BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION PROJECTS ENGINEERING MANAGEMENT

DOCUMENT No.	TB-394-316-153	Rev. No.	00		Prepared	Checked	Approved
TYPE OF DOC.	TECHNICAL SPECIFICATION			NAME	SK	SK	RS/DM
TITLE	CABLE TRENCH MATERIAL (CABLE RACKS AND TRAYS)			SIGN		05/02/18	6/2/18
				DATE	05.02.18		
				GROUP	TBEM	W.O. No	86009
CUSTOMER	Tamilnadu Transmission Corporation Limited (TANTRANSCO)						
PROJECTS	765/400kV AIS S/S Ariyalur						

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CONTENTS

Rev No.	Date	Altered	Checked	Approved	REVISION DETAILS			
				Distribution	*TBMM*	*TBQM*	*TBCM*	*TBTS*
				Copies	-	-	01	-

CHECKLIST FOR TECHNICAL EVALUATION

Along with the Technical Bids of the offers, the Bidder should submit this checklist confirming the inclusion of the enclosures as listed below. (Shall tick as ✓)

Sr No	Documents to be enclosed	Bidder to check & confirm
1	Copy of Unpriced BOQ as enclosed in the Technical Specification to confirm that bidder has quoted as per BOQ OF SECTION-1	
2.	Schedule of Technical Deviation format duly signed.	
3.	Supporting documents as asked in the Technical requirements (if applicable as per tender requirements)	
4.	Checklist of Technical parameters as per Section-5 duly filled and signed.	
5.	Compliance to Technical Specification	

NOTE:- If the Bidder fails to submit any of the documents as asked in the above check list, their bid is likely to be rejected / not evaluated.

The above checklist is verified for:-

NIT Ref No. :

Name of Equipment :

Name of Project :

Name of Bidder :

Signed with Seal of Bidder.

Date .....

SECTION 1
SCOPE AND SPECIAL TECHNICAL REQUIREMENT

1.0 SCOPE

This technical specification covers the requirements of design, manufacture, testing at works, packing and dispatch of Cable Trench Material (Cable Racks Assemblies , Trays and perforated tray cover) to site.

The specification comprise of following sections:

Section-1: Scope, specific technical requirements & Bill of Quantities.
Section-2: Equipment specifications
Section-3: General technical requirements for all equipment's under the project.
Section-4: Guaranteed Technical Particulars
Section -5 : Check list

In case of any conflict between various sections, order of precedence shall be in the same order as listed above.

The Trench material are required for the following Projects:

Customer :**Tamilnadu Transmission Corporation Limited (TANTRANSCO)**
Project : **765/400kV AIS S/S Ariyalur**

2.0 TECHNICAL REQUIREMENTS:

(a) Cable Trays:

S. No.	Particulars	Data
1)	Material of cable trays:	Galvanized Mild Steel
2)	Width (mm)	As per BOQ
3)	Thickness of sheet metal for trays & fittings etc:	2 mm thick
4)	Whether Ladder type or perforated type	Ladder and perforated type
5)	Mass of Zinc coating	460 gm/sq m
6)	Length of single cable tray piece	2.5 m
7)	Accessories:	Coupler Plates and associated Hardware
8)	Reference drawing	Annexure-2(For Ladder) , Annexure-3(For perforated)

(b) Horizontal Cable Racks assembly :

S. No.	Particulars	Data
1)	Material of cable racks:	Galvanized Mild Steel
2)	Size and material of cable rack assemblies	65x65x6 (thick) mm MS angles
3)	Weight of Zinc coating	610 gm/sq m
4)	Reference drawing	Annexure-1

(c) Under hanger Cable Racks assembly :

S. No.	Particulars	Data
1)	Material of cable racks:	Galvanized Mild Steel
2)	Size and material of cable rack assemblies	65x65x6 (thick) mm MS angles and ISMC channel 150
3)	Weight of Zinc coating	610 gm/sq m
4)	Reference drawing	Annexure-1

(d) Cover of perforated Trays:

S. No.	Particulars	Data
1)	Material of cable trays:	Galvanized Mild Steel
2)	Width	As per BOQ
3)	Thickness of sheet metal for cover	1.6 mm thick
4)	Mass of Zinc coating	460 gm/sq m
5)	Length of cover	2.5 m
6)	Accessories:	2 nos. clamps (25x3 mm GI flat) for each tray
7)	Height	15mm

3.0 BILL OF QUANTITIES – As per Annexure-A

Note –1 Quantity may vary by +/- 30%.
Note-2- The bidder shall indicate in his offer the final weight of the tray after punching and galvanizing.
Note-3- The bidder shall indicate in his offer the final weight of the cable rack assembly after galvanising.
Note -4- Cable trench material (rack assembly, Cover and tray) shall be supplied in number only, but payment shall be made in MT.

4.0 INSPECTION & TESTING:-

Before being fitted on the equipment, all components shall be subjected to routine tests at the Contractors factory, as per the relevant IEC/IS standards. A detailed test report proving the successful passing of such tests shall be provided.

Prior to dispatch, the routine & acceptance tests shall be carried out on equipment in accordance with the applicable IEC /IS and the material shall be offered for final inspection to BHEL and TANTRANSCO in accordance with agreed quality plan with 3 weeks advance information.

5.0 QUALITY PLAN:-

The contractor shall carry out contract works in accordance with sound quality management principles which shall include such as controls which are necessary to ensure full compliance to all requirements of the specification & applicable international standards. These quality management requirement shall apply to all activities during design, procurement, manufacturing, inspection, testing, packaging, shipping, inland transportation, storage, site erection & commissioning. Contractor shall submit detailed Quality Plan for BHEL / TANTRANSCO approval within 1 week of P.O. placement.

	765kV/400KV Ariyalur			
	BOQ of Cable Trench Material (ANNEXURE-A)			Rev -00
Sl. No	Description	Qty (Nos.)	Unit weight (kg)	Total Qty (MT)
1	Galvanized mild steel Ladder type cable tray 2.5 m long, 600mm wide, 100 mm high, 2 mm thick, having slotted rung spacing of 250 mm, along with 2 Nos. side coupler plate and 16 Nos., M8 bolts with nuts and washers for coupling two trays as per Annexure-2	3632	18.65	67.732
2	Galvanized mild steel Ladder type cable tray 2.5 m long, 450mm wide, 100 mm high, 2 mm thick, having slotted rung spacing of 250 mm, along with 2 Nos. side coupler plate and 16 Nos., M8 bolts with nuts and washers for coupling two trays as per Annexure-2	484	16.75	8.108
3	Galvanized mild steel Ladder type cable tray 2.5 m long, 450mm wide, 100 mm high, 2 mm thick, having slotted rung spacing of 250 mm, along with 2 Nos. side coupler plate ,16 Nos., M8 bolts with nuts and washers for coupling two trays and **75mm height separator bolted type alongwith hardware for fixing of separator with tray (separator along the length of tray shall be located 300mm from one end of tray)** as per Annexure-2	3028	21.25	64.336
4	Galvanized mild steel Ladder type cable tray 2.5 m long, 300mm wide, 100 mm high, 2 mm thick, having slotted rung spacing of 250 mm, along with 2 Nos. side plate and 16 Nos., M8 bolts with nuts and washers for coupling two trays as per Annexure-2-	484	14.85	7.188
5	Galvanized mild steel Perforated type cable tray 2.5 m long, 150mm wide, 100 mm high, 2 mm thick, along with 2 Nos. side coupler plate and 8 Nos., M8 bolts with nuts and washers for coupling two trays as per Annexure-3	269	16.00	4.309
6	Galvanized mild steel Perforated type cable tray 2.5 m long, 100mm wide, 50 mm high, 2 mm thick, along with 2 Nos. side coupler plate and 8 Nos., M8 bolts with nuts and washers for coupling two trays as per Annexure-3	98	8.00	0.784
7	3 tier galvanized cable rack assembly with 65x65x6 thick MS angle as per Fig. 1 of Annexure-1	1975	16.269	32.135
8	2 tier galvanized cable rack assembly with 65x65x6 thick MS angle as per Fig. 2 of Annexure-1	807	7.975	6.434
9	1 tier galvanized cable rack assembly with 65x65x6 thick MS angle as per Fig. 3 of Annexure-1	5046	4.031	20.340
10	4 tier galvanized cable rack assembly with 65x65x6 thick MS angle as per Fig. 4 of Annexure-1	49	21.953	1.081
11	3 tier (double side) galvanized under hanger cable rack assembly with 65x65x6 thick MS angle/ISMC 150 Channel as per Fig. 5 of Annexure-1	7	50.976	0.336
12	2500 mm long Galvanized mild steel cover suitable for 150mm wide Perforated type cable tray. Cover shall be 15 mm high, 1.6 mm thick along with 2 Nos. clamps made of 25x3 mm GI flat for each cover	269	6.5	1.750
13	2500 mm long Galvanized mild steel cover suitable for 100mm wide Perforated type cable tray. Cover shall be 15 mm high, 1.6 mm thick along with 2 Nos. clamps made of 25x3 mm GI flat for each cover	98	4.7	0.461

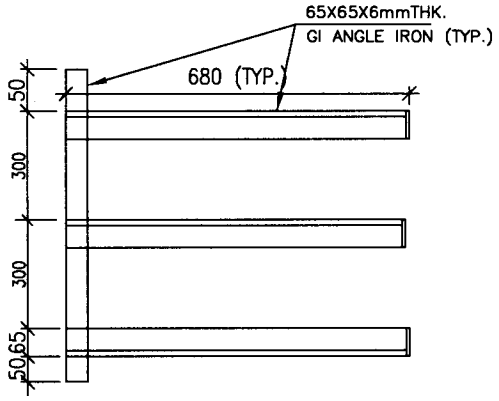


FIGURE –1

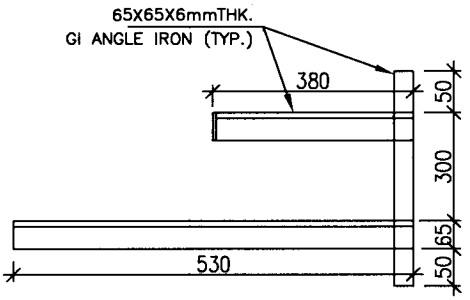


FIGURE –2

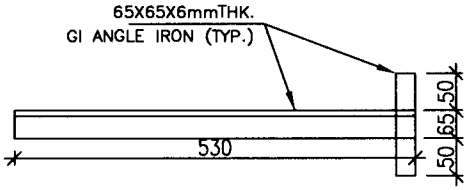


FIGURE – 3

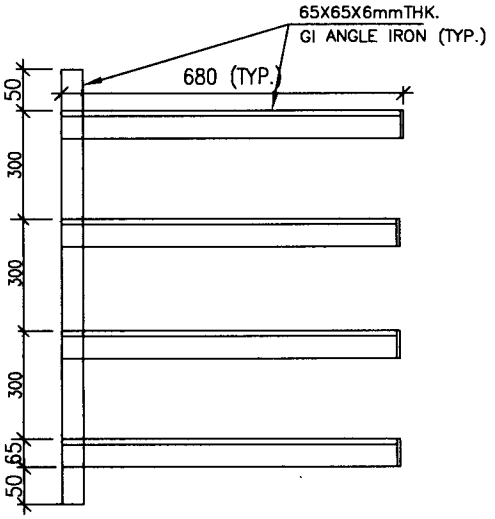
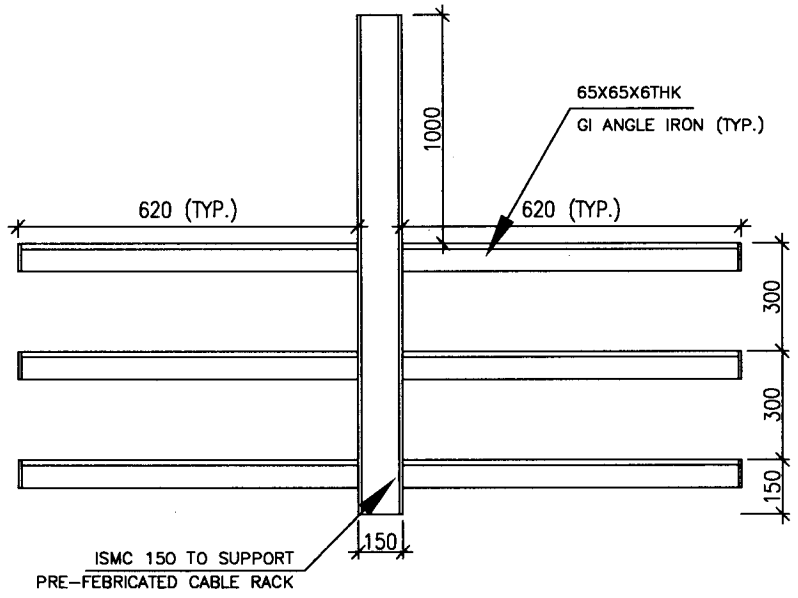


FIGURE – 4

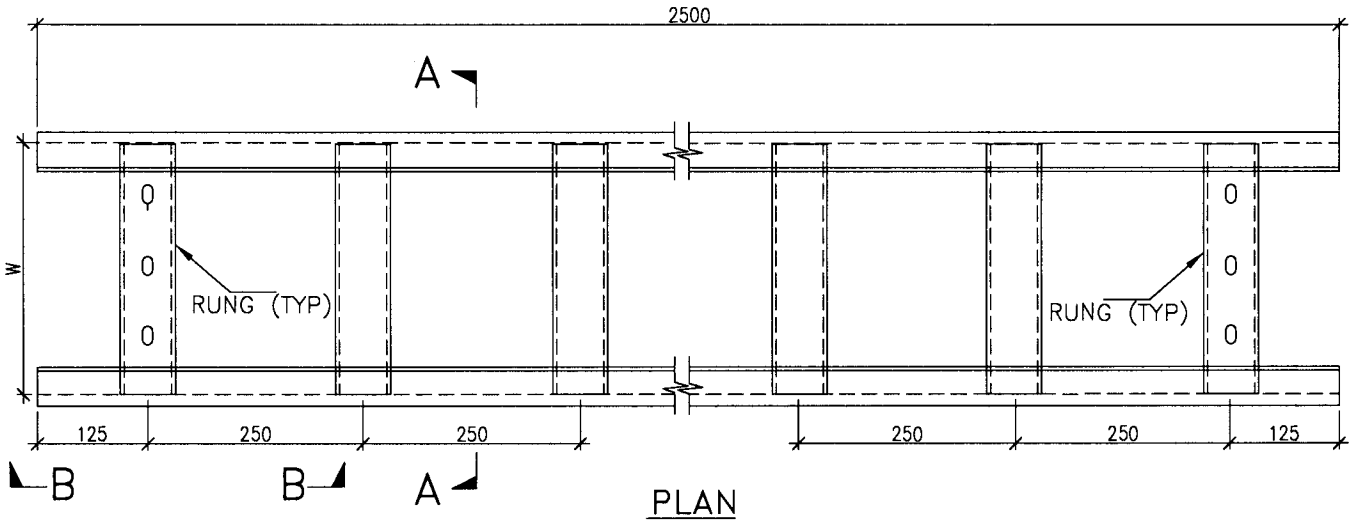


FIGURE–5

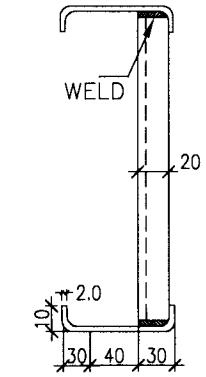
NOTE:–

1. ALL DIMENSIONS ARE IN mm.

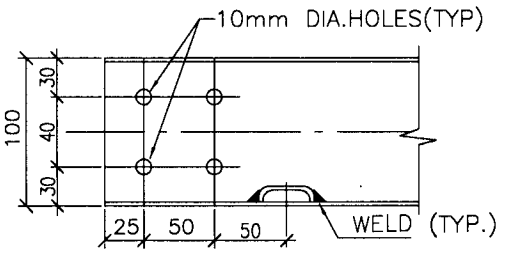
PROJECT– 765/400kV ARIYALUR	ANNEXURE–1	SH.: 1 OF 1



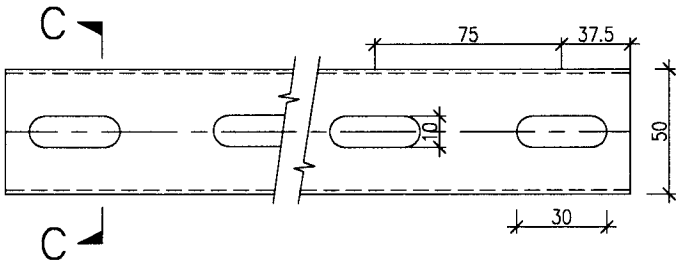
PLAN



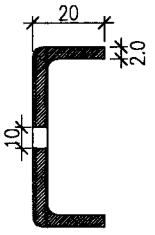
SECTION A–A



SECTION B–B



RUNG PLAN



SECTION C–C

W	600	450	300

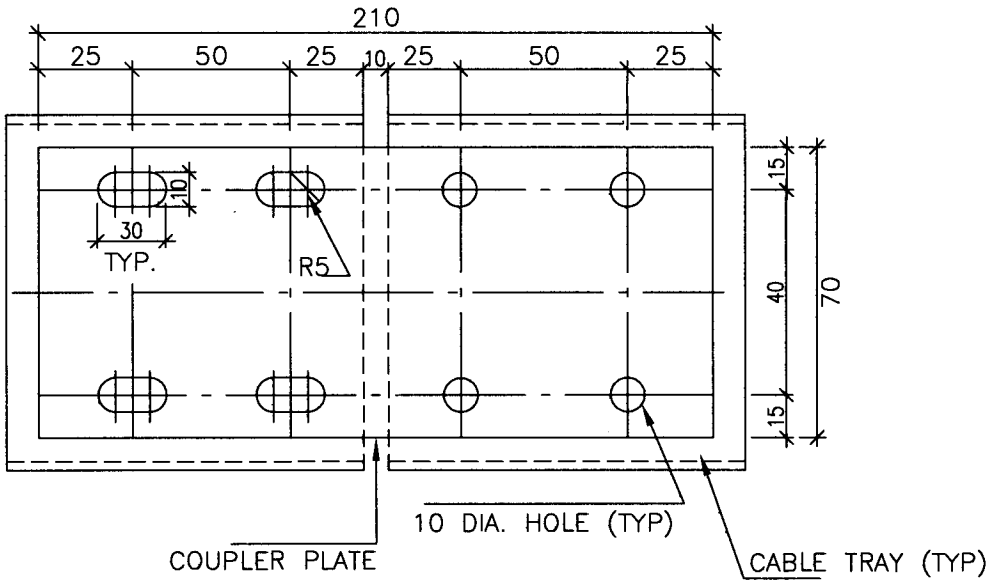
NOTE:–

1. 450MM WIDE LADDER TRAY SHALL BE TWO TYPE.

(a) 450 MM WIDE WITHOUT SEPARATOR

(b) 450MM WIDE WITH 75mm HEIGHT SEPARATOR BOLTED TYPE ALONGWITH HARDWRAE FOR FIXING OF SEPARATOR WITH TRAY(SEPARATOR ALONG THE LENGTH OF TRAY SHALL BE LOCATED 300MM FROM ONE END OF TRAY)

PROJECT– 765/400kV ARIYALUR	ANNEXURE–2	SH.: 1 OF 2

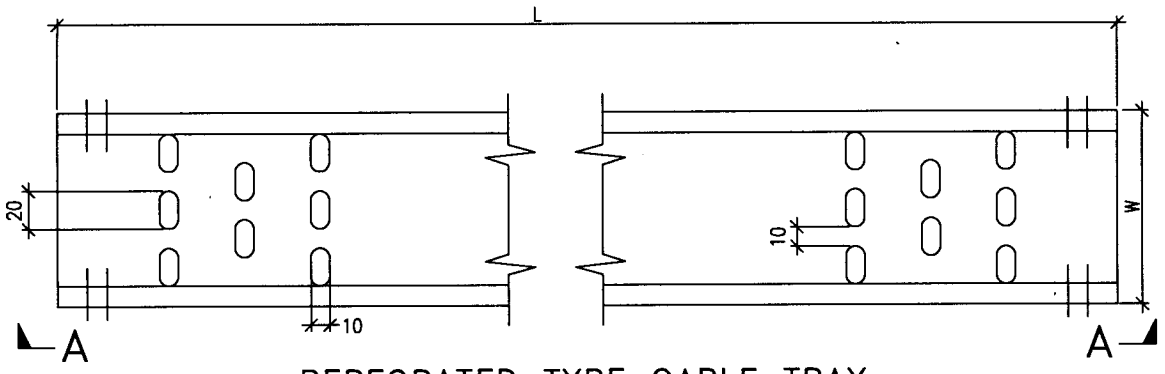


COUPLER PLATE (CP)
(TYP) FOR LADDER TYPE TRAY

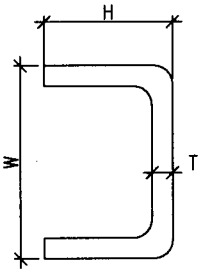
MATERIAL – GALVANISED M.S SHEET (2.0mm THICK)

NOTE:–

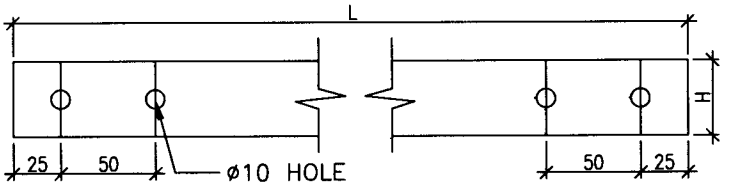
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
2. LADDER TYPE CABLE TRAY SHALL BE FABRICATED FROM MILD STEEL WITH 2mm THICK.
3. SIDE COUPLER PLATE SHALL BE FABRICATED FROM 2mm THICK GALVANISED M.S. FLAT.
4. ALL NUTS, BOLTS AND WASHERS SHALL BE ZINC PASSIVATED.
5. CABLE TRAY ASSEMBLIES SHALL BE FABRICATED AS PER IS : 1079 GRADE "O" / IS : 2026 GRADE "A". OTHERWISE SPECIFIED.
6. CABLE TRAYS, SIDE COUPLER PLATES & CABLE RACK ASSEMBLIES SHALL BE HOT DIP GALVANISED AS PER IS : 2629
7. FABRICATION TOLERANCE ±5mm TO BE ALLOWED.
8. TOLERANCE ON THICKNESS ±0.2 mm TO BE ALLOWED. OTHERWISE SPECIFIED. TOLERANCE ON DIMENSION – AS PER IS 1852.



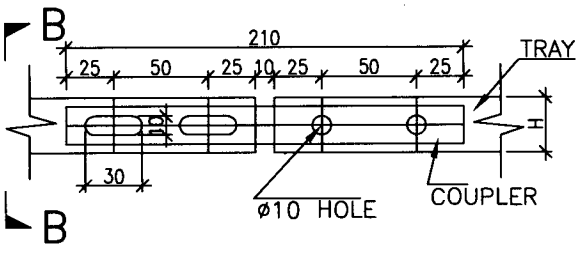
PERFORATED TYPE CABLE TRAY



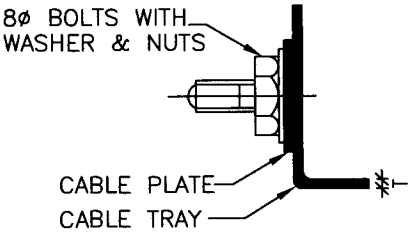
SIDE VIEW



VIEW 'A–A'



COUPLER JOINT



SECTION B–B

MATERIAL : M.S SHEET 2mm THK. (T) AS PER IS : 1079/10748/2062/5986

FINISH : HOT DIP GALVANISED (460gm/m^2) AS PER IS : 2629,1985 & IS : 4759)

NOTE:–

1. UNLESS OTHERWISE STATED ALL DIMENSIONS ARE IN mm.
2. MATERIAL SHALL BE GALVANISED SHEET STEEL AS PER IS : 2629.
3. TOLARANCE : THICKNESS ±0.2, WEIGHT ±2, HEIGHT ±2 AND LENGTH ±15.
4. ALL NUT BOLTS & WASHERS SHALL BE EKECTRO PLATED.

WIDTH (W) = 150mm,100mm

HEIGHT (H) = 100mm,50mm

THICK (T) = 2mm

LENGHT (L) = 2500mm

PROJECT– 765/400kV ARIYALUR	ANNEXURE–3	SH.: 1 OF 1

SECTION-2

2.1 GENERAL

This section covers the general technical requirements of Cable Trench Material. In case of any discrepancies between the requirements mentioned in this section and those specified in other sections of this specification, the latter shall prevail and shall be treated as binding requirements.

2.2 TECHNICAL PARAMETERS

A. Rack/Hanger assembly

Material of cable racks	:	MS
Size and material of cable rack assemblies	:	65 x 65 x 6 (thick) mm MS angles/ ISMC channel 150
Whether Galvanised or Painted	:	Galvanised
Mass of Zinc coating	:	610 g/sqm.

B. Cable Trays

Material of cable trays	:	Galvanised/MS
Thickness of sheet metal for trays & fittings etc.	:	Rung - 2mm thick Side member- 2mm thick
Whether Ladder type or perforated type	:	Ladder /Perforated Type
Mass of Zinc coating	:	460 g/sqm.
Thickness of sheet metal for trays	:	2 mm
Accessories	:	Coupler Plates and associated Hardware

2.3 APPLICABLE STANDARDS

The Cable Trench Material shall conform to latest revision of the following Indian Standards:

Steel for general structural purpose	:	IS:2062
Hot Rolled Carbon Steel Sheets and Strips specification	:	IS:1079
Mechanical Testing of Metals - Tensile Testing	:	IS:1068
Dimensions for steel plates, sheets strips and flats for general engineering purpose	:	IS:1730
Method of Tensile Testing of sheet steel and strip of thickness 0.5 to 3 mm	:	IS:1608

General technical delivery requirements for steel and steel products	:	IS: 8910
Method of chemical analysis of pig iron, Cast iron and plain carbon and low alloy steel, Part-1	:	IS:228
Method for testing uniformity of coating on Zinc coated articles	:	IS:2633
Recommended practice for hot dip galvanising on iron & steel	:	IS:2629
Hot dip Zinc coating on structural steel and other allied products	:	IS:4759
Method for determination of mass of zinc coating on zinc coated iron and steel articles	:	IS:6745
Rolled steel beams, channel and angles	:	IS:808
Rolling and Cutting tolerances for rolled steel products	:	IS:1852
Recommended practice for red oxide And zinc chromate on iron & steel	:	IS:2074

Latest version of all the standard shall be referred

2.4 TECHNICAL REQUIREMENTS OF CABLE TRAYS

2.4.1 The cable trays shall be ladder/perforated type.

2.4.2 The material (Mild Steel) used for the supply shall be in sound condition and of recent manufacture, free from defects, loose mill scale, slag, pitting, rust, etc.

2.4.3 The cable trays shall be hot dip galvanised (zinc coating).

2.4.4 The min. weight of zinc coating shall be 460gm/m^2.

2.4.5 The trays shall not have sharp edges cuts, abrasions etc. and the zinc coating shall be adherent, smooth and reasonably bright, continuous and free from such imperfections as flux, ash, bare and black spot, pimples, lumpiness, rust stains, bulky white deposits and blisters.

2.4.6 All drilling, cutting, bending etc. of fabricated steel work shall be carried out before galvanising. After galvanising, no drilling or welding shall be performed on the galvanized parts of the equipment excepting that nuts may be threaded after galvanizing. Sodium dichromate treatment shall be provided to avoid formation of white rust after hot dip galvanisation.

2.4.7 Bolts and nuts shall be of steel with hexagonal head of approved supplier. All bolts shall be galvanised including threaded portions. The threaded portions of all bolts shall be cleared of smear by spinning / brushing. All washers and nuts shall also be galvanised but threading of nuts shall be oiled / greased.

2.4.8 All angles / flats etc. shall be cut with shearing machine / power hack-saw, cutting with gas welding is not permitted.

2.4.9 The bidder shall indicate in his offer the final weight of the tray after punching and galvanising.

2.5 TECHNICAL REQUIREMENTS OF RACK/HANGER ASSEMBLY

2.5.1 The material (Mild Steel) used for the supply shall be in sound condition and of recent manufacture, free from defects, loose mill scale, slag, pitting, rust, etc.

2.5.2 The cable rack/hanger assembly shall be hot dip galvanised.

2.5.3 Galvanising of the rack/hanger assembly shall be done. The min. thickness of coating shall be 85 micron for all items thicker than 6 mm. For item with thickness lower than 6 mm requirement of coating thickness shall be as per relevant ASTM. Coating shall be adherent, smooth and reasonably bright, continuous and free from such imperfection as flux, ash, bare and black spot, pimples, lumpiness, rust stains, bulky white deposits and blisters and zinc chromate/red oxide shall conform to IS : 2074.

2.5.4 The hanger assemblies shall not have sharp edges cuts, abrasions etc. and the zinc coating shall be adherent, smooth and reasonably bright, continuous and free from such imperfections as flux, ash, bare and black spot, pimples, lumpiness, rust stains.

2.5.5 All drilling, cutting, bending etc. of fabricated steel work shall be carried out before galvanising.

2.5.6 All angles shall be cut with shearing machine / power hack-saw, cutting with gas welding is not permitted.

2.5.7 The bidder shall indicate in his offer, the final weight of the rack after punching and galvanising.

2.6 TESTS

Details of tests for Cable Trench Material shall be as follows:

2.6.1 Cable Trays

1. Dimensional and visual examination - As per BHEL approved drawing.

2. Mass of Galvanisation - IS: 6745:

2. Uniformity of zinc coating - IS: 2633

4. Deflection Test: (Type test)
A 2.5 metre straight section of each type of cable trays shall be simply supported at the two ends. A uniformly distributed load of 76 Kg per metre will be applied along the length of the tray. The maximum deflection at mid span shall not exceed 7 mm.

2.6.2 Rack/Hanger Assembly

1. Dimensional and visual examination - As per BHEL approved drawing.

2. Mass of Galvanisation - IS: 6745

3. Test for galvanising (Acceptance Test)
The test shall be done as per approved standards

4. Uniformity of zinc coating - IS: 2633

5. Mass of zinc coating – IS: 6745

6. Chemical composition test -As per IS:2062

7. Tensile - As per IS:2062

8. Bending test -As per IS:2062

SECTION – 3

GENERAL TECHNICAL REQUIREMENTS

3.0 FOREWORD

The provisions under this section are intended to supplement general requirements for the materials, equipment's and services covered under other sections.

3.1 PROJECT INFORMATION AND SYSTEM PARAMETERS

a) Customer : M/s Tamil Nadu Transmission Corporation Limited

b) Project Title : 765/400KV AIS SUB STATION AT ARIYALUR

c) Transport facilities : Road/Rail

Physical and other parameters:

3.1.1 Location of the substation

3.1.2 Nearest Railway station : Tindivanam
Railway : Southern Railway

3.1.3 Meteorological data

(i)	Atmosphere	: Polluted
(ii)	Maximum ambient temperature	: 50°C
(iii)	Minimum ambient temperature	: 20°C
(iv)	Maximum daily average ambient air temperature	: 45° C
(v)	Maximum yearly average ambient air temperature	: 32° C
(vi)	Maximum Humidity (%)	: 100%
(vii)	Average thunder storm days per annum	: 50
(viii)	Average rainy days per annum	: 65
(ix)	Average annual rainfall (mm)	: 750 mm
(x)	No. of months during which tropical monsoon condition prevail	: 3
(xi)	Maximum wind pressure	: 150 Kgf/Sqmm
(xii)	Altitude above MSL	: <1000M
(xii)	Basic Wind Speed	: **39 m/s (Zone -2)**

However for design purpose, ambient temperature should be considered as 50° C and relative humidity as 100%.

3.2 STANDARD:

The works covered by the specification shall be designed, engineered, manufactured, built, tested and commissioned in accordance with the Acts, Rules, Laws and Regulations of India.

The equipment to be furnished under this specification shall conform to latest issue with all amendments (as on the date of bid opening) of standards specified in each section.

The Bidder shall note that standards mentioned in the specification are not mutually exclusive or complete in themselves, but intended to compliment each other.
The Bidder shall also note that list of standards presented in this specification is not complete. Whenever necessary the list of standards shall be considered in conjunction with specific IS/IEC. When the specific requirements stipulated in the specifications exceed or differ than those required by the applicable standards, the stipulation of the
specification shall take precedence.

3.3 TYPE TEST:

The Type Test for all the equipment's/materials used for this project should have been conducted in any approved Government/Govt. recognized laboratories conforming to latest IS/IEC. The above type test certificates should accompany the drawings of the materials equipment's, duly signed under seal by the Institution, who have issued the type test certificate. The above type test should have been conducted not earlier than Ten years , subject to no change in design as on the originally scheduled date of technical bid opening i.e. **30.09.2016**

In case the type tests were conducted earlier than 10 (ten) years prior to the originally scheduled date of bid opening, the contractor shall repeat these test (s) at no extra cost to the purchaser.

3.4 INSPECTION:

The inspection may be carried out by the TANTRANSCO/BHEL at any stage of manufacture. The supplier shall grant free access to TANTRANSCO's/BHEL representative at a reasonable time when the work is in progress. The TANTRANSCO/BHEL shall have access at all times to the works and all other places of manufacture/fabrication, where the equipments are being manufactured/fabricated and the bidder shall provide TANTRANSCO's/BHEL representative all facilities for unrestricted inspection of the works, raw materials, manufacture of all the accessories and for conducting necessary tests.

Inspection and acceptance of any equipment under this specification by the TANTRANSCO/BHEL shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specification and shall not prevent subsequent rejection if the equipment is found to be defective. The supplier shall keep the TANTRANSCO/BHEL informed in advance, about the manufacturing programme so that arrangement can be made for inspection.
The TANTRANSCO/BHEL , reserves the right to insist for witnessing the acceptance/routine testing of the bought out items. No material shall be dispatched from its point of manufacture unless the material has been satisfactorily inspected and tested.

The correct grade and quality of steel shall be used by the supplier. To ascertain quality of steel, the TANTRANSCO/BHEL may at his discretion get the material tested at an approved laboratory.

The bidder shall take an account the fabrication wastage while quoting the rates. The Employer will not accept any liability in connection with the wastage of steel during fabrication or otherwise. Steel shall be procured exclusively from the main producers. However, sections not rolled by main produces can be procured from reroller , provided rerolling of structural steel section is done rom billets/ingots of tested quality. Rerolled sections are duly tested as per relevant standards. Supplier should obtain approval of list of primary producers of Steel and Zinc before Proto assembly .

The BHEL/TANTRANSCO or his representative shall have the right to inspect and/or test the goods /works to confirm their conformity to the supplier. BHEL/TANTRANSCO shall notify the supplier in writing of the identity of any representatives authorized for these purposes.

The inspections and tests may be conducted on the premises of the supplier or his Sub vendor at the point of delivery and /or at the goods' final destination. Where tests are conducted in the premises of Supplier, all reasonable facility and assistance including access to drawings and production data shall be furnished at no charge to the BHEL.

Should any inspected or tested goods fail to conform to specifications, the BHEL/TANTRANSCO may reject them and the supplier shall either replace the rejected goods or make all alterations necessary to meet specification requirements free of cost to the BHEL/TANTRANSCO within one week of intimation.

The BHEL/TANTRANSCO's right to inspect, test and where necessary reject the goods after the goods; arrival at the site, shall in no way be limited or waived by reason of the goods having been previously inspected. Tested and passed by the BHEL/TANTRANSCO or his representative prior to the goods dispatch.

Not less than 15 (Fifteen) days advance intimation shall be given about the quantity of materials that will be ready for inspection by the officers of TANTRANSCO/ BHEL/Third agency authorized by the Corporation. The materials should not be dispatched without instruction from the Corporation.

3.5 QUALITY ASSURANCE PLAN :

The bidder shall invariably furnish following information along with his offer. (i) Statement giving list of important raw materials including but not limited to:

(a) Contact material
(b) Insulation
(c) Porcelain
(d) Sealing material
(e) Contactor, limit switches, etc. in control cabinet.

Name of sub-supplier for the raw materials, list of standards according to which the raw materials are tested, list of test normally carried out on raw materials in presence of bidder's representative, copies of test certificates.

(ii) Information and copies of test certificates as in
(i) above in respect of bought out accessories.
(iii) List of areas in manufacturing process, where such inspections are normally carried out for quality control and details of such tests and inspections.
(iv) Special features provided in the equipment to make it maintenance free.
(v) List of testing equipment available with the Bidder for final testing of breakers vis-à-vis, the type, special, acceptance and routine tests specified in
the relevant standards. These limitations shall be very clearly brought out in the relevant schedule i.e. schedule of deviations from specified test requirements.

The supplier shall submit following information to the TANTRANSCO.

1) List of raw materials as well bought out accessories and the names of sub-suppliers selected from those furnished along with offer.
2) Type test certificates of the raw material and bought out accessories.
3) Quality assurance plan (QAP) withhold points for TANTRANSCO inspection. The quality assurance plan and hold point shall be discussed between the employer and supplier before the QAP is finalized.
The supplier shall submit the routine test certificates of bought out items and raw material, at the time of routine testing of the fully assembled breaker.

3.6 APPROVAL PROCEDURE

The scheduled dates for the submission of drawings as well as for, any data/information to be furnished by the Employer would be as per the following schedule. The supplier shall also submit required no. of copies as mentioned in this specification of all drawings/design documents/test reports for approval by the BHEL/TANTRANSCO. The following schedule shall be followed generally for approval.

i.	First Submission	7 days after LOI/PO
ii.	Approval/comments/by employer on Initial submission	Reasonable time
iii.	Resubmission	Within 7 days (whenever from date of comments required) Including both ways postal time.
iv.	Approval or comments	Within 2 weeks of receipt of resubmission.
v.	Furnishing of distribution copies	2 weeks from the date of last approval.

Note: The supplier may please note that all resubmissions must incorporate, all comments given in the submission by the BHEL/TANTRANSCO failing which the submission of documents is likely to be returned. Every revision shall be a revision number, date and subject, in a revision block provided in the drawing, clearly marking the changes incorporated.

The title block of drawings shall contain the following information incorporated in all contract drawings. Please refer below mention Title block for Submission of Documents.

Title Block

Customer	**M/s Tamil Nadu Transmission Corporation Limited**
Project:	**765/400KV Air Insulated substation Ariyalur**
Contractor	**BHEL**

3.7 DOCUMENTS TO BE SUBMITTED ALONGWITH OFFER

Drawings, GTP ,Type Test Reports and List of Past Supplies. Drawings & Documents submitted at the time of offer shall be subject to review at contract stage.

3.8 DOCUMENTATION SCHEDULE

Following Documentation schedule to be followed per project.

S. No.	DESCRIPTION	TENDER STAGE	CONTRACT STAGE FOR APPROVAL	FINAL DOCUMENTATION	
			Prints	Prints	CDs
1	Drawings and Data Sheets	1	7	10	5
2	Drawings "As Built "	-	-	10	
3	Type Test Reports	1	7	10	
4	Erection Manuals	-	7	10	
5	Operation and Maintenance Manuals	-	7	10	
6	Manufacturing Quality Plan	-	7	10	
7	Field Quality Plan	-	7	10	
8	Inspection Test Reports	-	7	10	

Note: Drawings will also be submitted in CD/DVD in Latest AUTOCAD-2004 or Later version or any other CAD package along with conversion files for all major items. Final Documentation shall be submitted in bound volumes with details of Customer & Project etc. written on top.

SECTION -4

GUARANTEED TECHNICAL PARTICULARS (CABLE RACKS)

(To be submitted by the supplier at the contract execution stage)

1.0	Name of the Project	:
2.0	Tenderer's Name and Address	:
3.0	Manufacturer's Name and Address	:
4.0	Applicable Standards	:
5.0	Application	:
6.0	Material specification	:
7.0	Weight of Zinc coating	:
8.0	Min. thickness of Zinc coating at any spot	:
9.0	Dimension of angle used for fabricating Rack assembly	:

Name of the firm:----------

Signature of the Tenderer:----------

Designation:----------

Date:

Place:

SECTION -4

GUARANTEED AND TECHNICAL PARTICULARS (CABLE TRAYS)

(To be filled and submitted at Contract stage)

1.0	Name of the Project	:
2.0	Tenderer's Name and Address	:
3.0	Manufacturer's Name and Address:	
4.0	Applicable Standards	:
5.0	Application	:
6.0	Material specification	:
7.0	Thickness of sheet metal for cable trays, fittings etc.	:
8.0	Maximum permissible loading for a 2.5 m. long simply supported at both ends	:
9.0	Corresponding deflection at centre, for the loading as in 8.0 above	:
10.0	Weight of Zinc coating	:
11.0	Min. Thickness of Zinc deposit at any spot	:
12.0	Length of single cable tray piece	:
13.0	Maximum permissible loading at another end of tray.	:

Name of the firm:----------

Signature of the Tenderer:----------

Designation:----------

Date:

Place:

SECTION -5
(CABLE RACKS)
CHECK LIST FOR INFORMATION TO BE FURNISHED WITH OFFER RETURN THIS CHECKLIST AS PART OF THE OFFER DULY SIGNED

The offer may not be considered if the following information and this Checklist are not enclosed with the Offer.

BHEL ENQUIRY. NO:
BIDDER OFFER REFERENCE:

(1)	(2)	(3)	(4)	(5)
S.No.	**Parameter**	**Requirement**	**Yes / No**	**Remarks in case reply in Col (4) is *NO***
A)	Rack assembly (Fig.1 to 4)	As per Annexure-1	YES / NO	
B)	Hanger assembly (Fig. 5)	As per Annexure-1	YES / NO	
1.	Weight of zinc coating	610gm/m^2	YES / NO	
2.	Min. thickness of zinc coating at any spot	85 micron	YES / NO	
3.	Material certificate	As per Relevant Standards (cl.2.3 of section -2)	YES / NO	
4.	Conformance to the Applicable standard	IS:2629, IS:2633, IS:6745, IS:4759	YES / NO	

Name of the firm:----------

Signature of the Tenderer:----------

Designation:----------

Date:

Place:

Section -5
(CABLE TRAYS)
CHECK LIST FOR INFORMATION TO BE FURNISHED WITH OFFER RETURN THIS CHECKLIST AS PART OF THE OFFER DULY SIGNED

The offer may not be considered if the following information and this Checklist are not enclosed with the Offer.

BHEL ENQUIRY. NO:
BIDDER OFFER REFERENCE:

(1)	(2)	(3)	(4)	(5)
S.No.	**Parameter**	**Requirement**	**Yes / No**	**Remarks in case reply in Col (4) is *NO***
1.	Equipment	Cable tray	YES / NO	
2.	Thickness of Tray	2.0mm	YES / NO	
3.	Type of cable-tray	Ladder/Perforated	YES / NO	
4.	Material certificate	As per Relevant Standard	YES / NO	
5.	Weight of zinc coating	460gm/m^2	YES / NO	
6.	Maximum permissible deflection at centre of 2.5m long tray simply supported at both ends after applying the uniformly distributed required load of 76 Kg per metre	$\leq$ 7mm	YES / NO	
7.	Required accessories as per (As per cl. 3 of Section-1 of Technical spec.)	Included	YES / NO	
8.	Material certificate	As per Relevant Standards (cl.2.3 of section -2)	YES / NO	
9.	Conformance to the Applicable standard	IS:2629, IS:2633, IS:6745, IS:4759	YES / NO	
10.	Deflection type test on tray as per cl. No. 2.6.2 of section -2	Available	YES / NO	

Name of the firm:----------

Signature of the Tenderer:----------

Designation:----------

Date:
Place:

Section -5
(CABLE TRAYS COVER)
CHECK LIST FOR INFORMATION TO BE FURNISHED WITH OFFER RETURN THIS CHECKLIST AS PART OF THE OFFER DULY SIGNED

The offer may not be considered if the following information and this Checklist are not enclosed with the Offer.

BHEL ENQUIRY. NO:
BIDDER OFFER REFERENCE:

(1)	(2)	(3)	(4)	(5)
S.No.	**Parameter**	**Requirement**	**Yes / No**	**Remarks in case reply in Col (4) is *NO***
1.	Equipment	Cover for Perforated tray	YES / NO	
2.	Thickness of Tray cover	1.6mm	YES / NO	
3.	Weight of zinc coating	460gm/m^2	YES / NO	
4.	Required accessories as per (As per cl. 3 of Section-1 of Technical spec.)	Included	YES / NO	
5.	Length of cover	2500mm	YES / NO	
6.	Height	15mm	YES / NO	

Name of the firm:----------

Signature of the Tenderer:----------

Designation:----------

Date:
Place: