	9	10	11	
3.0	FINISHED ITEMS	2. DROSS	MA	VISUAL	PERIODIC	IS - 2629	IS - 2629	QC RECORD	3/2	-	
		3. RATE OF IMMERSION	MA	VISUAL MEASUREMENT	100%	IS - 2629 / MFR'S PRACTICE	IS - 2629 / MFR'S PRACTICE	QC RECORD	3/2	-	
		4. SURFACE QUALITY	MA	VISUAL	100%	IS - 2629	FREE FROM BURRS, SLAG, FLUX, STAIN, ETC.	QC RECORD	3/2	-	
		1. DIMENSIONS	MA	MEASUREMENT	IS 2500 (PART 1) LEVEL S-4	APP. DATA SHEET	APP. DATA SHEET	INSP. REPORT	2	1	-
		2. SURFACE FINISH	MA	VISUAL	IS 2500 (PART 1) LEVEL S-4	FREE FROM BURRS, SLAG, FLUX, STAIN, ETC.	FREE FROM BURRS, SLAG, FLUX, STAIN, ETC.	INSP. REPORT	2	1	-
		3.MASS OF ZINC COATING	MA	CHEM. TEST	IS - 4759	IS-6745 / APP. DATA SHEET	APP. DATA SHEET	INSP. REPORT	2	1	-
		4.UNIFORMITY OF ZINC COATING	MA	CHEM. TEST	IS - 4759	IS-2633	IS-2633	INSP. REPORT	2	1	-
		5.THICKNESS OF ZINC COATING	MA	ELCOMETER	IS - 4759	APP. DATA SHEET	APP. DATA SHEET	INSP. REPORT	2	1	-
		6.ADHESION	MA	MECH.TEST	IS-4759	IS-2629	IS-2629	INSP. REPORT	2	1	-
BHEL		PARTICULARS		BIDDER/VENDOR							
		NAME									
		SIGNATURE									
		DATE									
LEGEND :		1 - BHEL/ CUSTOMER	2 - VENDOR	3 - SUB- VENDOR	P - PERFORM	W - WITNESS	BIDDER'S/ VENDORS COMPANY SEAL		V - VERIFICATION		

ANNEXURE-1

INSTRUCTIONS FOR QUALITY PLAN

The Quality Plan shall include all the Quality Control Measures and Checks adopted by the Vendor to ensure that the material/component/assembly/services supplied by him meet/will meet the requirements as per specifications and good practices. They shall include all stages of operation such as materials, processes, manufacture, assembly, packing and despatch. The following guide lines may be noted:

Column 1-	Serial Number
Column 2-	Component/Operation- The component and/or operation being checked shall be given here.
Column 3-	Characteristics check- The characteristics being checked shall be given here, e.g., chemical composition, mechanical properties, leak tightness, surface defects etc..
Column 4-	Category - 'CR' stands for critical characteristic - affecting safety of equipment and personnel 'MA' stands for major Characteristic - affecting safety of equipment and personnel 'MI' stands for minor characteristic - affecting appearance etc.
Column 5-	Type/Method of check e.g. chemical analysis tensile testing, hydraulic test, visual examination radiography etc.
Column 6-	Extent of check, such as, 100, 10, 1 percent etc.
Column 7-	Reference Documents - Documents, such as technical specification, drawings, standard specifications (IS, BS ETC.) procedure, etc. according to which check is done.
Column 8-	Acceptance Norms - Standards etc. according to which acceptability or otherwise of the characteristics being checked is decided.
Column 9-	Format of Record - Formats, log shets, reports, etc. in which the observations are recorded. Standard log sheets, reports, formats etc. of the Vendors shall be numbered and such reference numbers shall be included here.
Column 10-	Agency - The agency which performs the test/instruction shall be written in sub-column 'W' The agency which verifies test certificates/inspection records and carries out audit check of the components/operation shall be written in sub-column 'V' The agencies are codified as 1,2 & 3 '1' stands for (BHEL) '1' * means the operation shall be cleared by BHEL before the start of the next operation. '2' Stands for Vendor '3' stands for sub-Vendor of the Vendor and so on.
Example :	
Entry	'3' in column 'P' means test./inspection to be performed by sub-Vendor's QC
Entry	'2' in column 'W' means test./inspection to be witnessed by Vendor's QC
Entry	'1' in column 'V' means verification shall be done by BHEL and next stage to be started only after the hold point is cleared by BHEL
Column11-	Remarks - Any special remarks shall be given here.

NOTES :

1. In absence of correlation with the test certificate(s) (e.g. material identification) samples shall be drawn bgy BHEL and all tests as per relevent specifications shall be carried out in their presence or in recognized Government Laboratory.
2. When materials and components are initially identified and stamped by BHEL QS engineer, the identification marks shall be presserved till despatch. Wherever this is not possible, the identification mark shall be transferred to the components in the presence of BHEL QS Engineer unless other wise agreed.
3. For castings and forgings integral test specimens shall be provided, When this is not possible for casting, they shall be poured in the presence of BHEL QS Engineer unless otherwise, if witnessing of test by BHEL is called for.
4. When welders qualified by reputed inspection agencies or statutory bodies are not available, qualification tests shall be conducted in the presence of BHEL QS Engineer.
5. This Quality Plan is liable to be modified as per the requirements of approved drawings and changes in technical specifications/drawings. If there are contradictions in respect of column 7 & 8 between this Quality Plan and the approved drawings specifications, the latter shall prevail.
6. Wherever inspection by BHELs Purchaser/Third Party/Statutory authorities are mandatory, this shall be compiled with.
7. Inspection reports, log sheets, test reports/certificate. etc. shall be furnished to BHEL at the appropoate stages or at the time of final inspection, as required.
8. This Quality Plan is also applicable to spares, if any, under scope of supply of Vendor.
9. The quality plan shall be submitted in minimum 4 copies with a soft copy of the same or in line with contract requirements.

ANNEXURE-2 to Quality Plan

(LIST OF BHEL- PEM APPROVED GALVANIZERS)

SL. NO.	ITEM	VENDOR NAME	ADDRESS
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
4	Galvanising	B.P. Projects PVT LTD	167A, Vivekananda Road Kolkata-700006
5	Galvanising	Standard Galvanisers	Makardah Road, Kabar Para, Bankra, Howarah -711403
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 Simlla, P.S. - Singur, Dist - Hoogly, Pin-712223
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 Metals	G-97, MIDC, Bhutibori , Nagpur
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	Passive Infra Projects Pvt. Ltd	8th KM Stone, Sampla Kharkhoda Road, Hassangarh, Rohtak, Haryana
19	Galvanising	Rukmani Electrical & Fabricators Pvt. Ltd.	Urla Industrial Area, Urla Sarora Road, Raipur- 493 221 (Chhattisgarh) Shankharidaha Baniyarah, Jalan Industrial Complex, Gate no.3, Lane no. 4, Domjur, Howrah , W.B. - 71141
20	Galvanising	DMP Projects Pvt.Ltd.	Dulagarh Industrial Park , PS-Sankrail , Howrah -711302
21	Galvanising	Vinfab Engineers India Private Limited	Gut no. 224/1 &2 Bhiwandi Wada State Highway, Village khupri, Dist. Thane, Maharashtra -421303
22	Galvanising	Saral Projects & Processors	B-1, Industrial Area, Site-II, Amawan Road Rae Bareli
23	Galvanising	Jamna Metal Company	D - 1513, DSIDC, Narela Industrial Area Delhi - 110040, India
24	Galvanising	Brahampuri Steels Limited	172 (F) Industrial Area, Jhotwara, Jaipur-302013
25	Galvanising	Indiana Gratings PVT. LTD	F-5, MIDC Jejuri, Pune-412 303

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 WITHOUT ANY COMMERCIAL IMPLICATION TO BHEL.



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(WELDED TYPE)**

SPECIFICATION NO. PE-TS-417-507-E012

VOLUME II

SECTION II

REVISION 0

DATE: 02.07.2018

SHEET 1 OF 3

SECTION 'II'

STANDARD TECHNICAL SPECIFICATION



DOCUMENT TITLE

**TECHNICAL SPECIFICATION FOR
GALVANISED
CABLE TRAY SUPPORT SYSTEM
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SPECIFICATION NO. PE-TS- 999-507-E012

VOLUME II

SECTION -II

REVISION 0

DATE: 02.07.2018

SHEET 2 OF 3

1.0 GENERAL

This specification covers the design, manufacture, inspection & testing at vendor's works, packing and delivery to site of galvanised mild steel structural members to be used for cable tray support system (welded).

2.0 CODES AND STANDARDS

- 2.1 The material shall comply with all currently applicable safety codes and statutory regulations of India as well as of the locality where the material is to be installed.
- 2.2 The design, material, construction, manufacture, inspection, testing and performance of cable tray support system (welded) shall conform to the latest revision of relevant standards and codes of practices as per Annexure-III.
- 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 Bill of Quantities (Annexure-I of the NIT) shall be manufactured as per Datasheet-A.
- 3.2 Straight lengths of hot dip galvanised MS channels and angles of sizes indicated in Datasheet – A shall be supplied.
- 3.3 All finished galvanised MS structural members for cable tray supports shall be free from sharp edges, corners, burs & unevenness.

4.0 QUALITY/ INSPECTION:

- 4.1 BHEL's Standard QP (QP NO. PED-507-00-Q-007/02) is enclosed as per Annexure-II 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.
- 4.2 All materials shall be procured, manufactured, inspected and tested by vendor/ subvendor 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 equipments & components shall be deemed to be included in the bid price.

5.0 PACKING

The material shall be packed to ensure protection against damage during transit, storage for prolonged periods and handling.

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 "Contents" with bidder's signature & company stamp
 - A copy of sheet "Instructions to bidders for preparing Technical offer" with bidder's signature & company stamp.
 - Unpriced copy of "Annexure-I (Bill of Quantities)" with bidder's signature & company stamp.

	DOCUMENT TITLE TECHNICAL SPECIFICATION FOR GALVANISED CABLE TRAY SUPPORT SYSTEM (WELDED)	SPECIFICATION NO. PE-TS- 999-507-E012	
		VOLUME II	
		SECTION -II	
		REVISION 0	DATE: 02.07.2018
		SHEET 3 OF 3	

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.

- 7.2 Documents to be submitted by successful bidder after award of contract shall be as per Annexure-II.
- 7.3 Vendor drawing/ document schedule for the project shall be as per Annexure-III.



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VOLUME II

SECTION -II

REVISION 0

DATE: 02.07.2018

SHEET 1 OF 1

DATASHEET A

(SPECIFIC TECHNICAL REQUIREMENTS)

1.0 APPLICABLE STANDARDS:

- a) IS: 2062 For Structural steel.
- b) IS: 2629 For hot dip galvanising of steel & surface pre treatment.
- c) IS: 2633 For testing of zinc coating.
- d) IS: 6745 For determining of mass of zinc coating.
- e) IS: 1852 For rolling & cutting tolerances of hot rolled steel products.
- f) IS: 4759 For hot-dip zinc coatings on structural steel & other allied products

2.0 GALVANISED CABLE TRAY SUPPORT SYSTEM (WELDED):

- a) Material: Hot Rolled Mild Steel
- b) Length: Standard length of 5.5m to 6.5m
- c) Sizes: As per Annexure-I (BOQ cum Price schedule) attached
- d) Type: Hot-dip galvanised

3.0 SURFACE TREATMENT:

Galvanizing:

- a) Pre-treatment: As per IS 2629 prior to galvanisation
- b) Type: Hot dip galvanization
- c) Applicable Standard: IS 2629
- d) Minimum thickness: 75 microns (minimum)
- e) Min. weight of:
Zinc deposit: 610 gms. per square meter
- f) Tests for galvanizing:
 - i) Weight of zinc coating as per IS : 6745
 - ii) Thickness of zinc coating as per IS : 4759
 - iii) Uniformity of zinc coating as per IS : 2633
 - iv) Adhesion as per IS: 2629