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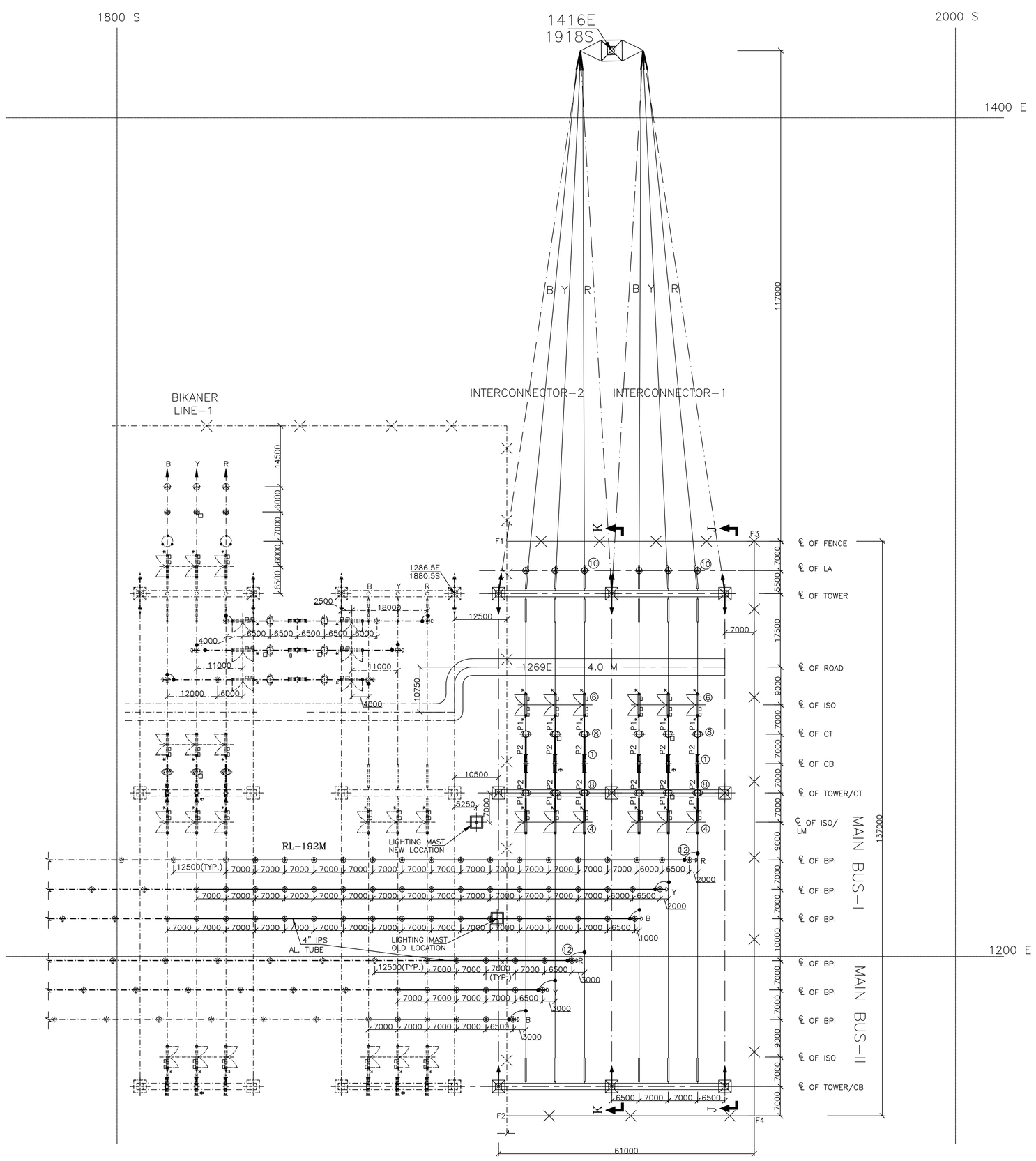
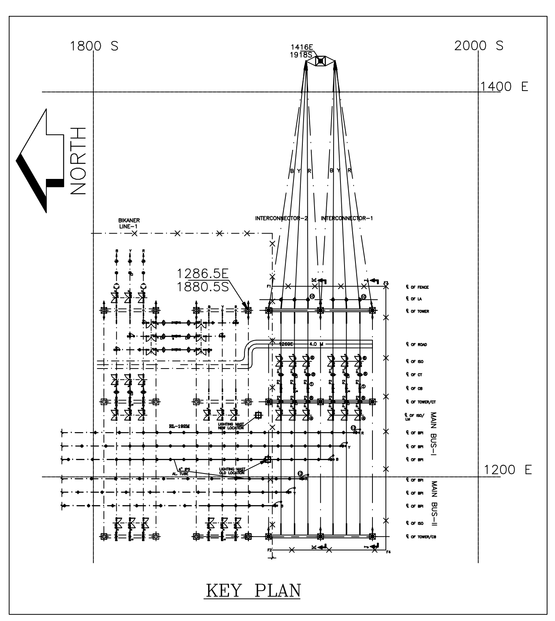
FIRST ANGLE PROJECTION

DRG. NO. TB-0-360-316-002



LAYOUT PLAN OF UNIT–6 EXTENSION 420kV SWITCHYARD



KEY PLAN

SCHEDULE OF EQUIPMENT (OUTDOOR)			QUANTITY IN NOS.	
ITEM CODE	DESCRIPTION	SYMBOLS	UNIT 7&8 SWITCHYARD	UNIT 6 EXTN. SWITCHYARD
1.	420kV, 3150A, 3–PHASE, 50 kA FOR 3 Sec. SF6 CIRCUIT BREAKERS WITHOUT CLOSING RESISTOR SUITABLE FOR SINGLE AND 3–PHASE OPERATION.		6	2
2.	420kV, 3150A, 3–PHASE, 50 kA FOR 3 Sec. SF6 CIRCUIT BREAKERS WITH CLOSING RESISTOR SUITABLE FOR SINGLE AND 3–PHASE OPERATION.		6	–
3	420kV, 3150A, 3–PHASE, 50 kA FOR 3 Sec. SF6 CIRCUIT BREAKERS WITHOUT CLOSING RESISTOR WITH CONTROLLED SWITCHING DEVICE SUITABLE FOR SINGLE AND 3–PHASE OPERATION.		7	–
4	420kV, 3150A 3–PHASE, 50 kA FOR 3 Sec. HCB ISOLATOR (ELECTRICALLY GANGED MOTOR OPERATED) WITH ONE E/S ON RIGHT SIDE (MANUALLY OPERATED)		23	2
5	420kV, 3150A 3–PHASE, 50 kA FOR 3 Sec. HCB ISOLATOR (ELECTRICALLY GANGED MOTOR OPERATED) WITH ONE E/S ON LEFT SIDE (MANUALLY OPERATED)		17	–
6	420kV, 3150A 3–PHASE, 50 kA FOR 3 Sec. HCB ISOLATOR (ELECTRICALLY GANGED MOTOR OPERATED) WITH TWO E/S (MANUALLY OPERATED)		8	2
7	420kV, 3000A, 50kA FOR 3 Sec. 1–PHASE, 6 CORE CURRENT TRANSFORMER		54	–
8	420kV, 3000A, 50kA FOR 3 Sec. 1–PHASE, 3 CORE CURRENT TRANSFORMER		24	12
9	420kV, 4400 pF, $\frac{400}{\sqrt{3}}/\frac{0.110}{\sqrt{3}}/\frac{0.110}{\sqrt{3}}/\frac{0.110kV}{\sqrt{3}}/\frac{0.110kV}{\sqrt{3}}$, 1–PHASE , 4 CORE CAPACITOR VOLTAGE TRANSFORMER		26	0
10	390kV, 1–PHASE LIGHTNING ARRESTERS,20KA,CLASS–5		42	6
11	420kV, 3150A, 1mH, 1–PHASE WAVE TRAP 50 kA FOR 1 Sec.		8	–
12	420kV, 1–PHASE BUS POST INSULATOR		186	63
13	420kV, 80MVAR, 3–PHASE LINE SHUNT REACTOR		02	–
14	420kV, 50MVAR, 3–PHASE LINE SHUNT REACTOR		02	–
15	420kV, 125MVAR, 3–PHASE BUS SHUNT REACTOR		02	–
16	120kV, 1–PHASE LIGHTNING ARRESTERS,10KA,CLASS–3		04	–
17	145kV NGR(60 KVAR, 600 ohm) FOR BABAI LINE REACTOR		02	–
18	145kV NGR FOR BIKANER LINE REACTOR		02	– #

NGR RATING SHALL BE CONFIRMED BY CUSTOMER

NOTE :–

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
2. SYSTEM PARAMETERS

S. NOS.	DESCRIPTION	UNIT	
1.	NOMINAL SYSTEM VOLTAGE	kV	400
2.	HIGHEST SYSTEM VOLTAGE	kV	420
3.	BASIC IMPULSE LEVEL	kVP	1425
4.	POWER FREQUENCY WITHSTAND	kVrms	630
5.	SWITCHING IMPULSE WITHSTAND VOLTAGE	kVrms	1050
6.	CREEPAGE DISTANCE (MINIMUM)	mm/kV	31
7.	SYSTEM FAULT LEVEL FOR 3 SEC	kA	50

3. CONDUCTOR DETAIL

S. NOS.	DESCRIPTION	UNIT 6 EXTN. SWITCHYARD	UNIT 7&8 SWITCHYARD
1.	MAIN BUS	4"IPS (EXTRA HEAVY DUTY) Al. TUBE OD=114.20mm ID=97.18mm	4.5"IPS (EXTRA HEAVY DUTY) Al. TUBE OD=127mm ID=108.967mm
2.	EQUIPMENT INTERCONNECTION	4.5"IPS (EXTRA HEAVY DUTY) Al. TUBE/TWIN/ QUAD MOOSE ACSR	4.5"IPS (EXTRA HEAVY DUTY) Al. TUBE/TWIN/ QUAD MOOSE ACSR
3.	JUMPER /DROPPERS	TWIN/QUAD MOOSE ACSR	TWIN/QUAD MOOSE ACSR
4.	SHIELD WIRE	7/4.06 (7/8 SWG) GALVANISED STEEL (12.2mm DIA)	7/4.06 (7/8 SWG) GALVANISED STEEL (12.2mm DIA)

4. ALL THE BUS BARS AND STRUNG BUSES ARE PROTECTED FROM 7/4.06 GALVANISED STEEL WIRE.
5. DURING ERECTION, 3 NOS. FOUNDATIONS FOR WAVE TRAP IN EACH FEEDER BAY OF 400kV SWITCHYARD TO BE CASTED. ONLY 2 NOS. WAVE TRAP PER FEEDER BAY WILL BE UTILISED DURING COMMISSIONING AS PER PLCC REQUIREMENT AND AFTER NECESSARY TESTING.
6. SUPPLY AND STRINGING OF BIKANER & BABAI LINE CONDUCTOR, SHIELD WIRE, INSULATOR AND HARDWARE BETWEEN DEAD END TOWER AND SUBSTATION TERMINAL GANTRY ARE NOT IN BHEL SCOPE. HOWEVER, JUMPERING FOR THE RESPECTIVE EQUIPMENT SHIELDING REQUIREMENT FOR PROTECTION OF LIVE EQUIPMENT, JUMPERS & HARDWARE REQUIRED FOR JUMPERS ARE IN SCOPE OF BHEL.
7. ROAD INSIDE SWITCHYARD FENCE, & APPROACH ROAD TO SWITCHYARD FROM POWER PLANT ROAD SHALL BE IN TBG SCOPE.
8. ALL SWITCHYARD EQUIPMENTS & TOWER STRCTURE SHALL BE LATTICE TYPE.
9. THE TOP OF THE BOLT OF LA (COMING IN TRANSFORMER YARD) FOUNDATION SHALL BE LOWER BY 150MM THAN THE TOP OF RAIL, THIS IS TO FACILITATE THE REMOVAL OF LA STRUCTURE DURING TRANSFORMER TO BE TAKEN OUT FOR REPAIR/ REPLACEMENT.
10. REFER PLOT PLAN FOR MAIN ROAD OUTSIDE OF SWITCHYARD.
11. SEPARATE DRAWING SHALL BE REFERRED FOR ERECTION KEY DIAGRAM, TRENCH LAYOUT, EARTHMAT LAYOUT, CONTROL ROOM, TOWER/ BEAM, FIRE FIGHTING SYSTEM, ILLUMINATION SYSTEM, AIR CONDITIONING & VENTILATION SYSTEM, FENCE, GATE, GRAVEL ETC.
12. RL OF UNIT 6 EXTENTION SWITCHYARD IS RL–192MTR. FGL RL OF UNIT 7 & 8 SWITCHYARD IS 193.0 MTR. FFL/PAVING LEVEL OF TRANSFORMER YARD IS 193.4MTR. FGL OF TRANSFORMER YARD IS 193.0MTR.
13. STATIC TENSION ON THE BUSES AND SHIELD WIRE SHALL BE SHOWN IN THE STRUCTURE LOADING DAIGRAM SEPARATELY.
14. EXISTING FENCE BETWEEN F1–F2 SHALL BE DISMANTLED BY BHEL & DISMENTALED FENCE SHALL BE USED BY RUVNL. NEW FENCE BETWEEN F1–F3, F3–F4 & F4–F2 WILL BE PROVIDED BY BHEL.
15. SIZE OF CONTROL BUILDING IS TENTATIVE & SAME SHALL BE FINALIZED AFTER THE APPROVAL OF CONTROL BUILDING DRAWING.
16. SPACING OF SPACER CLAMP WILL BE 4MTR. FOR ALL QUAD,/TWIN SPAN.
17. LOCATION OF DEAD END TOWER OF OUTGOING LINE SHALL BE DECIDED JOINTLY BY BHEL & CUSTOMER.
18. SEPARATE DRAWING SHALL BE REFERRED FOR 11kV SWITCHYARD (DRAWING NO. TB–3–360–316–016) & 420kV INTERCONNECTING LINE (DRAWING NO. TB–0–360–316–017).
19. THE ROAD TURNING FOR LOCATION MARKED WITH RT1 SHALL BE TO SUIT TO AND FRO MOVEMENT OF TRAILOR CARRYING 80/50 MVAR LINE REACTOR.
20. NEUTRAL GROUNDING REACTOR OF LINE REACTOR WILL BE MOUNTED ON STRUCTURE OF MINIMUM HEIGHT OF 2.5 MTR.
21. LOCATION OF DEAD END TRANSMISSION LINE SHALL BE DECIDED JOINTELY BY BHEL & CUSTOMER.

LEGEND TABLE

	PRESENT BHEL SCOPE OF SUPPLY
	EXISTING
	CUSTOMER SCOPE
	SHIELD WIRE
	FENCE
	TENSION STRING INSULATOR
	SUSPENSION STRING INSULATOR
	COLUMN WITH PEAK
	CORONA END BELL
	TUBE
	CONDUCTOR
	RAIL

REFERENCE

1. SINGLE LINE DIAGRAM FOR 400 kV SURATGARH SUBSTATION – DRG. TB–1–360–510–001
2. PLOT PLAN DRAWING NO. PE–DG–392–100–M001
3. LAYOUT OF TRANSFORMER YARD DRAWING NO. PE–DG–392–100–E001
4. 400kV SWITCHYARD LAYOUT PLAN & SECTION DRAWING NO. TCE.5750A–739–GA–3011,P4
5. 400/220kV SWITCHYARD LAYOUT PLAN OF UNIT–6 DRAWING NO. 3VYN191103
6. SWITCHYARD CONTROL ROOM DRAWING NO. TB–3–360–316–009
7. LAYOUT & ELEVATION OF 11kV S/S DRAWING NO. TB–3–360–316–016
8. LAYOUT & ELEVATION OF INTERCONNECTION LINE DRAWING NO. TB–0–360–316–017
9. ELECTRICAL CLEARENCE DIAGRAM DRAWING NO. TB–3–360–316–015
10. TRENCH LAYOUT OUTDOOR S/S DRAWING NO. TB–0–360–316–005
11. EARTHMAT LAYOUT DRAWING NO. TB–0–360–316–007
12. ERECTION KEY DIAGRAM OF S/S DRAWING NO. TB–3–360–316–006
13. STRUCTURE LOADING DIAGRAM DRAWING NO. TB–0–360–316–010

REV.	DATE	REASONS FOR REVISION	DRN.	PREPARED BY	CHECKED BY	APPROVED BY
03	13.08.14	AS PER TCE LETTER DATED 27.02.14	RK	SK	SKS	RS
02	05.02.14	AS PER TCE LETTER DATED 29.11.13	RK	SK –SD–	SKS–SD–	RS –SD–
01	04.10.13	AS PER TCE LETTER DATED 16.09.13	RK	SK –SD–	SKS –SD–	RS –SD–

OWNER

RAJASTHAN RAJYA VIDYUT UTPANDAN NIGAM LIMITED

PROJECT

2X660MW THERMAL POWER PLANT,SURAT GARH STAGE -V, UNIT 7 & 8 AT SURATGARH , RAJASTHAN

OWNER'S ENGINEER

TATA CONSULTING ENGINEERS LIMITED

EPC CONTRACTOR

BHARAT HEAVY ELECTRICALS LTD TRANSMISSION BUSINESS GROUP

DEPT CODE		NAME	SIGN.	DATE
422	DRN	RK	–SD–	05.08.13
	DESN	SK	–SD–	
	CHD	SKS	–SD–	
	APPD	SS	–SD–	

TITLE

LAYOUT PLAN FOR 400kV S/S AT SURATGARH

CV	ME	EL	I&C			DEPT.	SCALE 1:600	BHEL/SUB VENDOR DRG NO. TB-0-360-316-002
						SIGN		
						DATE		SHT. No 01 OF 02 REV. 03

COMPUTER FILE NAME | REF. DRG. NO. | SIGN. AND DATE | INVENTORY NO.

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