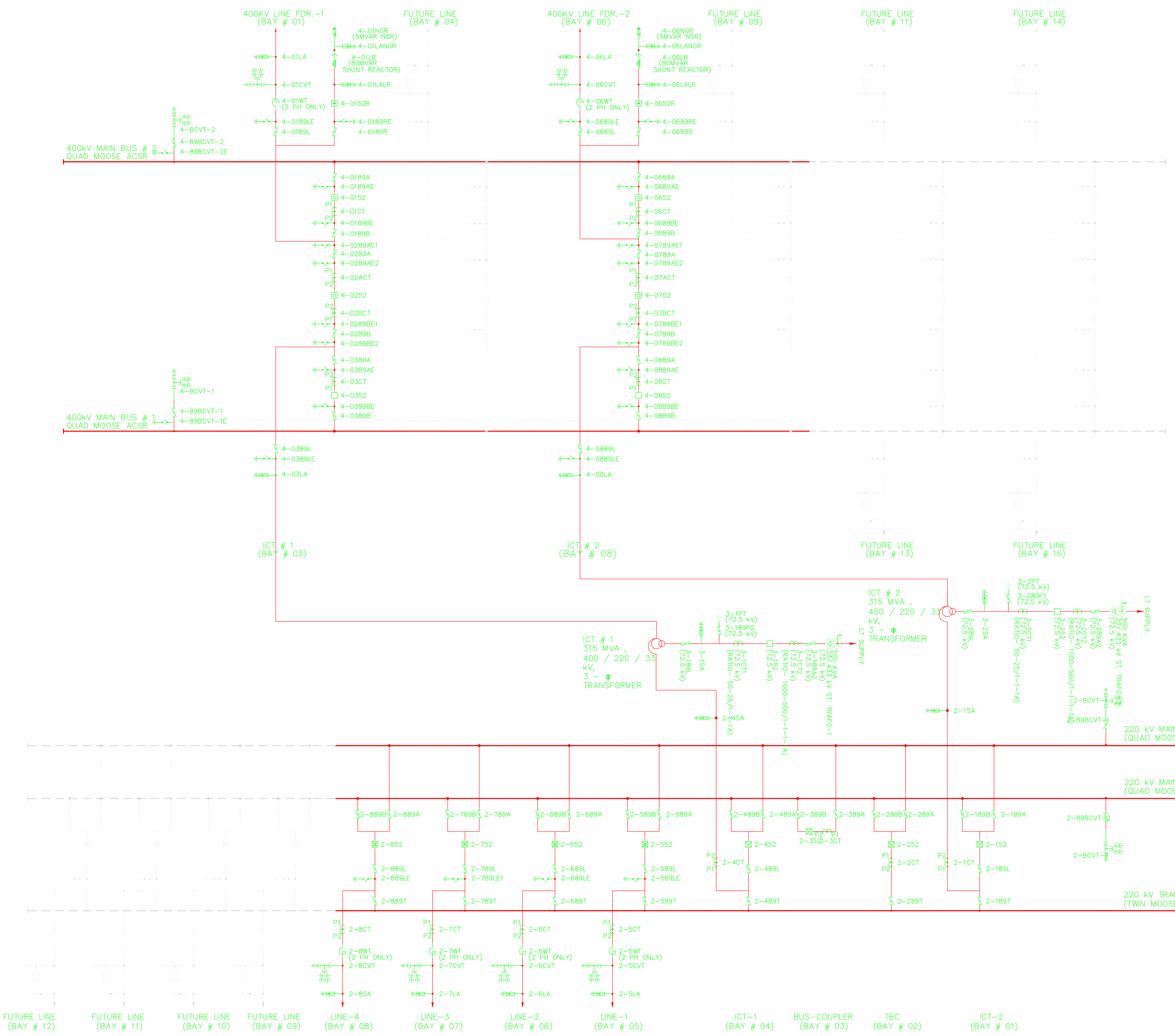
400kV Jagdalpur (CSPTCL) S/S



BILL OF QUANTITIES

Sl. No	DESCRIPTION	UNIT	QTY
	400KV SIDE EQUIPMENTS ANNEXURE - B1		
1	315MVA, 400/220/33kV AUTO TRANSFORMER WITH NFPS AND ONLINE DGA MONITORING SCHEME	Nos.	2
2	420kV, 80 MVAR 3-PHASE SHUNT REACTOR FOR LINE	Nos.	2
3	5 MVAR,145kV NGR FOR 80 MVAR REACTOR	Nos.	2
4	420kV CIRCUIT BREAKERS (3-PHASE) WITH SUPPORT STRUCTURE		
a)	2000A, 40kA FOR 3 SEC. WITH PIR (FOR CLOSING)	Sets	4
b)	2000A, 40kA FOR 3 SEC. WITHOUT PIR	Sets	2
c)	2000A, 40KA FOR 3 SEC. WITH CSD FOR REACTOR	Sets	2
5	420 kV CURRENT TRANSFORMER (1-PHASE)		
	2000A, 40KA FOR 1SEC. RATIO 2000-1000/1-1-1-1-1-1 Amp (6 CORES)	Nos.	24
6	420 kV, 8800pF,1-PHASE 400/√3/110/√3 CAPACITIVE VOLTAGE TRANSFORMER (4CORES)	Nos.	12
7	390 kV, 10 KA LIGHTNING ARRESTER (1-PHASE)	Nos.	18
8	420kV, 2000A, 40KA FOR 1SEC.,1mH WAVE TRAP	Nos.	4
9	2000A, 40kA FOR 3 SEC., ISOLATOR WITH ONE E/S	Sets	16
10	2000A, 40kA FOR 3 SEC., ISOLATOR WITH TWO E/S	Sets	4
11	120 kV, 10KA LA FOR NGR	Nos.	2
	220kV SIDE EQUIPMENTS ANNEXURE - B2		
1	245 kV CIRCUIT BREAKERS (3-PHASE)		
a)	2500A, 40kA, 3 SEC. SINGLE POLE RECLOSURE TYPE	Sets	4
b)	2500A, 40kA, 3 SEC. NORMAL DUTY TYPE	Sets	4
2	245 kV CURRENT TRANSFORMER (1-PHASE)		
	1600A, 40kA FOR 1SEC. RATIO 1600-800/1-1-1-1-1-1 Amp (6 CORES)	Nos.	24
3	245 kV, 4400pF, 1-PHASE 220/√3/110/√3CAPACITIVE VOLTAGE TRANSFORMER (4 CORES)	Nos.	18
4	198 kV, 10KA SURGE ARRESTORS (1-PHASE)	Nos.	18
5	220kV, 800A, 40KA FOR 1SEC.,0.5mH WAVE TRAP	Nos.	8
6	245kV, 2500A, 3-PHASE, 40kA FOR 3 SEC., DOUBLE BREAK ISOLATOR WITH ONE EARTH SWITCH	Nos.	4
7	245kV, 2500A, 3-PHASE, 40KA FOR 3 SEC., DOUBLE BREAK ISOLATOR WITHOUT EARTH SWITCH	Nos.	27
	33kV SIDE EQUIPMENTS ANNEXURE - B3		
1	72kV, 1250A, 25kA FOR 1 SEC.,CIRCUIT BREAKER (RATED FOR 72.5KV INSULATION CLASS)	Sets	3
2	72kV, CURRENT TRANSFORMER RATIO 50-25/1-1-1A (RATED FOR 72.5kV INSULATION CLASS)	Nos.	15
3	72kV, CURRENT TRANSFORMER RATIO 1000-500/1-1-1-1A (RATED FOR 72.5kV INSULATION CLASS)	Nos.	6 *
4	33kV POTENTIAL TRANSFORMER (1-PH.) 33kV/√3 /110V/√3 (2cores) (RATED FOR 72.5kV INSULATION CLASS	Nos.	9
5	39kV LIGHTNING ARRESTOR FOR TERTIARY WINDING(1-PH.)	Nos.	6
6	30kV LIGHTNING ARRESTOR (1-PH.)	Nos.	3
7	72.5kV 1200A HDB ISOLATOR WITHOUT EARTH SWITCH	Nos.	9
8	33/0.4 kV , 500 kVA STATION TRAFO. (WITH 72.5 kV HV SIDE INSULATION CLASS)	Nos.	3

QUANTITY MARKED (*) SHALL BE SUPPLIED AS SPARE QUANTITY.

PARAMETERS

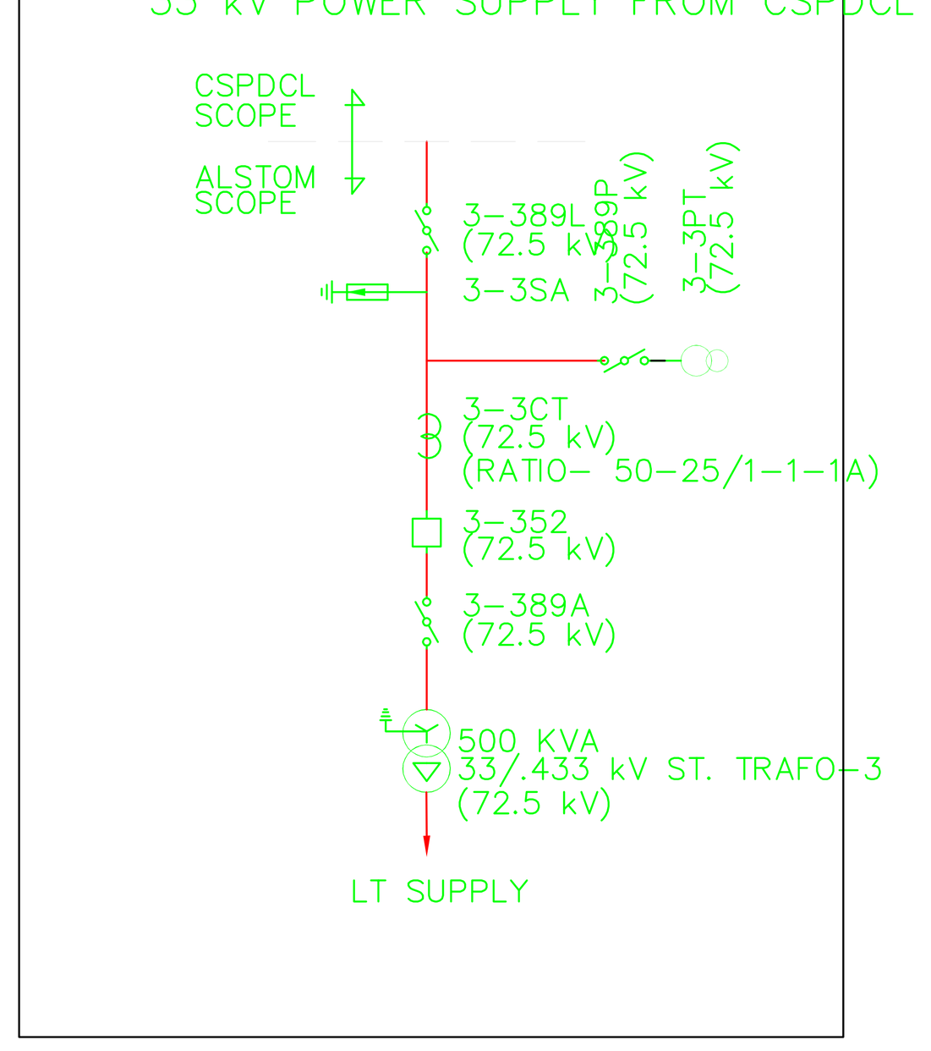
Sl.No	DESCRIPTION	SYSTEM: 400 kV SYSTEM	220 kV SYSTEM	33 kV SYSTEM (SUITABLE FOR 72.5 kV INSULATION CLASS)
1	System operating voltage	400 kV	220 kV	33 kV
2	Maximum operating voltage of the system(rms)	420 kV	245 kV	36 kV
3	Rated frequency	50 Hz	50 Hz	50 Hz
4	No. of phase	3	3	3
5	Rated Insulation levels			
5.i	Full wave impulse withstand voltage (1.2/50 microsec.)	1550 kVp	1050 kVp	325 kVp
5.ii	Switching impulse withstand voltage (250/2500 micro sec.) dry and wet	1050 kVp	–	–
5.iii	One minute power frequency dry & wet withstand voltage (rms)	630 kV	460 kV	140 kV
6	Corona extinction voltage	320 kV	156 kV	–
7	Max. radio interference voltage for frequency between 0.5 MHz and 2 MHz at 320KV rms for 400KV system and 156KV rms for 220KV system	1000 micro volt	1000 micro volt	–
8	Minimum creepage distance	25mm/KV (10500 mm)	25mm/KV (6125 mm)	25mm/KV (900 mm)
9.0	Min. clearances			
9.i	Phase to phase	4000 mm	2100 mm	320 mm
9.ii	Phase to earth	3500 mm	2100 mm	320 mm
9.iii	Sectional clearances	6500 mm	5000 mm	3000 mm
10	Rated short circuit current for 1 sec. duration	40 KA	40 KA	25 KA
11	System neutral earthing	Effectively earthed	Effectively earthed	Effectively earthed

NOMENCLATURE

X - XX - XX

- EQUIPMENT REFERENCE
- BAY NO.
- 4 - 400KV
- 2 - 220KV
- 3 - 33KV

33 kV POWER SUPPLY FROM CSPDCL



LEGEND: -

- PRESENT
- FUTURE

LEGEND	
AUTO TRANSFORMER	HDB ISOLATOR WITH 1 E/SW
CB WITH PIR	CVT
CB WITHOUT PIR	LA
CB WITH CSD	WAVE TRAP
CB RECLOSING TYPE.	REACTOR
CB GANG OPERATED	CT
HDB ISOLATOR WITH 2 E/SW	LT TRANSFORMER

REV.No.	DESCRIPTION		DRAWN	REVIEW	ELE. (CHECKED)	CIVIL (CHECKED)	MECH. (CHECKED)	APPROVED	STATUS
1	REVISED AS PER CSPTCL COMMENTS DTD.23.10.13 & AS PER DISCUSSION ON 27.09.14	Name	DS		BM			BM	FOR APPROVAL
		Date	09.01.15		09.01.15			09.01.15	
0	FIRST SUBMISSION	Name	RMD	SS	B.M			D.D	FOR APPROVAL
		Date	14.06.12	13.06.12	14.06.12			14.06.12	

REFERENCE NO.

CLIENT: CHATTISHGARH STATE POWER TRANSMISSION CO. LTD.

PROJECT: 400/220 kV SUBSTATION AT JAGDALPUR

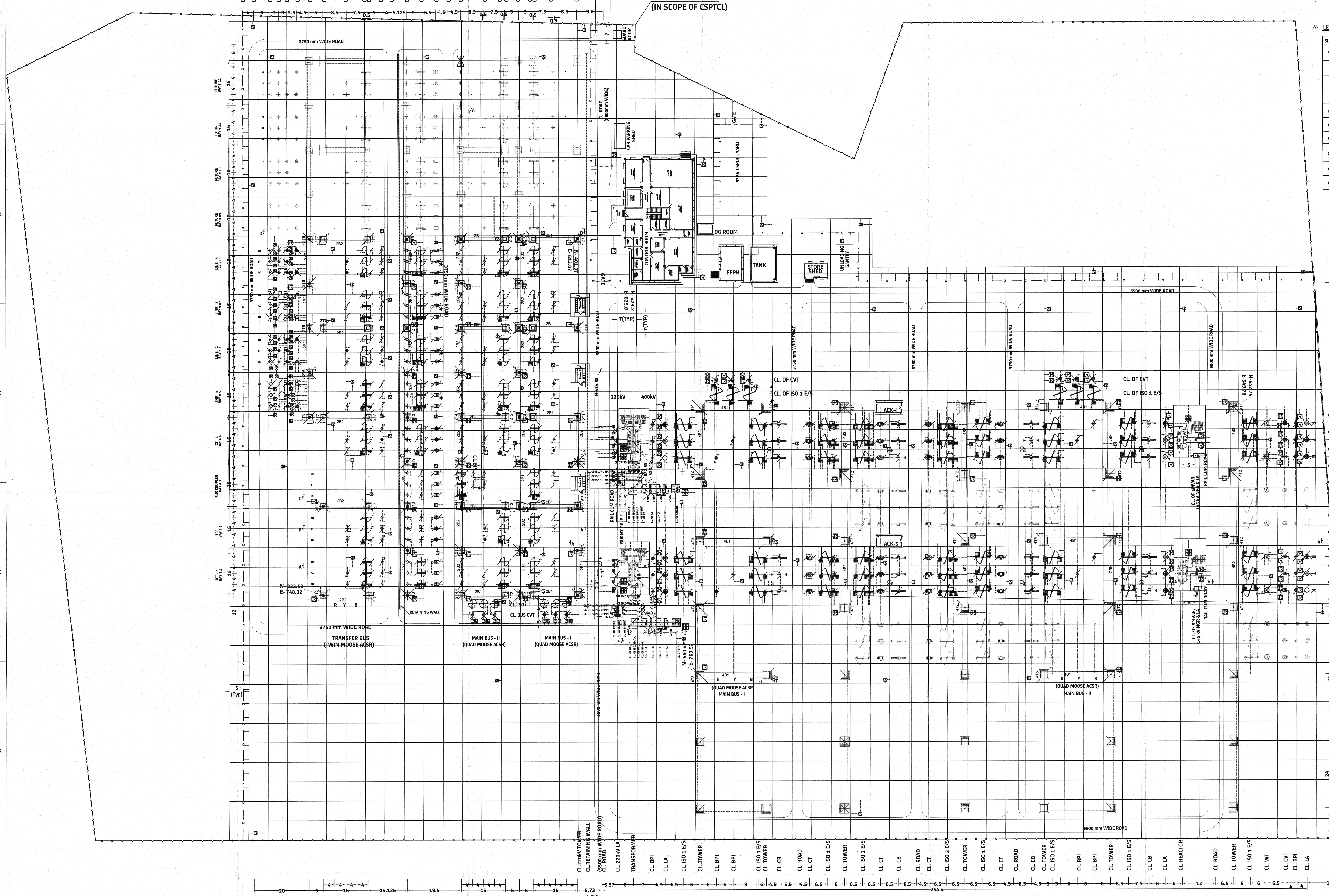
ORDER No02-04/TR-11/22/Supply/0058/Civil/0060/ETC/0062 dt 04.04.2012

TITLE: KEY SINGLE LINE DIAGRAM

A1 ALSTOM — ALSTOM T&D INDIA LTD. FORMERLY AREVA T&D INDIA LTD. DLF IT PARK, PREMISES NO.-8 MAJOR ARTERIAL ROAD TOWER-C, 8TH FLOOR, KOLKATA- 700 156.

DRAWING No.	TOTAL SH.	SH.No.	REV.
5427PK069-JDP-E-SYD-SLD-04..	01	01	1

SCALE: NTS



LEGEND:-

SI.NO	DESCRIPTION	SYMBOL	QTY.
01	40 mm DIA MS ROD FOR EARTH MAT(a+b+c)	———	39885 M
a.	40mm DIA M.S. ROD FOR MAIN MAT CONDUCTOR & RING CONDUCTOR FOR CONTROL ROOM.	———	30500 M
b.	40mm DIA M.S. ROD FOR AUX. EARTH MAT CONDUCTOR	—··—··—	1510 M
c.	40mm DIA M.S. ROD FOR EQUIPMENT & STRUCTURE EARTHING, JB EARTHING, TRANSFORMER & REACTOR EARTHING(BELOW GROUND)	———	7875 M
04.	75 x 12mm GS FLAT FOR TRANSFORMER & REACTOR EARTHING, EQUIPMENT & STRUCTURE EARTHING (ABOVE GROUND)	—··—··—	3000 M
05.	50 x 6mm GS FLAT FOR OUTDOOR JB,BMK, MB EARTHING & FENCE EARTHING (ABOVE GROUND)	— — — —	1250 M
06.	50 x 6mm MS FLAT FOR CABLE TRENCH EARTHING	—·—·—	1700 M
07.	40mm DIA 3 MTR LONG MS ROD ELECTRODE WITH UNTREATED EARTH PITS FOR LA, CVT, TOWER WITH PEAK & CONTROL ROOM CORNER	R	217 Nos.
08.	100mm DIA 3 MTR LONG G.S. PIPE ELECTRODE WITH TREATED EARTH PITS FOR TRANSFORMER & REACTOR NEUTRAL EARTHING	P	32 Nos.
09.	25 mm DIA 2.5 MTR LONG EARTH SPIKE AT GRID CORNER,NON PEAK TOWER & NEAR ISOLATOR	S	100 Nos.

NOTES:-

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. EARTHMAT, AUXILIARY MAT AND EARTH PIT LOCATION SHOWN ARE INDICATIVE ONLY. MINOR MODIFICATION IF ANY MAY BE CARRIED OUT AT SITE.
3. EVERY EQUIPMENT / STRUCTURE SHALL BE CONNECTED TO GRID AS PER EQUIPMENT EARTHING PHILOSOPHY(DRG NO:5427PK069-JDP-E-SYD-EAR-0201).
4. EARTHING CONDUCTORS SHALL BE BURIED AT 600MM BELOW GROUND LEVEL .
5. EARTHING CONNECTIONS ON EQUIPMENT TERMINALS SHALL BE OF BOLTED TYPE AND ALL THE CONNECTION SHALL BE PAINTED WITH ANTI CORROSIVE PAINT/COMPOUND.
6. CONNECTION OF EQUIPMENT WITH THE GRID SHOWN ARE INDICATIVE ONLY. EXACT LOCATION OF CONNECTIONS SHALL BE DECIDED AT SITE.
7. TAP CONNECTION FROM EARTHGRID TO THE EQUIPMENT/STRUCTURE TO BE EARTHED, SHALL BE TERMINATED ON THE EARTHING TERMINALS OF THE EQUIPMENT/STRUCTURE AS PER THE "TYPICAL EARTHING DETAILS".
8. WHEREVER EARTHING GRID INFRINGES WITH FOUNDATION, GRID CONDUCTOR SHALL BE DIVERTED SUITABLY AT SITE.
9. 50 x 6 mm. MS FLAT SHALL BE RUN ON THE TOP TIER ALL ALONG THE CABLE TRENCH AND THE SAME SHALL BE WELDED TO EACH OF THE RACKS.FURTHER THIS FLAT SHALL BE EARTHED AT BOTH ENDS AT AN INTERVAL OF 30mtrs.
10. WHEREVER EARTHING CONDUCTOR INFRINGES ACROSS CABLE TRENCH AND RAIL TRACKS IT SHALL BE LAID AT 300mm BELOW IT.
11. EARTHING CONDUCTOR CROSSING ROAD SHALL BE LAID AT 300mm BELOW ROAD OR AT GREATER DEPTH TO SUIT SITE CONDITION.
12. FOR 400KV & 220kV SWITCH YARD, 1500x1500 sq.mm. AUXILIARY EARTH MAT OF FINER MESH (300mm x 300mm) SHALL BE PROVIDED UNDER ISOLATOR MAIN SWITCH & EARTH SWITCH OPERATING MECHANISM AT A DEPTH OF 300mm BELOW GROUND LEVEL . FOR 33KV THE SIZE SHALL BE 900X900 IN PLACE OF 1500mm X1500 mm.
13. 75 X12mm G.S FLAT SHALL BE CLAMPED WITH THE EQUIPMENT SUPPORT STRUCTURES AT 1000mm INTERVAL.
14. ALL ACCESSORIES ASSOCIATED WITH TRANSFORMER LIKE COOLING BANKS, RADIATORS ETC. SHALL BE CONNECTED TO THE EARTHING GRID AT MINIMUM TWO POINTS.
15. EARTHING TERMINAL OF EACH LIGHTNING ARRESTER, POTENTIAL TRANSFORMER AND CAPACITANCE VOLTAGE TRANSFORMER SHALL BE DIRECTLY CONNECTED TO THE EARTH ELECTRODE WHICH IN TURN, SHALL BE CONNECTED TO STATION EARTHING GRID.
16. WHEREVER GRID CONDUCTOR CROSSES, THOSE CROSS POINTS ARE WELDED.
17. DISTANCE BETWEEN TWO EARTH PITS SHALL BE > 2L (L - LENGTH OF THE ROD ELECTRODE).
18. EVERY ALTERNATIVE FENCE POST SHALL BE EARTHED WITH MAIN MAT .
19. EARTHING CONDUCTOR AROUND THE BUILDING SHALL BE BURIED IN EARTH AT A MINIMUM DISTANCE OF 1500 mm FROM THE OUTER BOUNDARY OF THE BUILDING.
20. EARTHING CONDUCTOR SHALL BE BURIED 5 METER OUTSIDE THE SWITCHYARD FENCE .
21. METALLIC SHEATH & ARMOUR OF ALL MULTICORE POWER CABLES SHALL BE EARTHED AT BOTH EQUIPMENT & SWITCHGEAR END .SHEATH OF SINGLE CORE POWER CABLES SHALL BE EARTHED AT SWITCHGEAR END ONLY.
22. A LAYER OF 100mm THICK OF CRUSHER BROKEN HARD METAL OF 40mm NOMINAL SIZE SHALL BE SPREAD UNIFORMLY OVER UNDERLYING OF 100 mm STONE DUST AS PER GRAVEL LAYOUT.
23. THE FURNISHED BILL OF MATERIAL OF OUTDOOR SWITCHYARD EARTHING IS APPROXIMATED & MAY VARY DURING EXECUTION.
24. WE HAVE CONSIDERED 7MTR X 7 MTR OF MAT SPACING AS PER TECHNICAL SPECIFICATION CLAUSE NO:8.1 .
25. EARTHING DESIGN SHALL BE DONE AS PER IEEE80,IS3043 & LATEST EDITION OF INDIAN ELECTRICITY RULE

REFERENCE	
400/220kV SWITCHYARD LAYOUT PLAN DRAWING	5427PK069-JDP-E-SYD-ARR-0004.
400/220kV SWITCHYARD EARTHING DESIGN CALCULATION DOCUMENT	5427PC027-SUR-E-SYD-CAL-0106-CN.
KEY SINGLE LINE DIAGRAM	5427PK069-JDP-E-SYD-SLD-0401
400KV ELECTRICAL LAYOUT SECTION	5427PK069-JDP-E-SYD-ARR-0001
200KV ELECTRICAL LAYOUT SECTION	5427PK069-JDP-E-SYD-ARR-0002
LAND UTILIZATION PLAN	5427PK068-JDP-E-SYD-ARR-0004
SECTION DRAWING OF TERTIARY & NGR SIDE	5427PK068-JDP-E-SYD-ARR-0004 5427PK068-JDP-E-SYD-ARR-0007

DESCRIPTION

Approved subject to condition mentioned in letter No. 3831 dtd 11.03.2015

LAYOUT APPROVED SUBJECT TO CONDITION THAT :
(a) Minimum clernces as per relevant standards/ IE rules shall be maintained.
(b) Any modification required as per site condition should be carried out by the contractor as per the directives of CSPTCL'S OIC.
(C) Approval of drawing does not absolve the contractor/ supplier from the responsibility of following all the IE rules & other relevant standards.

Exe Engineer/Asstt. Engineer (S/S) O/o. CE (Trans.), CSPTCL, Raipur.
Superintending Engineer (S/S) O/o. CE (Trans.), CSPTCL, Raipur.

LEGEND

GATE
CONTROL CABINET FOR CIRCUIT BREAKER
FENCE
BOUNDARY WALL (IN SCOPE OF CSPTCL)

REV.	DESCRIPTION		DRAWN	CHECKED	APPROVED	STATUS
1	REVISED AS PER DISCUSSION WITH CSPTCL DTD:02.03.15	Name	AC	RSB	BM	APPROVAL
		Date	02.03.15	02.03.15	02.03.15	
		Sign.				
0	FIRST ISSUE	Name	AC	RSB	BM	APPROVAL
		Date	22.01.15	22.01.15	22.01.15	
		Sign.				

CLIENT:	CHATTISHGARH STATE POWER TRANSMISSION CO. LTD.
PROJECT	400/220 kV SUBSTATION AT JAGDALPUR
LOA No.	02-04/TR-11/22/Supply/0058/Civil/0060/ETC/0062 dt 04.04.2012
DRAWING TITLE	400/220kV SWITCHYARD - EARTHMAT LAYOUT

A0 ALSTOM — ALSTOM T&D INDIA LTD. FORMERLY AREVA T&D INDIA LTD. DLF IT PARK, PREMISES No.-8 MAJOR ARTERIAL ROAD TOWER-C 8TH FLOOR, KOLKATA-156.

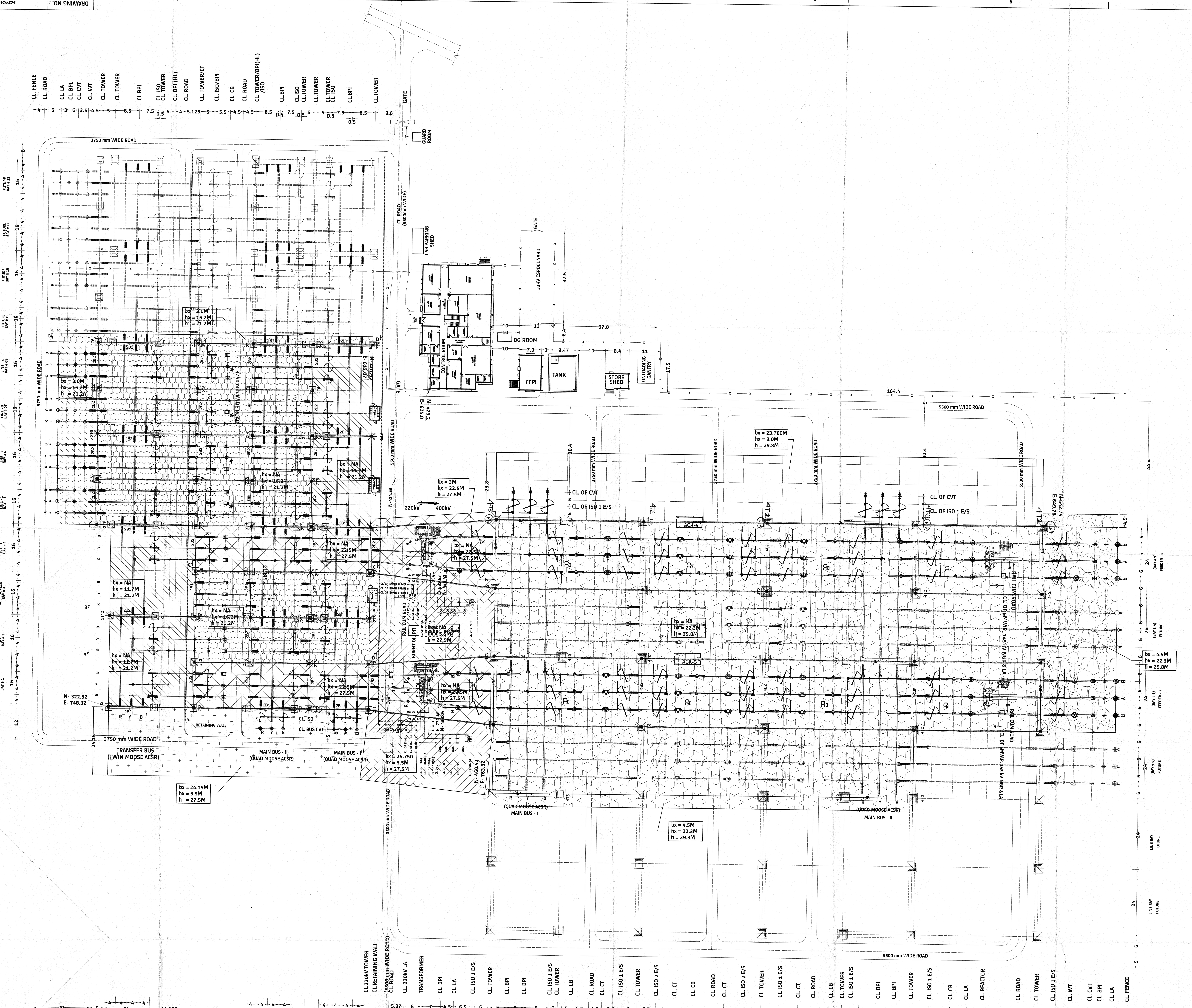
DRAWING NO.	TOTAL SH.	SCALE	SH.No.	REV.
5427PK069-JDP-E -SYD-EAR-0202	1	1:500	1 OF 1	1

LAYOUT APPROVED SUBJECT TO CONDITION THAT
(a) Minimum clernces as per relevant standards/ IE rules sh... be maintained.
(b) Any modification required as per site condition shoul... carried out by the contractor as per the directive... CSPTCL'S OIC.
(C) Approval of drawing does not absolve the contrac... supplier from the responsibility of following all the ... rules & other relevant standards.

Exe Engineer/Asstt. Engineer (S/S)
O/o. CE (Trans.), CSPTCL, Raipur.

Superintending Engineer (...
O/o. CE (Trans.), CSPTC...

Approved vide T.O. letter No. 3833 dtd 11/03/2015



LEGEND:

- ZONE OF PROTECTION FOR OBJECT OF MAXIMUM HEIGHT 16.2M (220kV JACK BUS HEIGHT AT OUTGOING GANTRY)
- ZONE OF PROTECTION FOR OBJECT OF MAXIMUM HEIGHT 22.5M (220kV JACK BUS HEIGHT AT TRANSFORMER BAY)
- ZONE OF PROTECTION FOR OBJECT OF MAXIMUM HEIGHT 11.7M (220kV MAIN BUS HEIGHT)
- ZONE OF PROTECTION FOR OBJECT OF MAXIMUM HEIGHT 5.9M (220KV BUS PT)
- ZONE OF PROTECTION FOR OBJECT OF MAXIMUM HEIGHT 5.5M (40MVA TRANSFORMER TERTIARY SIDE)
- ZONE OF PROTECTION FOR OBJECT OF MAXIMUM HEIGHT 22.3M (400kV JACK BUS HEIGHT)
- ZONE OF PROTECTION FOR OBJECT OF MAXIMUM HEIGHT 8M (400kV PT BUS HEIGHT)
- ZONE OF PROTECTION FOR OBJECT OF MAXIMUM HEIGHT 16.2M (220kV JACK BUS HEIGHT AT OUTGOING GANTRY,NOT IN ALSTOM SCOPE)
- ZONE OF PROTECTION FOR OBJECT OF MAXIMUM HEIGHT 22.3M (NOT IN ALSTOM SCOPE) (400kV JACK BUS HEIGHT)

NOTES:-

1. ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE SPECIFIED.
2. LIGHTNING PROTECTION IS ACHIVED BY PEAK TOWER & SHIELD WIRE ONLY.
3. LIGHTNING PROTECTION OF SWITCHYARD HAS BEEN DESIGNED BY USING PROF. Dr. RAZVIG'S METHOD.
4. LIGHTNING PROTECTION OF CONTROL ROOM BUILDING WILL BE SUBMITTED SEPARATELY.

ALSTOM T & D India Limited ★ RAIPUR (C.G.) ★

REFERENCE	
DSLP CALCULATION FOR OUTDOOR SWITCHYARD	DRG NO:5427PK069-JDP-E-SYD-CAL-104

REV.	DESCRIPTION		DRAWN	CHECKED	APPROVED	STATUS
0	FIRST ISSUE	Name	AC	RSB	BM/BB	APPROVAL
		Date	22.12.14	22.12.14	22.12.14	
		Sign.				

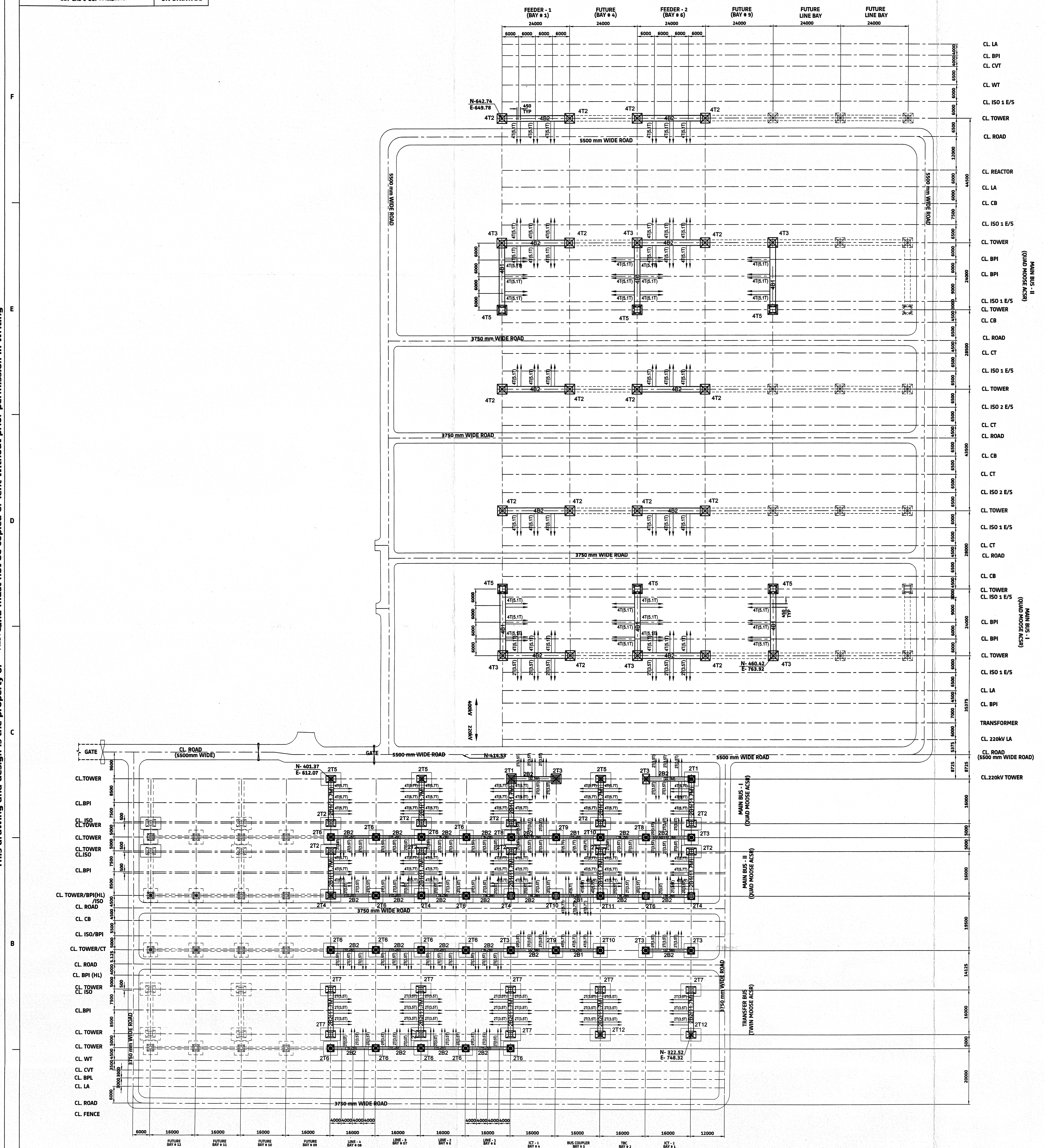
CLIENT:	CHATTISHGARH STATE POWER TRANSMISSION CO. LTD.
PROJECT	400/220 kV SUBSTATION AT JAGDALPUR
LOA No.	02-04/TR-11/22/5687 Dt. 30.03.12
DRAWING TITLE	DIRECT STROKE LIGHTNING PROTECTION LAYOUT

A0 ALSTOM — ALSTOM T&D INDIA LTD. FORMERLY AREVA T&D INDIA LTD. DLF IT PARK, PREMISES No.-8 MAJOR ARTERIAL ROAD TOWER-C 8TH FLOOR, KOLKATA-156.

DRAWING NO.	TOTAL SH.	SCALE	SH.No.	REV.
5427PK069-JDP-E-SYD-ARR-0005	1	1:500	1 OF 1	0

ALSTOM T & D India Limited ★ RAIPUR

DRAWING NO.: 5427PK069-JDP-C-SYD-ARR-1002



Only 400 KV part of Structural LayOut Plan is approved vide T.O. letter No-3832 dtd 11/03/2015

LAYOUT APPROVED SUBJECT TO CONDITION THAT :
(a) Minimum clernces as per relevant standards/ IE rules shall be maintained.
(b) Any modification required as per site condition should be carried out by the contractor as per the directives of CSPTCL'S OIC.
(C) Approval of drawing does not absolve the contractor/ supplier from the responsibility of following all the IE rules & other relevant standards.

Exe Engineer/Asstt. Engineer (S/S) O/o. CE (Trans.), CSPTCL, Raipur.
Superintending Engineer (S/S) O/o. CE (Trans.), CSPTCL, Raipur

SCHEDULE OF 400KV GANTRY COLUMN

SL. NO.	COLUMN TYPE	DETAIL	QTY.
1.	4T2	22.3 M + 7.5 M EARTH PEAK WITH PROVISIONS FOR 2 BEAMS AT 22.3 M. (SUPPORTING 4B2)	16
2.	4T3	22.3 M + 7.5 M EARTH PEAK WITH PROVISIONS FOR 3 BEAMS.TWO AT 22.3 M. & ANOTHER AT 15.3 M. (SUPPORTING 4B1 & 4B2)	06
3.	4T5	15.3 M W/O EARTH PEAK AND 1 BEAM AT 15.3M (SUPPORTING 4B1)	06

SCHEDULE OF 220KV GANTRY COLUMN

SL. NO.	COLUMN TYPE	DETAIL	QTY.
1.	2T1	22.5 M + 5 M EARTH PEAK WITH PROVISIONS FOR 2 BEAMS.ONE AT 22.5 M(2B2) & ANOTHER AT 11.7 M(2B1) WITH CONDUCTOR TENSION AT PERPENDICULAR DIRECTION.	02
2.	2T2	11.7 M. W/O EARTH PEAK AND 1 BEAM AT 11.7 M(2B1).	10
3.	2T3	22.5 M + 5 M EARTH PEAK WITH PROVISIONS FOR 2 BEAMS.ONE AT 22.5 M(2B2) & ANOTHER AT 16.2 M(2B2) WITH CONDUCTOR TENSION AT SAME DIRECTION.	06
4.	2T4	16.2 M + 5 M EARTH PEAK WITH PROVISIONS FOR 3 BEAMS. TWO AT 16.2 M(2B2) & ANOTHER AT 11.7 M(2B1) WITH CONDUCTOR TENSION AT PERPENDICULAR DIRECTION. 2 NOS. EARTH PEAK REQUIRED AMONG 4 NOS.	04
5.	2T5	16.2 M. +5 M. EARTH PEAK WITH PROVISION FOR 1 BEAM AT 11.7 M(2B1).	03
6.	2T6	16.2 M. +5 M. EARTH PEAK WITH PROVISION FOR 2 BEAMS AT 16.2 M(2B2) WITH CONDUCTOR TENSION AT SAME DIRECTION. 15NOS EARTH PEAK REQUIRED AMONG 16 NOS.	16
7.	2T7	11.7 M. W/O EARTH PEAK AND 1 BEAM AT 11.7 M(2B2).	08
8.	2T8	22.5 M + 5 M EARTH PEAK WITH PROVISIONS FOR 3 BEAMS.TWO AT 16.2 M(2B2) & ANOTHER AT 22.5 M(2B2) WITH CONDUCTOR TENSION AT SAME DIRECTION.	02
9.	2T9	22.5 M + 5 M EARTH PEAK WITH PROVISIONS FOR 3 BEAMS.ONE AT 16.2 M(2B2),ONE AT 16.2M(2B1) & ANOTHER AT 22.5 M(2B2) WITH CONDUCTOR TENSION AT SAME DIRECTION.	02
10.	2T10	16.2 M + 5 M EARTH PEAK WITH PROVISIONS FOR 2 BEAMS.ONE AT 16.2 M(2B2) & ANOTHER AT 16.2 M(2B1) WITH CONDUCTOR TENSION AT SAME DIRECTION. 2 NOS EARTH PEAK REQUIRED AMONG 3 NOS.	03
11.	2T11	16.2 M + 5 M EARTH PEAK WITH PROVISIONS FOR 3 BEAMS.ONE AT 16.2 M(2B2),ONE AT 16.2M(2B1) & ANOTHER AT 11.7 M(2B1) WITH CONDUCTOR TENSION AT PERPENDICULAR DIRECTION.	01
12.	2T12	16.2 M. +5 M. EARTH PEAK WITH PROVISION FOR 1 BEAM AT 11.7 M(2B2)	02

SCHEDULE OF 400KV GANTRY BEAM

SL. NO.	BEAM TYPE	DETAIL	ANCHORING DISTANCE	QTY.	NO. OF ANCHORING POINT ON BEAM FOR TENSION INSULATOR	NO. OF ANCHORING POINT ON BEAM FOR SUSPENSION INSULATOR
1.	4B1	BEAM AT 15.3 M HEIGHT. SPAN 24 M.	FOR TENSION 6000 6000 6000 6000 / 6000 6000 6000 6000 FOR SUSPENSION	06	2 Nos./PHASE	1 Nos./PHASE
2.	4B2	BEAM AT 22.3 M HEIGHT. SPAN 24 M.	FOR TENSION 6000 6000 6000 6000 / 6000 6000 6000 6000 FOR SUSPENSION	10	2 Nos./PHASE	1 Nos./PHASE

SCHEDULE OF 220KV GANTRY BEAM

SL. NO.	BEAM TYPE	DETAIL	ANCHORING DISTANCE	QTY.	NO. OF ANCHORING POINT ON BEAM FOR TENSION INSULATOR	NO. OF ANCHORING POINT ON BEAM FOR SUSPENSION INSULATOR
1.	2B1	BEAM AT 11.7 M & 16.2 M HEIGHT. SPAN 16 M & 4T(5.7T) FORCE	FOR TENSION 4000 4000 4000 4000 / 4000 4000 4000 4000 FOR SUSPENSION	13	2 Nos./PHASE	1 Nos./PHASE
2.	2B2	BEAM AT 11.7 M,16.2 M & 22.5 M. HEIGHT. SPAN 16 M & 2T(3.5T) FORCE	FOR TENSION 4000 4000 4000 4000 / 4000 4000 4000 4000 FOR SUSPENSION	31	2 Nos./PHASE	1 Nos./PHASE

GENERAL NOTES :-

1. FORCE SHOWN WITHIN BRACKET IS SHORT CIRCUIT FORCE AND OUTSIDE BRACKET IS NORMAL FORCE.
2. ALL DIMENSIONS ARE IN 'MM' UNLESS NOTED OTHERWISE.
3. THE EARTH WIRE TENSION SHALL BE CONSIDERED AS 0.8T FOR DESIGN PURPOSE.

REFERENCE DRAWING :-

1. 400/220 KV LAND UTILIZATION PLAN 5427PK069-JDP-E-SYD-ARR-0004 REV.-2
2. 400 KV ELECTRICAL PLAN LAYOUT & SECTION 5427PK069-JDP-E-SYD-ARR-0001 REV.-2
3. 220 KV ELECTRICAL PLAN LAYOUT & SECTION 5427PK069-JDP-E-SYD-ARR-0002 REV.-2

ALSTOM T&D India Limited ★ RAIPUR (C.G.) ★

LEGEND:-
DOUBLE TENSION / DOUBLE ANCHORING
SINGLE TENSION / SINGLE ANCHORING
PRESENT SCOPE
FUTURE SCOPE
TOWER WITHOUT PEAK
TOWER WITH PEAK
TOWER WITH FUTURE SCOPE

REV.	DESCRIPTION		DRAWN	CHECKED	APPROVED	STATUS
2	REVISED AS PER DISCUSSION WITH CSPTCL	Name	NP	SP	BB	APPROVAL
		Date	28.02.15	28.02.15	28.02.15	
1	220 KV PORTION IS ADDED	Name	NP	SP/RB	BB	APPROVAL
		Date	07.11.14	07.11.14	07.11.14	
0	SUBMISSION FOR APPROVAL	Name	NP	SP/RB	BB	APPROVAL
		Date	07.10.14	08.10.14	08.10.14	

REFERENCE | DESCRIPTION | LEGEND

CLIENT: CHATTISHGARH STATE POWER TRANSMISSION CO. LTD.

PROJECT: 400/220 kV SUBSTATION AT JAGDALPUR

LOA No.: 02-04/TR-11/22/5687 Dt. 30.03.12

DRAWING TITLE: STRUCTURAL LAYOUT PLAN FOR 400/220 KV

A0 ALSTOM — ALSTOM T&D INDIA LTD. FORMERLY AREVA T&D INDIA LTD. DLF IT PARK, PREMISES No.-8 MAJOR ARTERIAL ROAD TOWER-C 8TH FLOOR, KOLKATA-156.

DRAWING NO.: 5427PK069-JDP-C-SYD-ARR-1002 | TOTAL SH.: 1 | SCALE: 1:500 | SH.No.: 1 OF 1 | REV.: 2

DF008

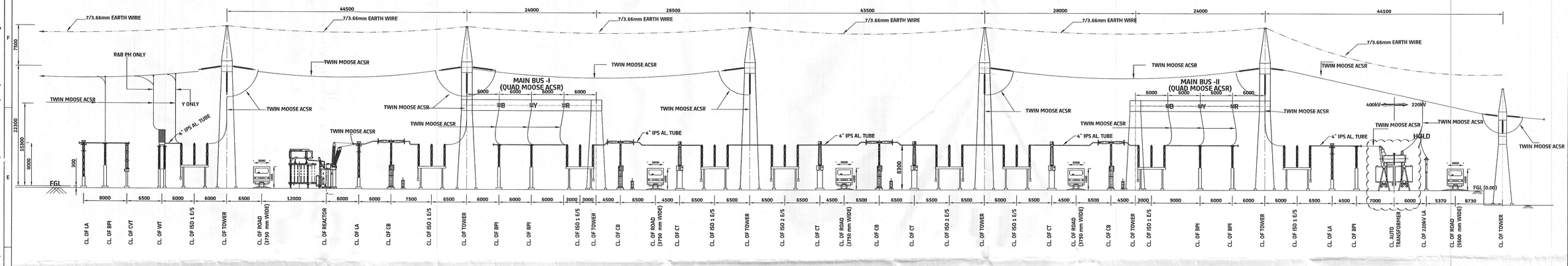
DRAWING No. 5427PK069-JDP-E-SYD-ARR-0001

Approved subject to condition mentioned in letter No. 1713 dtd 27.09.2024.

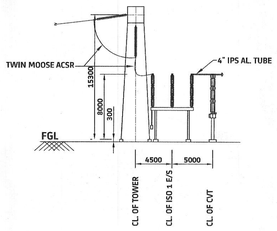
LAYOUT APPROVED SUBJECT TO CONDITION THAT :
(a) Minimum clernces as per relevant standards/ IE rules shall be maintained.
(b) Any modification required as per site condition should be carried out by the contractor as per the directives of CSPTCL's OIC.
(C) Approval of drawing does not absolve the contractor/ supplier from the responsibility of following all the IE rules & other relevant standards.

Exe Engineer/Assst. Engineer (S/S) O/o. CE (Trans.), CSPTCL, Raipur.

Superintending Engineer (S/S) O/o. CE (Trans.), CSPTCL, Raipur.



SECTION A - A
(LINE -REACTOR-TIE-BUS ICT BAY)



SECTION B - B
(BUS CVT CONNECTION)

NOTES:-

1- ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
2- THE PARAMETERS FOR WHICH THE SAME IS DESIGNED :

DESCRIPTION	VALUE
NOMINAL SYSTEM VOLTAGE (kV)	400
HIGHEST SYSTEM VOLTAGE (kV)	420
IMPULSE WITHSTAND VOLTAGE(kVp)	1550
P.F WITHSTAND VOLTAGE (V rms)	1050
CREEPAGE DISTANCE (mm)	10500
SHORT CIRCUIT CURRENT (KA)	40
DURATION (s)	1

3- SYSTEM OF NEUTRAL EARTHING — EFFECTIVELY EARTHED

4- MINIMUM CLEARANCE ADOPTED

PHASE TO EARTH	3500
PHASE TO PHASE	4000
SECTIONAL CLEARENCE	6500

5- HEIGHTS

PLINTH HT.	GROUND CLEARANCE	HT OF C.L. OF PIPE BUS FROM PL	PH-PH DIST JACK BUS	PH-PH DIST MAIN BUS	PH-PH DIST EQUIPMENT LEVEL	JACK BUS HEIGHT	MAIN BUS HEIGHT
300	2440	8000	6000	6000	6000	22300	15300

5- CONDUCTOR SIZE/ DETAIL :
EQUIPMENT CONNECTIONS — EQUIPMENT DROPPER — MAIN BUS — TRANSFER BUS
4 " IPS ALUMINUM TUBE — TWIN /QUAD MOOSE — QUAD MOOSE — TWIN MOOSE

6- LEVEL DIFFERENCE IF ANY BETWEEN SWITCHYARD WILL BE FINALIZED SEPARATELY.
7. ALL DIMENSION ARE IN MM UNLESS OTHERWISE SPECIFIED.
10. WT SHALL BE INSTALLED ONLY IN TWO PHASE & SAME SHALL BE CONFIRMED BY CLIENT.
11. LOCATION OF TRANSFORMER ,LIVE REACTOR & BUS REACTOR ARE KEPT UNDER HOLD AND SHALL BE FINALISED AFTER FINALIZATION OF GA DRAWING.
12. CLEARANCE DIAGRAM WILL BE SUBMITTED SEPARATELY.

REV.No.	DESCRIPTION	DATE	DRAWN	REVIEW	CHECKED			APPROVED	STATUS
					ELE.	CIVIL	MECH.		
1	REVISED AS PER CSPTCL LETTER REF.02-04/SSI/TR-11/22/NO 1817 DTD. 11.09.2014	Name			RSB			RSB/BM	FOR APPROVAL
		Date	23.09.14		23.09.14			23.09.14	
		Sign.							
0	FIRST ISSUE	Name	RMD	RMD	SS			BM	FOR APPROVAL
		Date	17.09.12	17.09.12	19.09.12			19.09.12	
		Sign.							

REFERENCE NO. | DESCRIPTION | LEGEND

CLIENT: CHATTISHGARH STATE POWER TRANSMISSION CO. LTD.

PROJECT: 400/220 kV SUBSTATION AT JAGDALPUR

LOA No. 02-04/TR-11/22/5687 Dt. 30.03.12

TITLE: 400 kV ELECTRICAL LAYOUT PLAN & SECTION (400kV SIDE)

A1 | ALSTOM T&D INDIA LTD. (FORMERLY AREVA T&D INDIA LTD.) DLF IT PARK, PREMISES NO.-8 MAJOR ARTERIAL ROAD TOWER-C, 8TH FLOOR, KOLKATA- 700 156.

DRAWING No. 5427PK069-JDP-E-SYD-ARR-0001 | TOTAL SH. 1 | SH.No. 1 | REV. 2

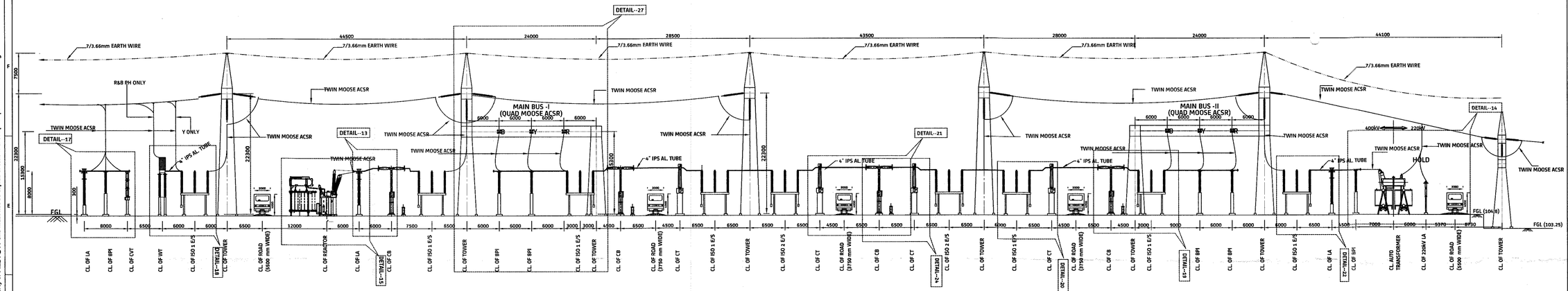
SCALE 1:350 | 1 OF 1

DRAWING No. 5427PK069-JDP-E-SYD-ARR-0003

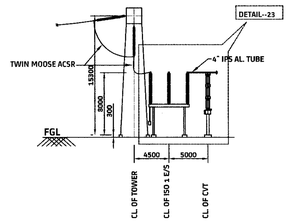
Remark
Approved subject to condition that 1. 400 KV clearance diagram (on sheet No. 22) for LA to BPI to CVT- The No. of solid core insulators may be increased thereby decreasing the height of support structure of BPI in order to obtain necessary clearance. 2. The clearance of 220 KV CT from the Gantry Tower is shown to be less than 2.1 meter for phase to ground clearance (Sheet No 12). You are requested to clarify on this. If required, all the CTs may be shifted one meter or more towards Main bus II in order to achieve the required clearance.

This drawing/document is approved for on-going turnkey project viz. construction of 400/220 KV Substation, Jagdalpur, subject to conditions mentioned in
T.O. letter No. 587 ..... Dtd. 22/01/15
Conveying approval of the drawing/document. further, following conditions shall also be applicable;
1. Approval of the drawing/document dose not absolve the contractor from responsibility of providing material as per our tender specification & no deviation shall be allowed.
2. If any shortcoming is found at a later stage, the material shall be liable for rejection.

A.E.(S/S) E.E.(S/S) S.E.(S/S)
Office of ED/CE(Transmission), CSPDCL, Raipur



SECTION A - A
(LINE -REACTOR-TIE-BUS ICT BAY)



SECTION B - B
(BUS CVT CONNECTION)

REFERENCE NO.	DESCRIPTION	LEGEND

REV.No.	DESCRIPTION		DATE	DRAWN	REVIEW	CHECKED ELE.	CHECKED CIVIL	CHECKED MECH.	APPROVED	STATUS
		Name								
		Date								
		Sign.								
		Name								
		Date								
		Sign.								
2	REVISED AS PER CSPTCL COMMENTS DTD:07/05/2015	Name	AC		RSB			BM		FOR APPROVAL
		Date	11.05.15		11.05.15			11.05.15		
		Sign.								
1	REVISED AS PER CUSTOMER COMMENTS DTD. 14.04.15	Name	AC		RSB			BM		FOR APPROVAL
		Date	20.04.15		20.04.15			20.04.15		
		Sign.								
0	FIRST ISSUE	Name	RMD	RMD	SS			BM		FOR APPROVAL
		Date	13.03.15	17.09.12	13.03.15			13.03.15		
		Sign.								

CLIENT: CHATTISHGARH STATE POWER TRANSMISSION CO. LTD.

PROJECT: 400/220 kV SUBSTATION AT JAGDALPUR

LOA No. 02-04/TR-11/22/Supply/0058/Civil/0060/ETC/0062 dt 04.04.2012

TITLE: ANNEXTURE-2(400 KV SECTION)

A1

ALSTOM T&D INDIA LTD.
(FORMERLY AREVA T&D INDIA LTD.)
DLF IT PARK, PREMISES NO.-8
MAJOR ARTERIAL ROAD TOWER-C,
8TH FLOOR, KOLKATA- 700 156.

DRAWING No. 5427PK069-JDP-E-SYD-ARR-0003

TOTAL SH. 1 | SH.No. 1 | REV. 2

SCALE 1:350