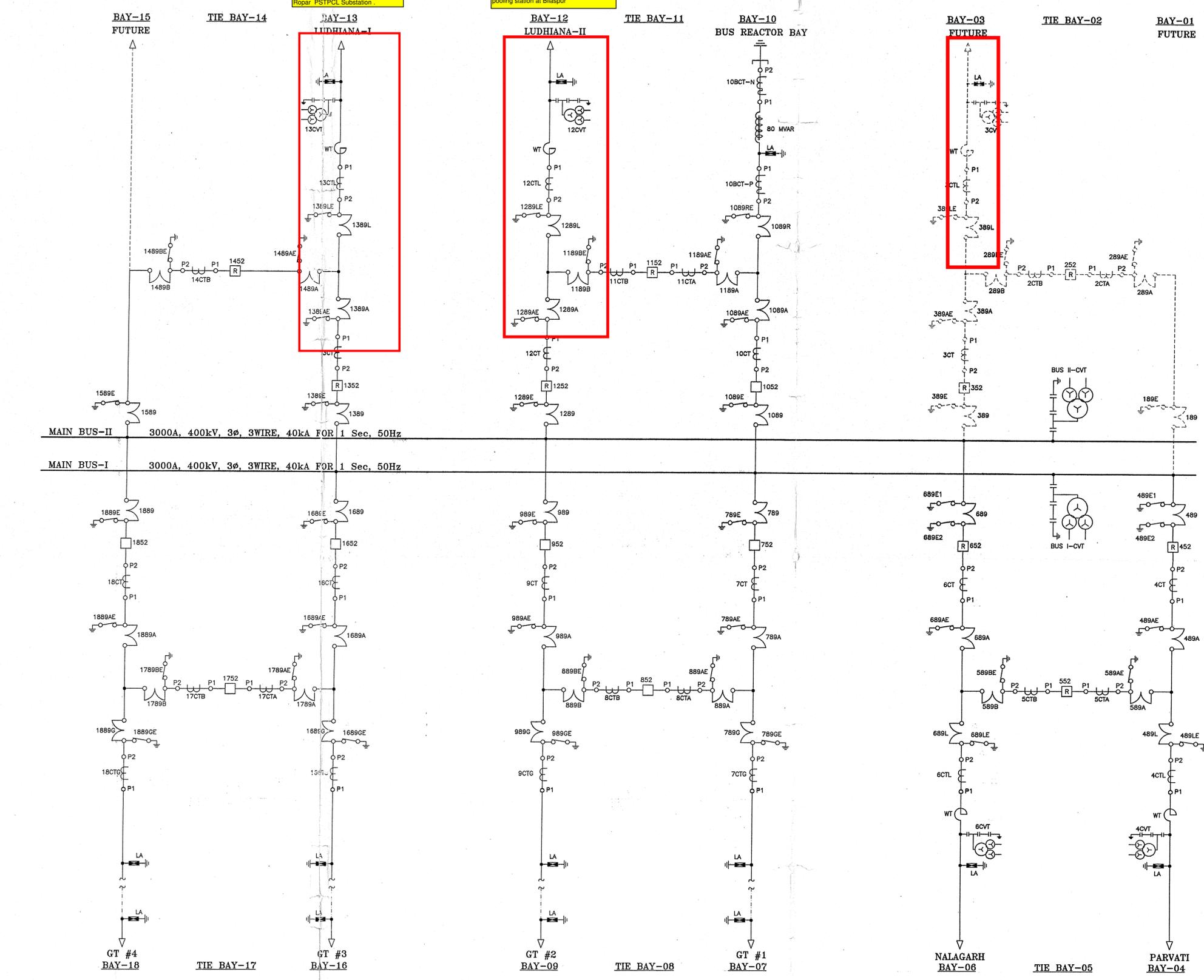


Future Bay#03 will be used for Proposed 125MVAR Bus Reactor (1PH). Space is App: 30mt. Available. The location of Spare reactor and its road interconnection with existing road is also in the scope of Bidder.

REV. 01 DRG. NO. 5501-500-PVE-P-001



BILL OF MATERIAL (PRESENT SCOPE)

SL.NO.	SYMBOL	ITEM DESCRIPTION	RATING	QTY.
01.	[Symbol]	CIRCUIT BREAKER	400kV, SF6, 2000A, 40kA/1 SEC.	7 Nos.
02.	[Symbol]	CIRCUIT BREAKER WITH CLOSING RESISTOR	400kV, SF6, 2000A, 40kA/1 SEC.	7 Nos.
03.	[Symbol]	CENTRE BREAK ISOLATOR WITH ONE EARTH SWITCH	400kV, HCB, 2000A, 40kA/1 SEC.	36 Nos.
04.	[Symbol]	CENTRE BREAK ISOLATOR WITH TWO EARTH SWITCH	400kV, HCB, 2000A, 40kA/1 SEC.	2 Nos.
05.	[Symbol]	CURRENT TRANSFORMER (1#)	400kV, 5 CORE, 2000A, 40kA/1 SEC.	78 Nos.
06.	[Symbol]	BUSHING CURRENT TRANSFORMER (1#)	400kV, 5 CORE, 2000A, 40kA/1 SEC.	78 Nos.
07.	[Symbol]	CAPACITOR VOLTAGE TRANSFORMER (1#)	400kV, 3 CORE, 2000A, 40kA	6 Nos.
			4400 pf *	6 Nos.
			6600 pf *	6 Nos.
			8800 pf *	6 Nos.
08.	[Symbol]	WAVE TRAP (1#)	400kV, 2000A	4 Nos.
			0.5 mH *	4 Nos.
09.	[Symbol]	SURGE ARRESTOR (1#)	400kV, GAPLESS	39 Nos.
10.	[Symbol]	BUS REACTOR (1#)	26.67 MVAR	3 Nos.

CT & CVT PARAMETERS

CORE	400kV CT	400kV CVT
CORE-1	2000-1000/1A, PS V _k > 2000V/1000V I _{mag} = 30/60 mA AT V _k R _{CT} < 10-5 Ohm	400kV / 110V CL. 3P, 200VA
CORE-2	2000-1000/1A, PS V _k > 2000V/1000V I _{mag} = 30/60 mA AT V _k R _{CT} < 10-5 Ohm	400kV / 110V CL. 3P, 200VA
CORE-3	2000-1000-500/1A 40VA, CL-0.2	400kV / 110V CL. 0.2, 100VA
CORE-4	2000-1000-500/1A, PS V _k > 4000/2000/1000V I _{mag} = 30/60/120 mA AT V _k R _{CT} < 10-5-2.5 Ohm	-
CORE-5	2000-1000-500/1A, PS V _k > 4000/2000/1000V I _{mag} = 30/60/120 mA AT V _k R _{CT} < 10-5-2.5 Ohm	-

SHUNT REACTOR - RCT PARAMETERS

CORE	400kV BUSHING CT (10BCT-P)	400kV BUSHING CT (10BCT-N)
CORE-1	200/1A, 5P20, 10VA	RATING SHALL BE PROVIDED BY MANUFACTURER (WTI)
CORE-2	200/1A, PS V _k > 200V I _{mag} = 60 mA AT V _k R _{CT} < 1 Ohm	200/1A, CL. 0.5, ISF<5, 10VA
CORE-3	200/1A, PS V _k > 200V I _{mag} = 60 mA AT V _k R _{CT} < 1 Ohm	200/1A, PS, V _k > 200V I _{mag} = 60 mA AT V _k R _{CT} < 1 Ohm
CORE-4	PROJECT ENGG. ELECTRICAL	200/1A, PS V _k > 200V I _{mag} = 60 mA AT V _k R _{CT} < 1 Ohm

Calc 1 Appd

APPROVED AS MARKED, RESUBMIT
NOT APPROVED, RESUBMIT
FOR INFORMATION & RECORDS

SIGN & DATE: [Signature] 06
DESIGNATION: A4DEL REF. 01

NTPC National Thermal Power Corporation Ltd.
(A GOVERNMENT OF INDIA ENTERPRISE)

PROJECT : KOLDAM HYDRO ELECTRIC POWER PROJECT (4x200MW)
PACKAGE : 400 SWITCHYARD PACKAGE (CS-5501-500-2)

LARSEN & TOUBRO LIMITED
ECC Division - EDRC

CODE	SOURCE	SCALE	DATE	27.10.05	28.10.05	14.11.05	16.11.05
			NAME	SSV/VIN	AGS	HVB	DM
			DSN.	DRWN.	CHKD.	APPRD.	

TITLE: SINGLE LINE DIAGRAM FOR 400kV SWITCHYARD

DRAWING NO. 5501-500-PVE-P-001 REV. 01

LEGEND:

— PRESENT SCOPE (SPEC. No.: CS-5501-500-2)

--- FUTURE

TL BETWEEN POWER HOUSE & SUBSTATION (L&T SCOPE)

* RATING WILL BE FINALISED BASED ON PGCL REQUIREMENTS

NO.	DATE	REMARKS	BY	APPD.	DRG.NO.	TITLE
01	27.12.2005	REVISED AS PER NTPC COMMENTS DTD. 19.12.2005	HVB	DM	5501-999-POE-J-001 (R-8)	SINGLE LINE DIAGRAM FOR 400kV SWITCHYARD. (TENDER DRAWING)
00	16.11.2005	FOR APPROVAL / FIRST SUBMISSION	HVB	DM	5501-999-POE-J-001 (R-8)	SINGLE LINE DIAGRAM FOR 400kV SWITCHYARD. (TENDER DRAWING)

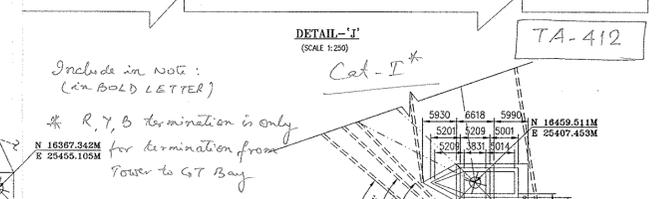
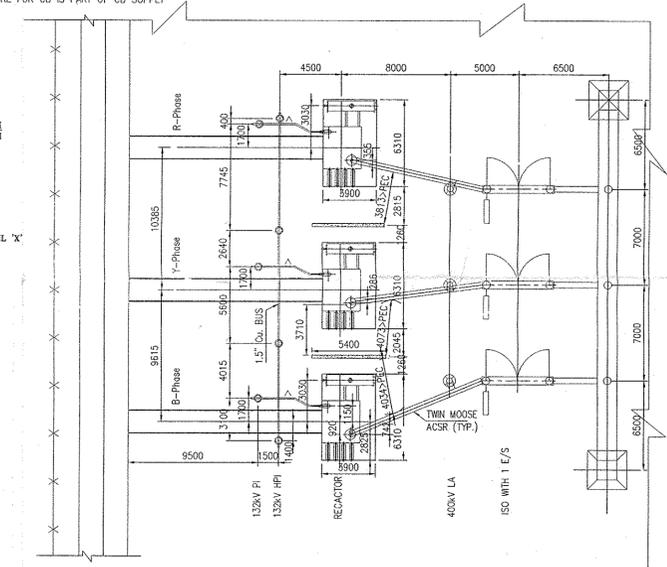
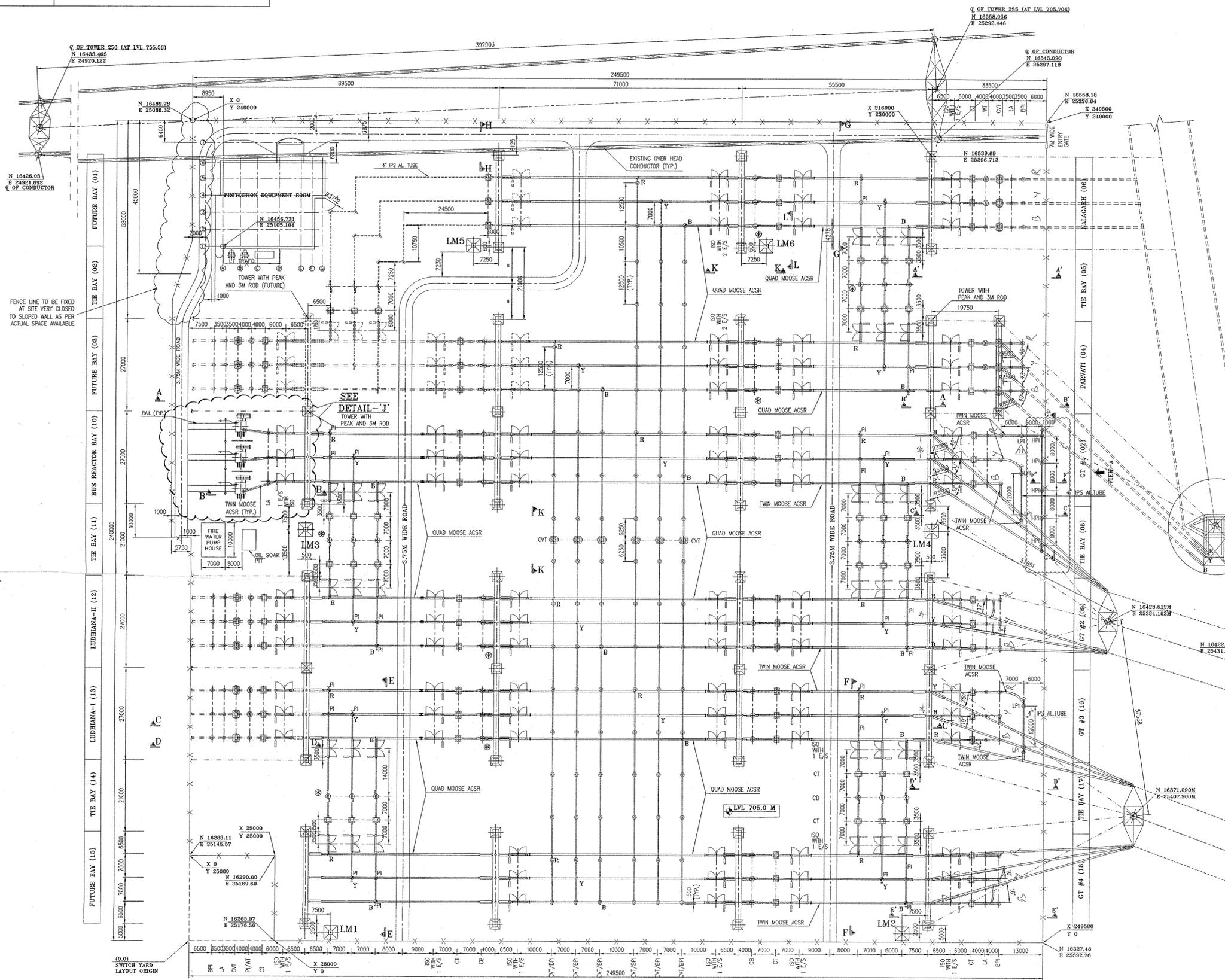
RELEASE STATUS	SIGN	DATE
PRELIMINARY		
FOR TENDER ONLY		
FOR APPROVAL/REFERENCE/INFORMATION		
FOR CONSTRUCTION		

APPROVED BY: MECHANICAL, ELECTRICAL, CIVIL & STRL.

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SL. NO.	SYMBOL	ITEM DESCRIPTION	RATING	QUANTITY		
				EQPT.	STR.	FDN.
1		CIRCUIT BREAKER (3ø)	400KV, SF6, 2000A, 40KA/1 SEC.	7 NOS	7 NOS	7 NOS
2		CIRCUIT BREAKER WITH CLOSING RESISTOR (3ø)	400KV, SF6, 2000A, 40KA/1 SEC.	7 NOS	7 NOS	7 NOS
3		CENTRE BREAK ISOLATOR WITH ONE EARTH SWITCH (3ø)	400KV, HCB, 2000A, 40KA/1 SEC.	36 NOS	36 NOS	36 NOS
4		CENTRE BREAK ISOLATOR WITH TWO EARTH SWITCH (3ø)	400KV, HCB, 2000A, 40KA/1 SEC.	2 NOS	2 NOS	2 NOS
5		CURRENT TRANSFORMER (1ø)	400KV, 5 CORE, 2000A, 40KA/1 SEC.	78 NOS	78 NOS	78 NOS
6		CAPACITIVE VOLTAGE TRANSFORMER (1ø)	400KV, 3 CORE, 2000A, 40KA/1 SEC.	18 NOS	18 NOS	18 NOS
7		WAVE TRAP (1ø)	400KV, 2000A	8 NOS	8 NOS	8 NOS
8		SURGE ARRESTOR (1ø)	400KV, 10KA/20KA GAPLESS	27 NOS	27 NOS	27 NOS
9		BUS POST INSULATOR	400KV	153 NOS	153 NOS	153 NOS
10		BUS POST INSULATOR	132KV	7 NOS	7 NOS	7 NOS
11		BUS REACTOR (1ø)	26.67 MVAR, 1 PHASE, ON AIR	1 NOS	1 NOS	1 NOS
12		TOWER WITH PEAK AND 3M ROD		1 NOS	1 NOS	1 NOS
13		TOWER WITH PEAK AND 3M ROD		1 NOS	1 NOS	1 NOS
14		TOWER WITH PEAK AND 3M ROD		20 NOS	20 NOS	20 NOS
15		PRESENT SCOPE		-	-	-
16		FUTURE / OTHERS		-	-	-

** - STRUCTURE FOR CB IS PART OF CB SUPPLY



APPROVED BY: [Signature]
 NTPC Limited
 PE-ELECTRICAL
 APPROVED UNDER CATEGORY []
 APPROVED AS TECHNICAL RESIDENT
 NOT APPROVED AS RESIDENT
 FOR INFORMATION & RECORDS
 SIGN. & DATE: [Signature] 26/02/09
 DESIGNATION: [Signature]

PROJECT : KOLDAM HYDRO ELECTRIC POWER PROJECT (4x200MW)
 PACKAGE : 400kV SWITCHYARD PACKAGE (CS-5501-500-2)
 LARSEN & TOUBRO LIMITED
 ECC Division - EDRC
 CODE SOURCE SCALE DATE 27.10.05 28.10.05 14.11.05 16.11.05
 NAME SSV/YTN ACS HWB DM
 DSN. DRWN. CHKD. APPRD.
 TITLE: 400kV SWITCHYARD LAYOUT - PLAN
 DRAWING NO. 5501-500-PVE-F-001 REV. 11

NO.	DATE	REMARKS	BY	APPD.	REFERENCE DRAWINGS
11	13.02.2009	REVISED BASED ON CIVIL FOUNDATION LAYOUT	SSV	KKJK	
10	30.06.2008	REVISED AS PER NTPC COMMENTS DTD. 18.06.2008	SSV	KKJK	
09	04.06.2008	REVISED AS PER NTPC COMMENTS DTD. 12.05.2008	SSV	KKJK	
08	24.04.2008	REVISED FOR GT & LINE TERMINATION WITH SWITCHYARD	SSV	KKJK	
07	14.05.2007	REVISED INCORPORATING CLEARANCE DIAGRAM FOR REACTOR AREA	KVRN	KVRN	
06	13.04.2007	REVISED REACTOR AREA IN LINE WITH REACTOR GA DRAWING	SSV	KVRN	5501-500-PVE-F-014 (R-00)
05	18.01.2007	REVISED AS PER NTPC TELECON DATED 18.01.07	SSV	KVRN	5501-500-PVE-F-002 (R-00)
04	14.06.2006	REVISED AS PER NTPC COMMENTS DTD. 05.06.2006	SSV	KVRN	5501-500-PVE-P-001 (R-00)
03	31.05.2006	REVISED AS PER DISCUSSION WITH NTPC ON 18.05.2006	SSV	KVRN	5501-500-PVE-A-001 (R-B)
02	07.02.2006	REVISED AS PER NTPC COMMENTS DTD. 13.01.2006	SSV	HVB	SKETCH-A (R-0)
01	27.12.2005	REVISED AS PER NTPC COMMENTS DTD. 20.12.2005	SSV	HVB	SKETCH-B (R-0)
00	16.11.2005	FOR APPROVAL / FIRST SUBMISSION	HVB	DM	DRG.NO.

NOTES:
 1. ALL DIMENSIONS ARE IN mm AND LEVELS ARE IN METRES
 2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRG. NO.: 5501-500-PVE-F-002
 3. FOLLOWING CLEARANCES ARE ADOPTED (MINIMUM)

PHASE TO PHASE	400kV	132kV (AS PER S 10118)
PHASE TO EARTH	4000mm	1300mm
SECTION CLEARANCE	3500mm	1300mm
GROUND CLEARANCE	6000mm	4000mm
	2550mm	2550mm

 4. CONDUCTOR DETAILS
 LINE BAY : QUAD MOOSE GENERATOR BAY : TWIN MOOSE
 5. LOCATION OF WAVE TRAPS ARE INDICATIVE ONLY AND THE EXACT LOCATION WILL BE BASED ON PLOCC REQUIREMENT.
 6. PI SHALL BE INSTALLED FOR THE 3RD, PHASE WITHOUT WAVE TRAP. HOWEVER, FOUNDATIONS SHALL BE SUITABLE FOR WAVE TRAPS
 7. NORMAL TENSION FOR CONDUCTORS
 TWIN MOOSE : 2T/CONDUCTOR - 4T/PHASE
 QUAD MOOSE : 1.5T/CONDUCTOR - 6T/PHASE
 8. NEW TOWER & GANTRY SHALL BE DESIGNED AS PER ANGLE OF DEVIATION
 9. POWER GRID LINE DEAD END TOWER SHALL BE MADE & POSITIONED AS INDICATED TO ACHIEVE ADEQUATE CLEARANCE
 10. THE MAXIMUM CONDUCTOR TENSION ON THE O/G PHASE CONDUCTOR SHALL BE SUCH THAT THE TENSION VALUES SHALL NOT EXCEED THE FOLLOWING VALUES
 a. MAX. TENSION/CONDUCTOR IN THE DIRECTION PERPENDICULAR TO THE GURDIN IN HORIZONTAL PLANE = 2.0 MT
 b. MAX. TENSION/CONDUCTOR IN THE DIRECTION PARALLEL TO THE GURDIN IN HORIZONTAL PLANE = 1.0 MT
 11. R,Y,B PHASE SEQUENCE LINE & GT FEEDERS SHALL BE CONFIRMED BY WIRE.
 12. TO OBTAIN THE PHASE TO EARTH CLEARANCE WE PROPOSE TO PROVIDE ONE PLATFORM AT 25 m LEVEL FOR LMS AND LMG

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