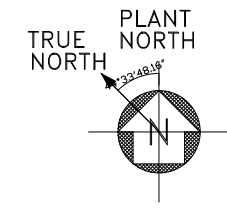


FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

DRAWING NO. TB-0-400-316-002

0.0 N/S

00.00E
00.00N



Skew angle to
marked in all
gantries

SWITCHYARD AREA

RECTOR RAIL

RECTOR RAIL

227.85V
135.50S

400mm WIDE ROAD

400mm WIDE ROAD

200 S

SPARE UNEQUIPPED
BAY-2

SPARE UNEQUIPPED
BAY-1

SPARE EQUIPPED
BAY

VRUDUNAGAR-2

VRUDUNAGAR-1

SAMUGARE-
NGAPURAM-2

SAMUGARE-
NGAPURAM-1

OTTAP-
DARMA-2

OTTAP-
DARMA-1

NOTES:-

- THIS DRAWING SHOULD BE ONLY REFERED FOR CLAMP & CONNECTOR NO.(EKD)
- REFER PAGE 3 TO 6 FOR BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS
- SPACER 701 & 702 TO BE USED TYPICAL AT 3000mm SPACING
- CONNECTOR 902 TO BE USED TYPICAL AT 2000mm SPACING
- CONNECTOR 905 TO BE USED TYPICAL AT 750mm SPACING
- LINE SIDE QUAD MOOSE CONDUCTOR AND ITS STRINGING INSULATOR WITH HARDWARE IS IN TANGEDCO SCOPE*

REFERENCE DRAWINGS

GIS AND POTHEAD YARD PLAN & SECTION LAYOUT DWG. NO. TB-0-400-316-002-REV 02

TATA CONSULTING ENGINEERS LIMITED
VENDOR DRAWING STATUS

CATEGORY	DESCRIPTION
<input type="checkbox"/> CAT-1	Drawing/documents approved for final distribution. BHEL will proceed with manufacturing/ fabrication/construction.
<input checked="" type="checkbox"/> CAT-2	Drawing/documents cleared for manufacturing/ fabrication/construction subject to incorporating the comments given. BHEL to resubmit the drawing for Approval in Category - 1. Comments will be marked on the drawing documents. Drawing document will be corrected as per comment and resubmitted by BHEL for further review/checking.
<input type="checkbox"/> CAT-3	Drawing document of this category are for information only and not for approval. Information furnished on the document is noted.
<input type="checkbox"/> CAT-4	

- Note:
- It is mandatory to close documents with Code 2 & 3 to Code 1 in agreed contract period or 2 weeks, whichever is lower.
 - Any design changes / modification required to be carried out in Code 4 Drawings / Documents shall be the responsibility of BHEL. BHEL to resubmit reflecting the Design Changes for information.

Approval conveyed herein neither relieves the Vendor/Contractor of his contractual obligations and his responsibilities for correctness of dimensions, materials of construction, weights, quantities, design details, assembly fits, performance requirements and conformity of supplies with the Indian Statutory Laws as may be applicable, nor does it limit the purchaser's rights under the contract.

Reviewed by S.S. Satish Date 28-08-2019

THIS DOCUMENT WILL BE APPROVED IN
CAT-2. CAT-1 WILL BE GIVEN AFTER
INCORPORATING VENDOR DETAILS AND
FINAL CIVIL DETAILS.

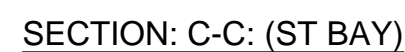
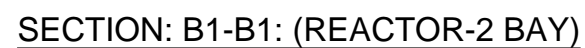
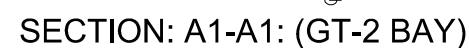
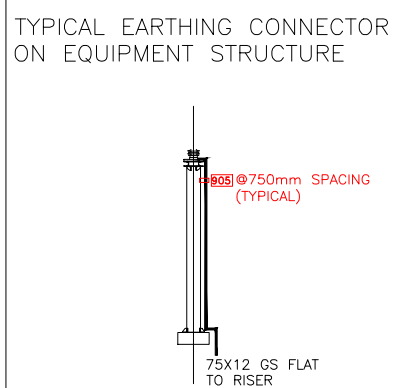
PROJECT	2X660 MW UDANGUDI SUPERCRITICAL TPS, STAGE-I
CUSTOMER	TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED (TANGEDCO)
CONSULTANT	TATA CONSULTING ENGINEERS LIMITED BENGALURU
	BHARAT HEAVY ELECTRICALS LTD TRANSMISSION BUSINESS GROUP NOIDA




JOB NO.	
STATUS	CONTRACT
DISTRIBUTION	

DEPT	BRN	NAME	SIGN	31.12.18
CODE	SY			
DESN	SS			31.12.18
CHK	SKS			31.12.18
APPD	AG			31.12.18

TITLE ERECTION KEY DIAGRAM FOR 400KV SWITCHYARD

DEPT	SCALE 1:300	DRAWING NO.
SIGN		TB-2-400-316-008
SHEET	01 OF 06	REV. 00



PROJECT		2X660 MW UDANGUDI SUPERCRITICAL TPS, STAGE-I	
CUSTOMER		 TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED (TANGEDCO)	
CONSULTANT		 TATA CONSULTING ENGINEERS' LIMITED BENGALURU	
 BHARAT HEAVY ELECTRICALS LTD TRANSMISSION BUSINESS GROUP NOIDA		DEPT CHIEF NAME SIGN DATE 31.12.18	
JOB NO. STATUS CONTRACT DISTRIBUTION		DEPT CHIEF NAME SIGN DATE 31.12.18	
REV. DATE ALTD CHD APPD		DEPT CHIEF NAME SIGN DATE 31.12.18	
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.		DEPT CHIEF NAME SIGN DATE 31.12.18	
TITLE ERECTION KEY DIAGRAM FOR 400KV SWITCHYARD		DEPT CHIEF NAME SIGN DATE 31.12.18	
SCALE 1: 300		DEPT CHIEF NAME SIGN DATE 31.12.18	
DRAWING NO. TB-2-400-316-008		DEPT CHIEF NAME SIGN DATE 31.12.18	
SHEET 02 OF 40		DEPT CHIEF NAME SIGN DATE 31.12.18	

ERECTION KEY DIAGRAM FOR 400KV SWITCHYARD**BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS**

LIST OF ABBREVIATION AND CONDUCTOR DETAILS

ABBREVIATIONS:

H:	Horizontal termination of conductor.
V:	Vertical termination of conductor.
TEH:	Expansion type connector for Al. tube.
TRH:	Rigid type connector for Al. tube.
TEH/TRH:	Connector suitable for TEH connection on one side and TRH on other side.
Sliding:	Sliding type connector for Al. tube.
2SH:	Connector for horizontal approach of stranded Twin ACSR.
2SH (THR):	Connector for horizontal approach of stranded Twin ACSR through type.
S2:	Spacer Suitable for Twin ACSR.
B:	Bimetallic sleeve to be provided in clamp.
MS:	Mild steel
MSHDG:	Mild steel hot dip galvanized
MCI/SGI:	Malleable Cast Iron/Spheroidal Graphite Iron.

CONDUCTOR DETAIL:

4"IPS Al. Tube: Outer Diameter = 114.3mm

SHIELD WIRE 7/3.66 mm: Outer Diameter = 10.98mm

ACSR MOOSE: Outer Diameter = 31.77mm

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS													
S. No.	Clamp No.	PI DESCRIPTION	Equipment	kV Rating	Current Nominal(A)	Short Circuit (kA)	Terminal				Unit	Quantity	Remarks
							Terminal Type	H/V	Material	Connector Type			
1	101	TRH Type Connector for 400kV, 2000A, 63kA for 1 Sec, GIS Bushings, Suitable for 4" IPS (EH) Al. Tube [Clamp No. 101]	GIS Bushings	400	2000	63	Stud	H	Aluminium/Copper	TRH	Nos	27	Suitable for 4" IPS Al. Tube
2	102	2SH Type Connector for 400kV, 2000A, 63kA for 1 Sec, GIS Bushings, Suitable for Twin ACSR Moose [Clamp No. 102]	GIS Bushings	400	2000	63	Stud	H	Aluminium/Copper	2SH	Nos	6	Suitable for Twin ACSR Moose
3	201	TEH/TRH Type Connector for 400kV, 2000A, 63kA for 1 Sec, Bus Post Insulator, Suitable for 4" IPS Al. Tube [Clamp No. 201]	Bus Post Insulator	400	2000	63	Pad	H	MCI/SGI	TEH/TRH	Nos	17	Suitable for 4" IPS Al. Tube
4	202	SLIDING Type Connector for 400kV, 2000A, 63kA for 1 Sec, Bus Post Insulator, Suitable for 4" IPS Al. Tube [Clamp No. 202]	Bus Post Insulator	400	2000	63	Pad	H	MCI/SGI	SLIDING	Nos	36	Suitable for 4" IPS Al. Tube
5	203	TRH Type Connector for 400kV, 2000A, 63kA for 1 Sec, Bus Post Insulator, Suitable for 4" IPS Al. Tube [Clamp No. 203]	Bus Post Insulator	400	2000	63	Pad	H	MCI/SGI	TRH	Nos	9	Suitable for 4" IPS Al. Tube
6	204	2SH(THR)Type Connector for 400kV, 2000A, 63kA for 1 Sec, Bus Post Insulator, Suitable for Twin Moose Conductor [Clamp No. 204]	Bus Post Insulator	400	2000	63	Pad	H	MCI/SGI	2SH(THR)	Nos	6	Suitable for Twin ACSR Moose
7	301*	2SH Type Connector for 400kV, 2000A, 50kA for 1 Sec, Lightning Arrester, Suitable for Twin ACSR Moose [Clamp No. 301]	Lightning Arrester	400	NA	63	Pad	H	Aluminium	2SH	Nos	33	Suitable for Twin ACSR Moose
8	401	2SH(B) Type Connector for 400kV, 2000A, 63kA for 1 Sec, Generator Transformer HV Bushing, Suitable for Twin ACSR Moose [Clamp No. 401]	Generator Transformer HV Bushing	400	2000	63	Stud	H	Copper	2SH(B)	Nos	6	Suitable for Twin ACSR Moose

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS													
S. No.	Clamp No.	PI DESCRIPTION	Equipment	kV Rating	Current Nominal(A)	Short Circuit (kA)	Terminal				Unit	Quantity	Remarks
							Terminal Type	H/V	Material	Connector Type			
9	402	2SH(B) Type Connector for 400kV, 2000A, 63kA for 1 Sec, Standby Maintainance Transformer HV Bushing, Suitable for Twin ACSR Moose [Clamp No. 402]	Standby Maintainance Transformer HV Bushing	400	2000	63	Stud	H	Copper	2SH(B)	Nos	3	Suitable for Twin ACSR Moose
10	403	2SH(B) Type Connector for 400kV,1250A, 63kA for 1 Sec, HV Bushing - Shunt Reactor, Suitable for Twin ACSR Moose[Clamp No. 403]	HV Bushing - Shunt Reactor	400	1250	63	Stud	H	Gun Metal/ Copper	2SH(B)	Nos	6	Suitable for Twin ACSR Moose
11	501	400kV, 2000A, 63kA for 1 Sec, TEE Connector, Suitable For 4" IPS Al. Tube - Through, Twin ACSR Moose - TEE [Clamp No. 501]	TEE Connector	400	2000	63	~	~	Aluminium	4" IPS Al. Tube - Through TwinACSR Moose - TEE	Nos	72	4" IPS Al. Tube - Through TwinACSR Moose - TEE
12	502	400kV, 2000A, 63kA for 1 Sec, TEE Connector, Suitable For Quad ACSR Moose - Through, Twin ACSR Moose - TEE [Clamp No. 502]	TEE Connector	400	2000	63	~	~	Aluminium	Quad ACSR Moose - Through, Twin ACSR Moose - TEE	Nos	18	Quad ACSR Moose - Through, Twin ACSR Moose - TEE
13	601	400kV, 2000A, 63kA for 1 Sec, Corona Bell, Suitable for 4" IPS Al. Tube [Clamp No.601]	Corona Bell	400	~	~	~	H	Aluminium	~	Nos	45	Suitable for 4" IPS Al. Tube
14	701	S2 type 400kV, 2000A, 63kA for 1 Sec, Spacers (Flexible), Suitable for Twin ACSR Moose [Clamp No. 701]	Spacers (Flexible)	400	2000	63	~	~	Aluminium	S2	Nos	180	Suitable for Twin ACSR Moose
15	702	S2 type 400kV, 2000A, 63kA for 1 Sec, Spacers (Rigid), Suitable for Twin ACSR Moose [Clamp No. 702]	Spacers (Rigid)	400	2000	63	~	~	Aluminium	S2	Nos	84	Suitable for Twin ACSR Moose

BILL OF QUANTITIES FOR CLAMPS AND CONNECTORS													
S. No.	Clamp No.	PI DESCRIPTION	Equipment	kV Rating	Current Nominal(A)	Short Circuit (kA)	Terminal				Unit	Quantity	Remarks
							Terminal Type	H/V	Material	Connector Type			
16	801	400kV, 2000A, 50kA for 1 Sec, Aluminium Tube - Welding Sleeves, Suitable for 4" IPS Al. Tube [Clamp No. 801]	Aluminium Tube - Welding Sleeves	~	~	~	~	H	Aluminium	~	Nos	37	Suitable for 4" IPS Al. Tube
17	901	PG Clamp For Shield Wire [Clamp No. 901]	~	~	~	~	~	~	MSHDG	~	Nos	49	Suitable for 7/3.66 mm GS Shield Wire
18	902	Clamp for Shield Wire on Structure [Clamp No. 902]	~	~	~	~	~	~	MSHDG	~	Nos	345	Suitable for 7/3.66 mm GS Shield Wire
19	903	Strain Clamp For Shield Wire [Clamp No. 903]	~	~	~	~	~	~	MSHDG	~	Nos	49	Suitable for 7/3.66 mm GS Shield Wire
20	904	Pad Connector To Suit 7/3.66mm DIA GS Wire and 75X12 mm GS Flat [Clamp No. 904]	~	~	~	~	~	~	MSHDG	~	Nos	29	Suitable for 7/3.66 mm GS Shield Wire
21	905	Clamp for Earth Strip on Structure [Clamp No. 905]	~	~	~	~	~	~	MSHDG	~	Nos	980	Suitable for GI Flat 75X12 and 50X6
22	DTT-TM	400 kV Double Tension Hardware with Turnbuckle suitable for Twin ACSR Moose Conductor	~	400	~	~	~	~	~	~	Nos	9	Suitable for Polymer type Long rod Insulator (Qty=2 No.per Hardware)
23	DT-TM	400 kV Double Tension Hardware without Turnbuckle suitable for Twin ACSR Moose Conductor	~	400	~	~	~	~	~	~	Nos	9	Suitable for Polymer type Long rod Insulator (Qty=2 No.per Hardware)
24	SSD-TM	400 kV Single Suspension Hardware with Drop Clamp suitable for Twin ACSR Moose Conductor	~	400	~	~	~	~	~	~	Nos	36	Suitable for Polymer type Long rod Insulator (Qty=2 No.per Hardware)

Note:***Supplied by equipment supplier****The equipment terminal details will be final as per approved equipment drawing and clamp will be provided suitably.**