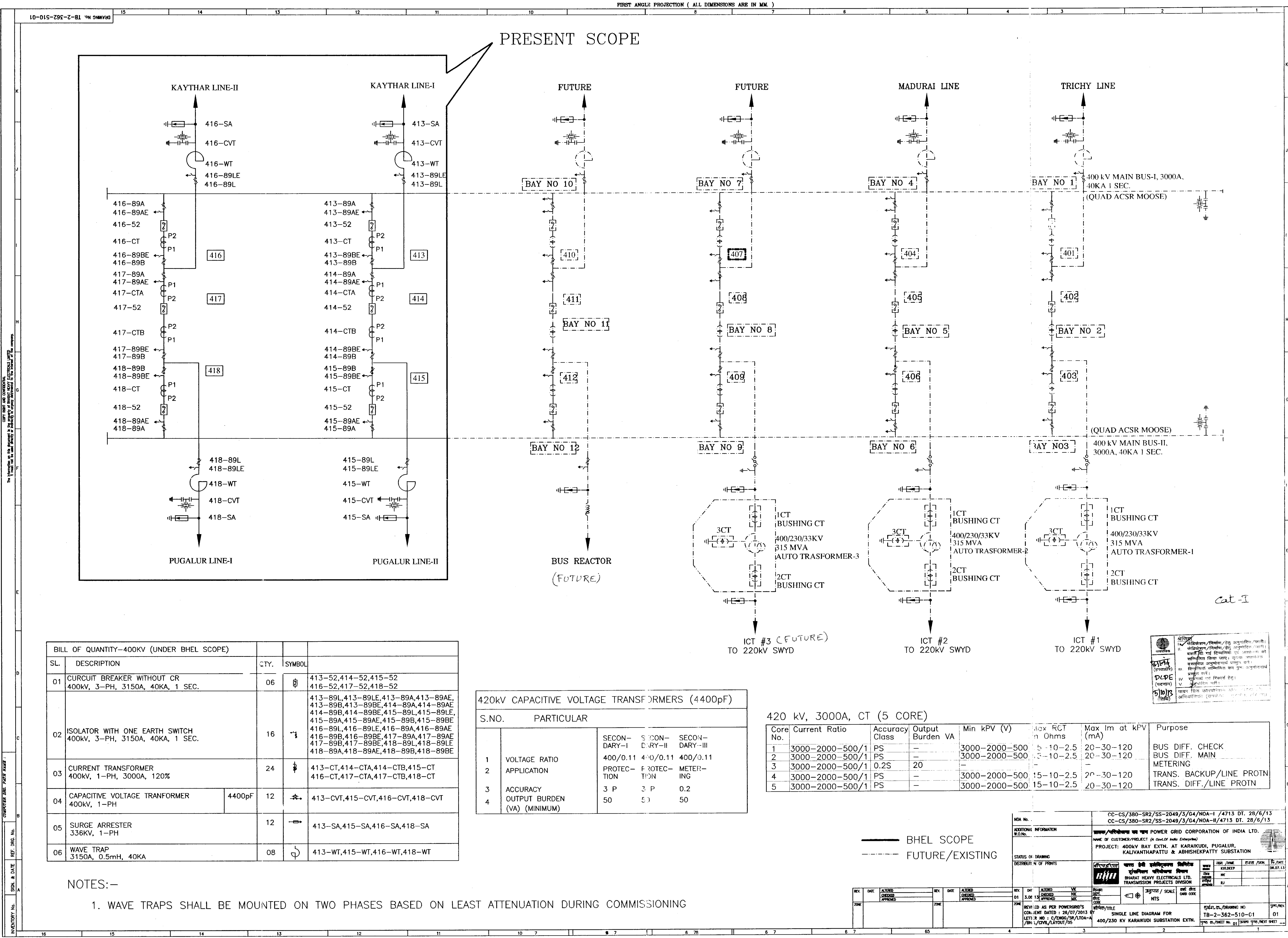




BILL OF QUANTITY-400KV (UNDER BHEL SCOPE)			
SL.	DESCRIPTION	QTY.	SYMBOL
01	CIRCUIT BREAKER WITHOUT CR 400KV, 3-PH, 3150A, 40KA, 1 SEC.	06	
02	ISOLATOR WITH ONE EARTH SWITCH 400KV, 3-PH, 3150A, 40KA, 1 SEC.	16	
03	CURRENT TRANSFORMER 400KV, 1-PH, 3000A, 120%	24	
04	CAPACITIVE VOLTAGE TRANSFORMER 400KV, 1-PH	12	
05	SURGE ARRESTER 336KV, 1-PH	12	
06	WAVE TRAP 3150A, 0.5mH, 40KA	08	

420KV CAPACITIVE VOLTAGE TRANSFORMERS (4400pF)			
S.NO.	PARTICULAR	SECON-DARY-I	SECON-DARY-II
1	VOLTAGE RATIO	400/0.11	400/0.11
2	APPLICATION	PROTEC-TION	METER-ING
3	ACCURACY	3 P	0.2
4	OUTPUT BURDEN (VA) (MINIMUM)	50	50

420 kV, 3000A, CT (5 CORE)							
Core No.	Current Ratio	Accuracy Class	Output Burden VA	Min kPV (V)	Max RCT in Ohms	Max Im at kPV (mA)	Purpose
1	3000-2000-500/1	PS	-	3000-2000-500	5-10-2.5	20-30-120	BUS DIFF. CHECK
2	3000-2000-500/1	PS	-	3000-2000-500	5-10-2.5	20-30-120	BUS DIFF. MAIN
3	3000-2000-500/1	0.2S	20	-	-	-	METERING
4	3000-2000-500/1	PS	-	3000-2000-500	15-10-2.5	20-30-120	TRANS. BACKUP/LINE PROTIN
5	3000-2000-500/1	PS	-	3000-2000-500	15-10-2.5	20-30-120	TRANS. DIFF./LINE PROTIN

NOTES:-
1. WAVE TRAPS SHALL BE MOUNTED ON TWO PHASES BASED ON LEAST ATTENUATION DURING COMMISSIONING

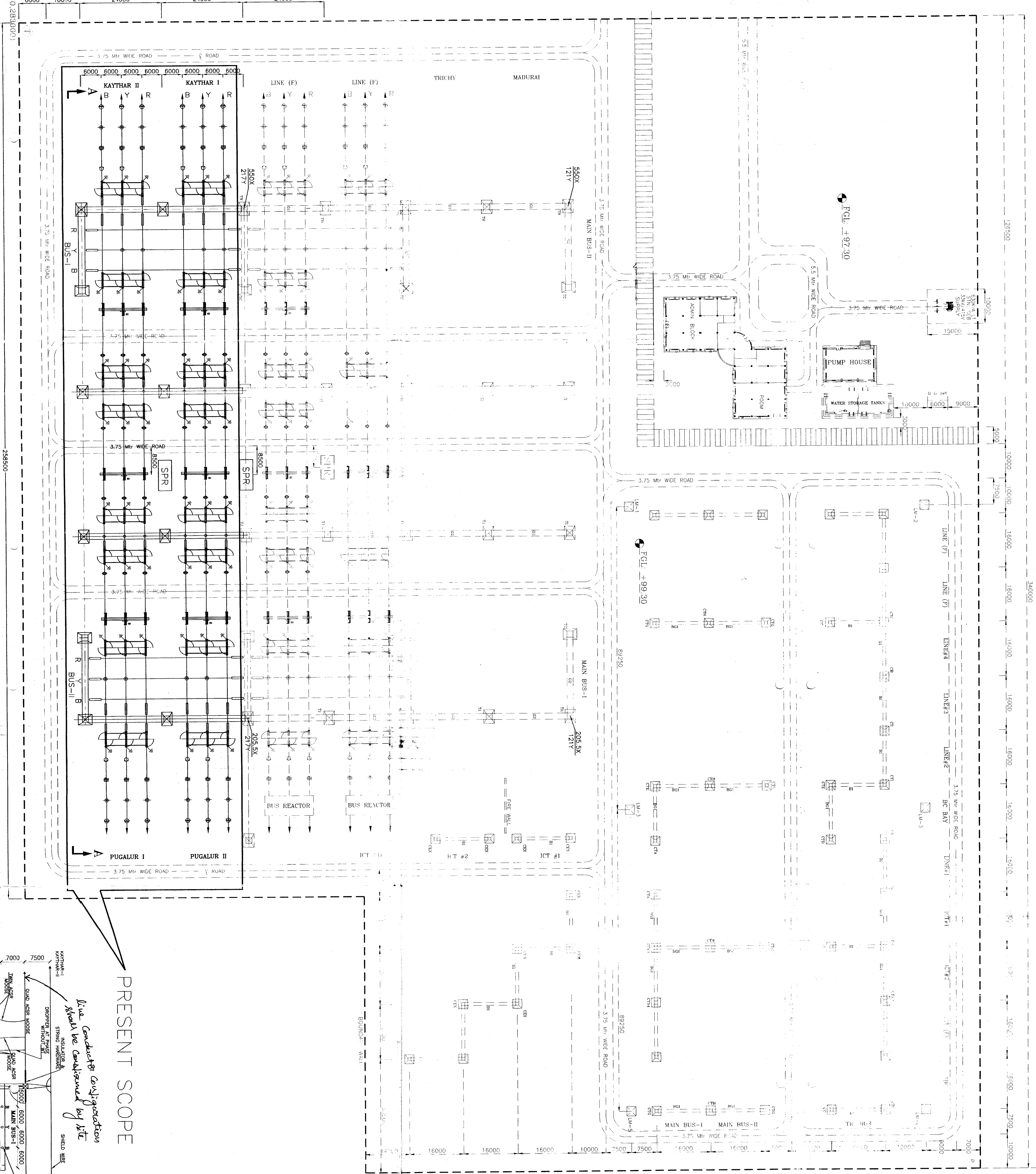
— BHEL SCOPE
--- FUTURE/EXISTING

REV	DATE	APPROVED	REV	DATE	APPROVED	REV	DATE	APPROVED	REV	DATE	APPROVED
01	06.07.13	APPROVED	01	06.07.13	APPROVED	01	06.07.13	APPROVED	01	06.07.13	APPROVED

REVISIONS AS PER POWERGRID'S COMMENT DATED : 26/07/2013
LETTER NO. : 15/ENR/2013/400-4
/B/L/CIVIL/LAYOUT/05

400/230 KV KARAKUDI SUBSTATION EXTN.

DATE: 06.07.13
DRAWING NO: TB-2-362-510-01
SHEET NO: 01



ITEM CODE	DESCRIPTION	SYMBOL	QTY.
1	420KX, 3150A, 40A/1s CIRCUIT BREAKER WITHOUT CLOSING RESISTOR (3-PH)		06 /
2	420KX, 3150, 100A/1s HDB ISOLATOR WITH 1 E/S (3-PH)		16 /
3	420KX, 3000A, 40A/1s CURRENT TRANSFORMER (1-PH)		24 /
4	420XV CAPACITIVE VOLTAGE TRANSFORMER (1-PH) (4400 PF)		12 /
5	338AV SURGE ARRESTER (1-PH)		12 /
6	WAVE TRAP 0.5 MH (3150A) (1-PH)		08 /
7	420XV POST INSULATOR (EXCLUDE 10 WAVE TRAP)		20 /

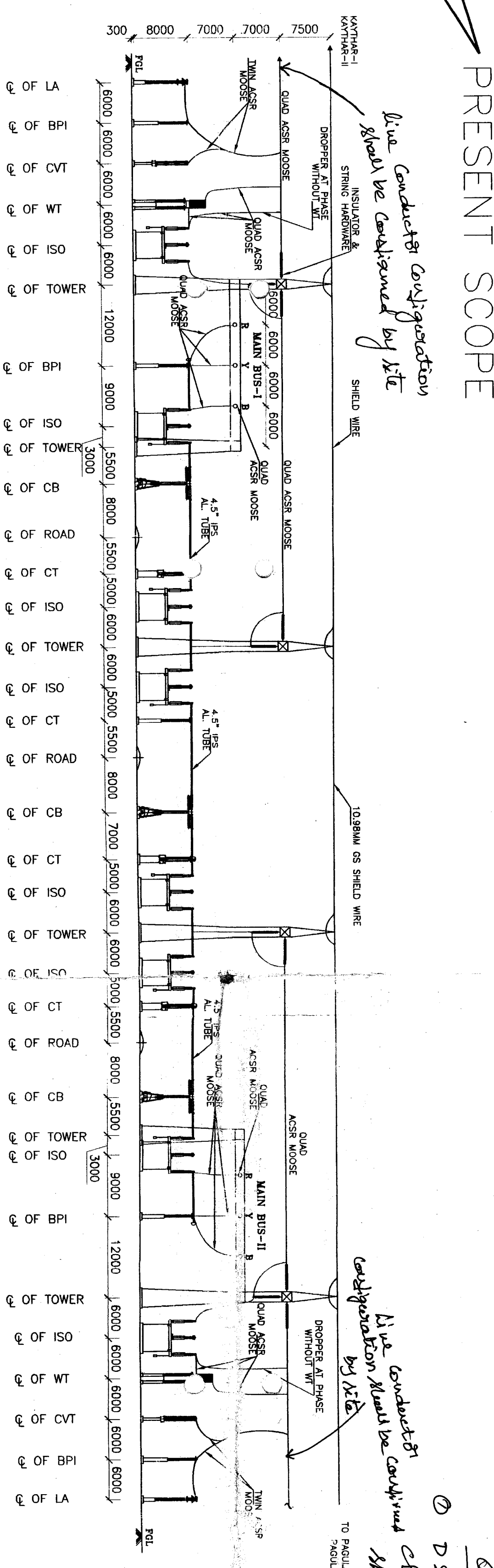
1.	NOMINAL SYSTEM VOLTAGE	400KV
2.	HIGHEST SYSTEM VOLTAGE	420KV
3.	RATED FREQUENCY	50Hz
4.	RATED SHORT TIME CURRENT FOR 1 SEC	40kA
5.	RATED FULL WAVE WITHSTAND VOLTAGE	1550kV
6.	DRP IMPULSE WITHSTAND VOLTAGE	650kV (max. +ve & -ve)
7.	MINIMUM CREEPAGE (2MM/KV)	10500MM
8.	SYSTEM NEUTRAL EARTHING	EFFECTIVELY EARTHED

MINIMUM CLEARANCE (MM)	4000
PHASE TO PHASE (PP)	4000/4200mm
PHASE TO EARTH (PE)	3500mm
SECTION CLEARANCE (SC)	6500mm
HEIGHT OF TUBE CENTRE LINE OF FIRST LEVEL (FROM PLINTH LEVEL)	8000mm

INDUCTOR	INS. STRING
QUAD MOOSE	DOUBLE TENSION
QUAD MOOSE	DOUBLE TENSION
45 PPS AL./QUAD/TWIN MOOSE	
40 mm	
40 mm	
SUB CONDUCTOR SPACING FOR TWIN	
10 GRAM DIA. 5% WIRE	
CARTWHEEL	

1. ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED OTHERWISE, COMPANY STANDARD.
2. PLANT LEVEL 1000mm ABOVE GROUND.
3. GRAVEL 100mm ABOVE 75mm THICK LAYER OF CEMENT CONCRETE.
4. CONDUCTOR TENSION – 4000KG/PI.
5. MAIN BUS 1000KG/SUB CONDUCTOR
6. EARTH WIRE 800KG/CONDUCTOR
7. THE REQUIRED CLEARANCES AS PER CLEARANCE TABLE ABOVE AND AS PER PROVISION OF I.E. RULE & OTHER STATUTORY REGULATION ETC SHALL BE MAINTAINED BY BHEL.
8. LINE SIDE INSULATOR STRING FOR LINE TERMINALIZATION & TENSION CLAMP FOR EARTH WIRE TERMINATION IS IN BHEL SCOPE.
9. ROAD BOUNDARY WALL/FENCE IS NOT IN PRESENT SCOPE.
10. LOCATION OF WAVE TAP IS INDICATIVE. THE SAME SHALL BE FINALISED DURING COMMISSIONING.
11. LOCATION ON LEAST ATTENUATION HOWEVER, THE PHASES SHALL BE CAVED IN ALL THE THREE PHASES.

— PRESENT SCOPE
--- EXISTING/FUTURE/NOT IN I&HEL SCOPE



SECTION A-A

[illegible]

CC=CS/380-SR2/SS-2049/3/G4/NOA-11/4714 PTP. 28.06.2013
NOA NO: CC=CS/380-SR2/SS-2049/3/G4/NOA-11/4713 DTD. 28.06.2013

POWER GRID CORPORATION OF INDIA LTD.	
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400/220kV SWITCH YARD AT	नाम/प्राधिकारी का नाम
KARAKUDI SUBSTATION	नाम OF CUSTOMER/PROJECT

NOA. NO. : CC-CS/125-WR1/SS-827/1/G6/NOA-1/4044/DATED-26.12.11	DATE	NAME	RECEIVED
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[illegible]

	INDIA TRANSMISSION PROJECTS DIVISION	INDIA TRANSMISSION PROJECTS DIVISION	INDIA TRANSMISSION PROJECTS DIVISION
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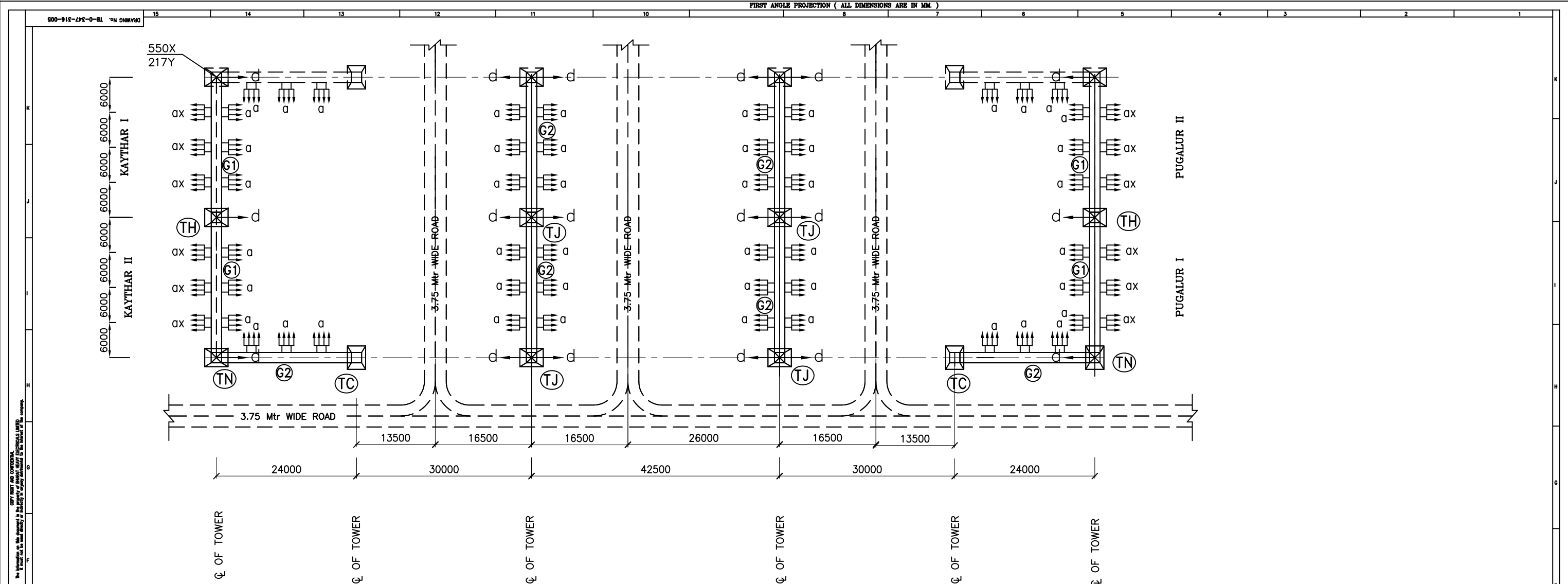
DEPT.		SCALE CARD 000E
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1 : 500		
1 : 500		

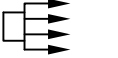
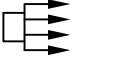
LAYOUT PLAN & SECTION FOR
TB-0-347-316-001
SUSPENSION/DRAWING NO.

400/230 KV KARAIKUDI SUBSTATION EXTN.

	Cat
	N



LOADING DETAIL:-

NOTATION	No. & Type of Cond./ Shield Wire per Phase	Normal Tension Per Phase(kg)	S/C Tension Per Phase(kg)	Separation Between Spacers (meters)
 a	QUAD. ACSR MOOSE	4000	5100	5.0 m
 ax	QUAD. ACSR MOOSE	4000 with 30° deviation	5100	5.0 m
 d	SHIELD WIRE	800	NOT APPLICABLE	NOT APPLICABLE
 dx	SHIELD WIRE	800 with 30° deviation	NOT APPLICABLE	NOT APPLICABLE

STRUCTURE DETAIL:-

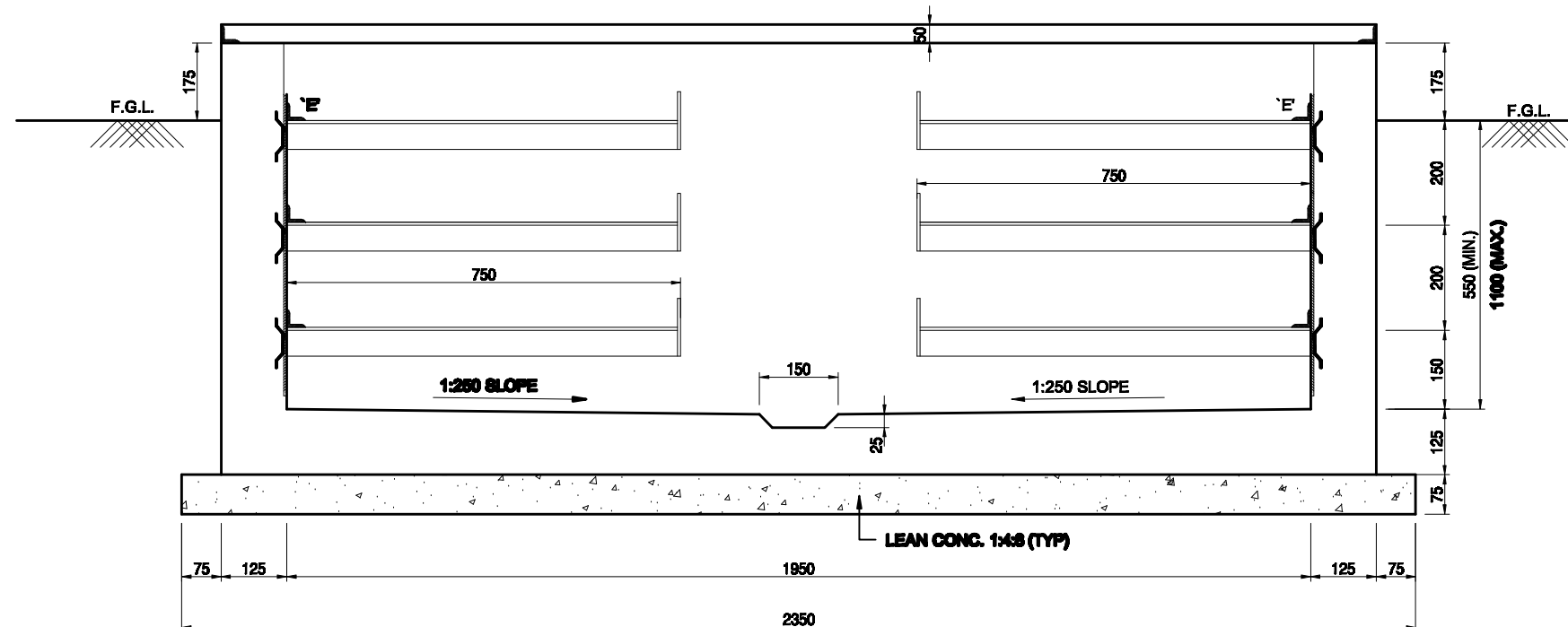
DETAILS OF TOWERS/BEAMS : 400kV			
S.NO.	STR DESIGNATION	STR. HT/SPAN	QTY.
1	TC	15M	02 Nos.
2	TH	22M+7.5M	02 Nos.
3	TJ	22M+7.5M	04 Nos.
4	TN	15M+7M+7.5M	02 Nos.
5	G1	24M	04 Nos.
6	G2	24M	06 Nos.

NOTE:-

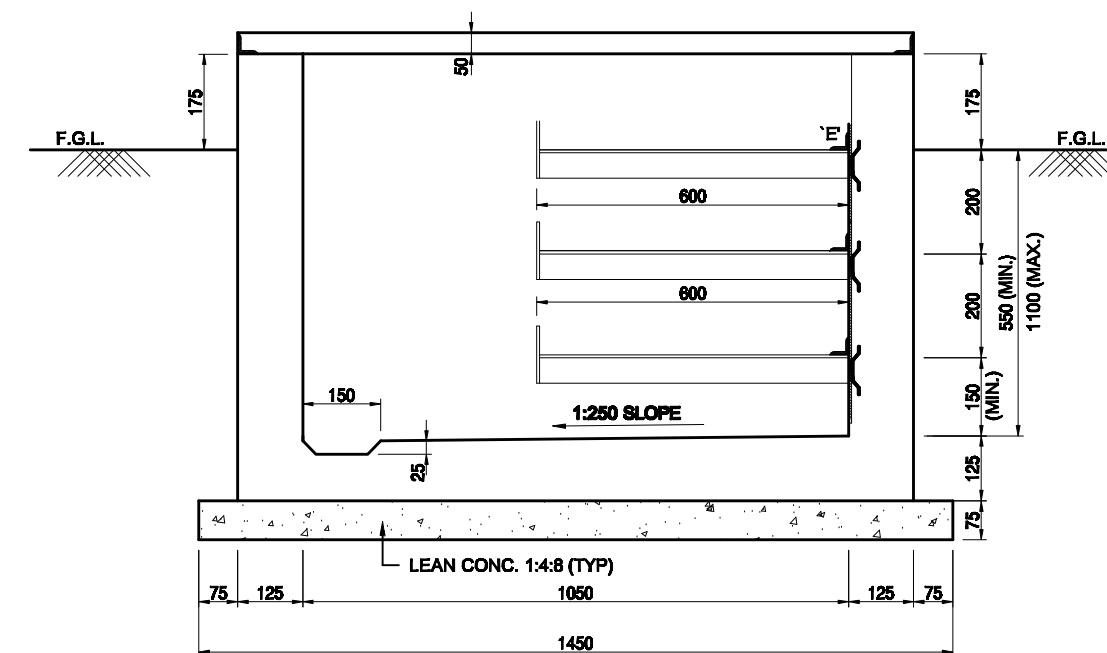
- ALL DIMENSIONS ARE IN MM
- ROAD, BOUNDARY WALLS AND FENCE IS NOT IN PRESENT SCOPE.

REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	REV.	DATE	ALTERED CHECKED APPROVED	विभाग DEPT. कोड CODE	उत्पाद / SCALE 1 : 700	कार्ड कोड CARD CODE	शीर्षक/TITLE STRUCTURAL LAYOUT PLAN FOR 400/230kV KARAIKUDI SUBSTATION	ड्राईंग. क्र./DRAWING NO. TB-3-362-316-005	पुनः/REV. 00
ZONE			ZONE			ZONE							पृष्ठ क्र./SHEET No. 01	अगला पृष्ठ/NEXT SHEET --

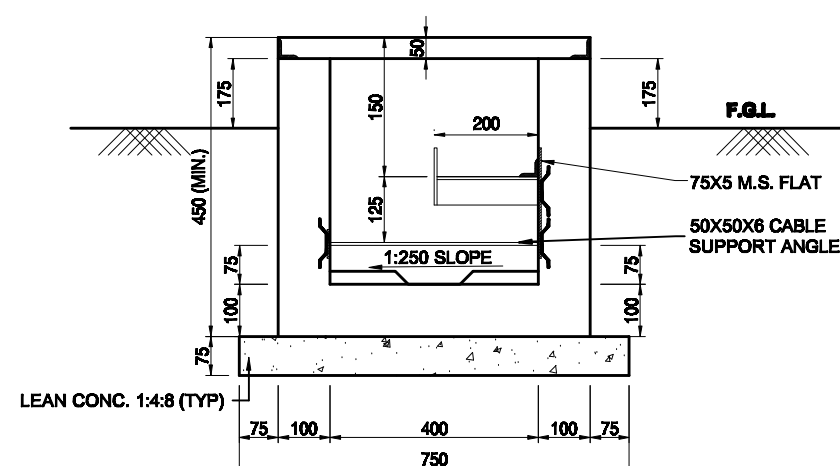
ADDITIONAL INFORMATION W.O.No.	आह्वक/परियोजना का नाम POWER GRID CORPORATION OF INDIA LTD.			
STATUS OF DRAWING	NAME OF CUSTOMER/PROJECT PROJECT: 400kV BAY EXTN. AT KARAIKUDI, PUGALUR, KALIVANTHAPATTU & ABHISHEKPATTY SUBSTATION			
DISTRIBUTION OF PRINTS	भारत हेवी इलेक्ट्रिकल्स लिमिटेड द्वारा Bharat Heavy Electricals Ltd. TRANSMISSION PROJECTS DIVISION	काम DRAWN RK जांचा CHECKED NK स्वीकृत APPROVED MK	नाम /NAME हस्ता /SIGN. दि./DATE 22.07.13	



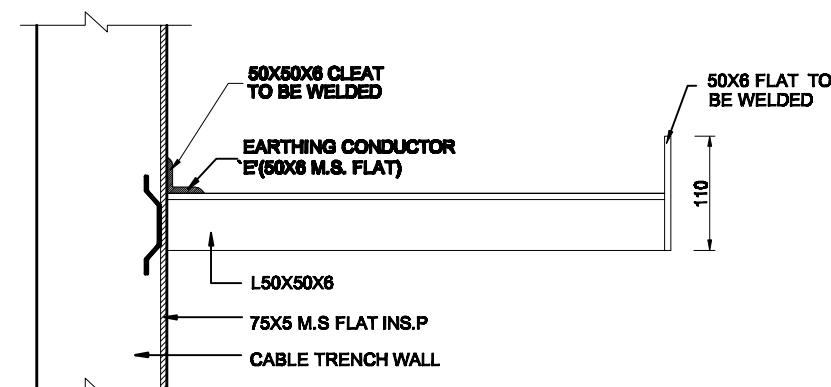
SECTION 1-1



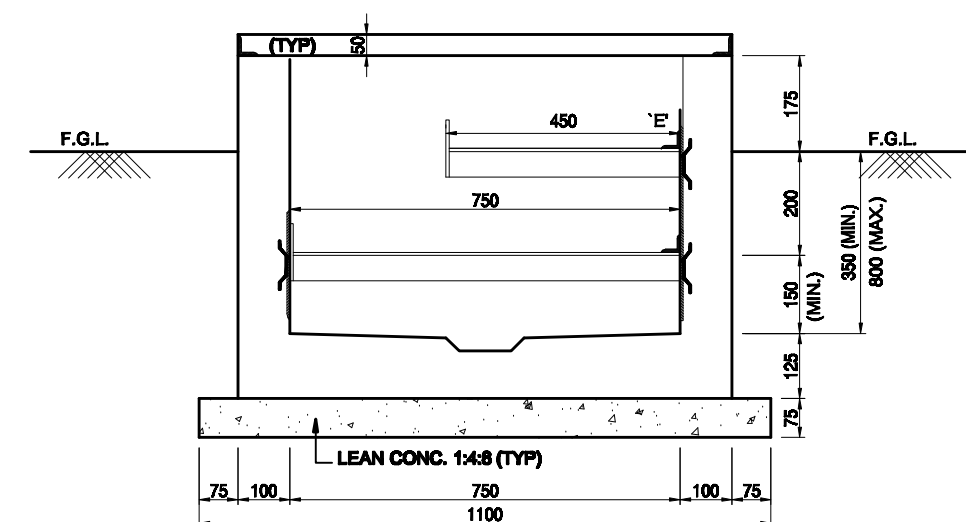
SECTION 2-2



SECTION 4-4



TYPICAL CABLE SUPPORT



SECTION 3-3

NOTE:

1. ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE SPECIFIED.
2. R.C.C. MIX SHOULD BE 1:1.5:3 (1 CEMENT: 1.5 COARSE SAND:3 STONE AGGREGATE 20mm NOMINAL SIZE.)
3. LEAN CONC. SHALL BE IN THE RATIO.1:4:8.
(1 CEMENT:4 COURSE SAND: 8STONE AGGREGATE 40MM NORMAL SIZE)
4. FOR ALL OTHER NOTES REF. DRG. No. C/ENGG/STD/CT-1(SHEET-2)

APPROVED BY ED (ENGG) ON 02.05.2005 VIDE NOTE
SHEET REF. NO. C/ENGG/CIV/Std-S/S DTD 30.03.2005

RELEASED FOR CONSTRUCTION.

POWER GRID CORPORATION
OF INDIA LIMITED
(A Government of India Enterprise)



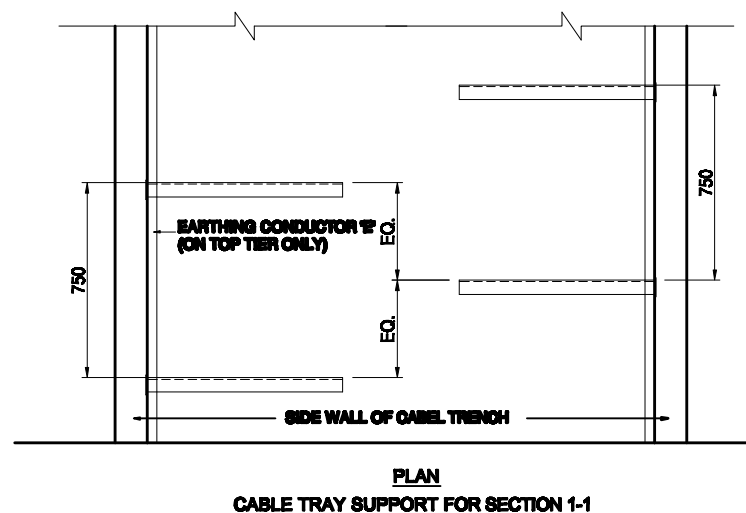
PROJECT: STANDARD DRAWING FOR CABLE TRENCH

TITLE: DETAIL FOR CABLE
TRENCH SECTIONS.

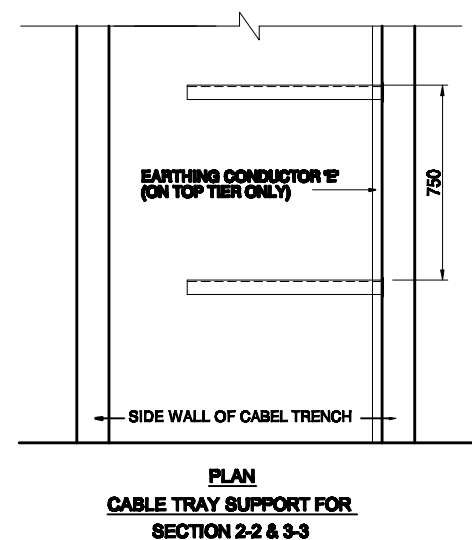
PREP	REVD	REVD	REVD	REVD	APPD	DATE

SCALE	DRAWING NO.	C/ENGG/STD/CT-1	REV
NTS			R-0

SHEET NO - 1 OF 2



PLAN
CABLE TRAY SUPPORT FOR SECTION 1-1



PLAN
CABLE TRAY SUPPORT FOR
SECTION 2-2 & 3-3