

BILL OF QUANTITY FOR 400kV SIDE:

1		SF6 CIRCUIT BREAKER WITHOUT CR., WITH CONTROL
2		SF6 CIRCUIT BREAKER WITH CR., WITH CONTROL
3		HORIZONTAL DOUBLE BREAK ISOLATOR WITH ONE EARTH SWITCH
4		CURRENT TRANSFORMER (1#)
5		SURGE ARRESTOR (1#)
6		CAPACITOR VOLTAGE TRANSFORMER
7		WAVE TRAP

LEGEND:

- UNDER PRESENT SCOPE

- FUTURE/EXISTING

FOR TENDER PURPOSE ONLY

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

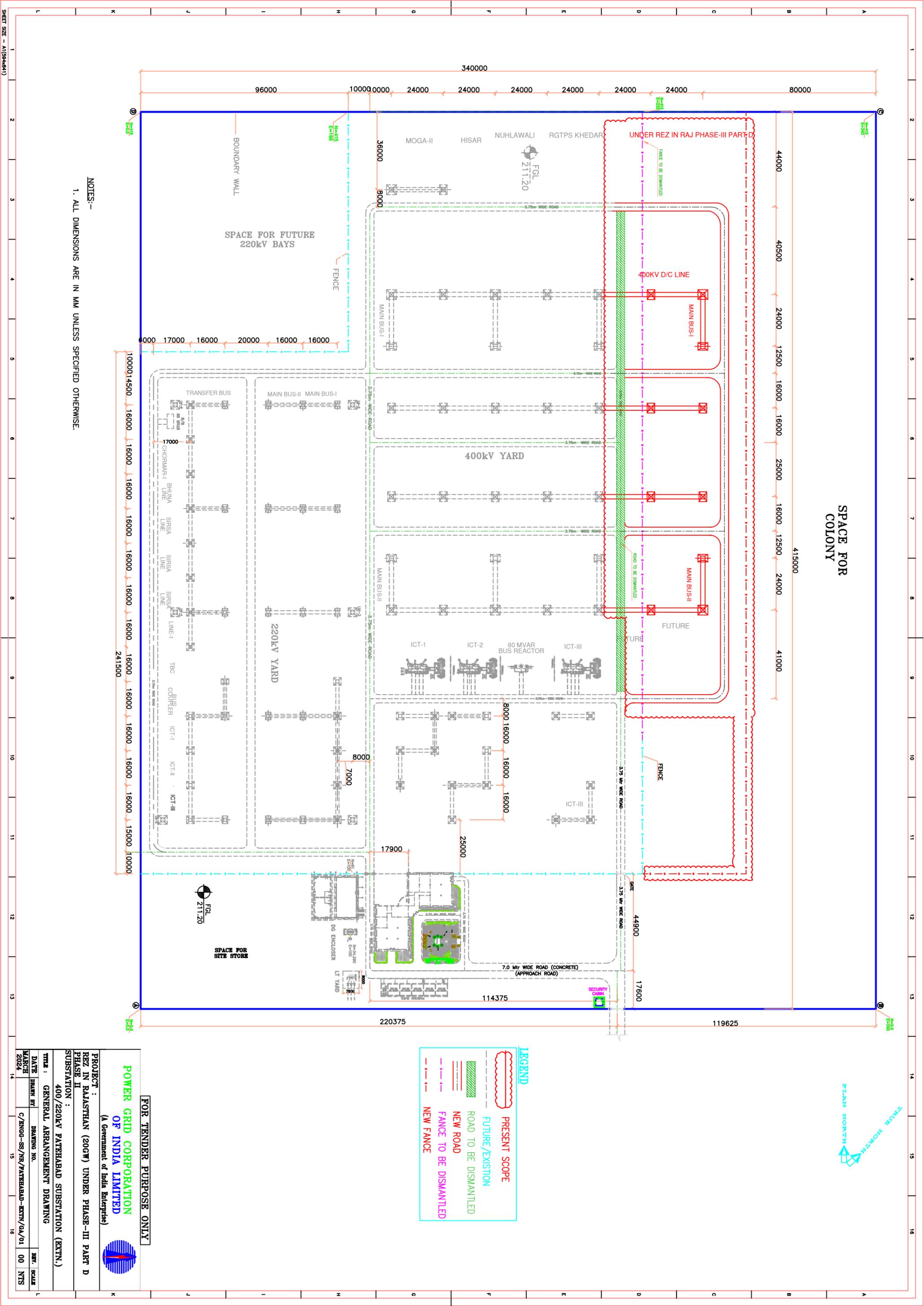


PROJECT : REZ IN RAJASTHAN (20GW) UNDER PHASE-III PART D PHASE II

SUBSTATION : 400/220kV FATEHABAD SUBSTATION (EXTN.)

TITLE : SINGLE LINE DIAGRAM

DATE	DRAWN BY	DRAWING NO.	REV.	SCALE
MARCH 2024		C/ENGG-SS/NR/FATEHABAD-EXTN/SLD/01	00	NTS



SPACE FOR COLONY

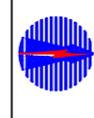


LEGEND

	PRESENT SCOPE
	FUTURE/EXISTION
	ROAD TO BE DISMANTLED
	NEW ROAD
	FANCE TO BE DISMANTLED
	NEW FANCE

FOR TENDER PURPOSE ONLY

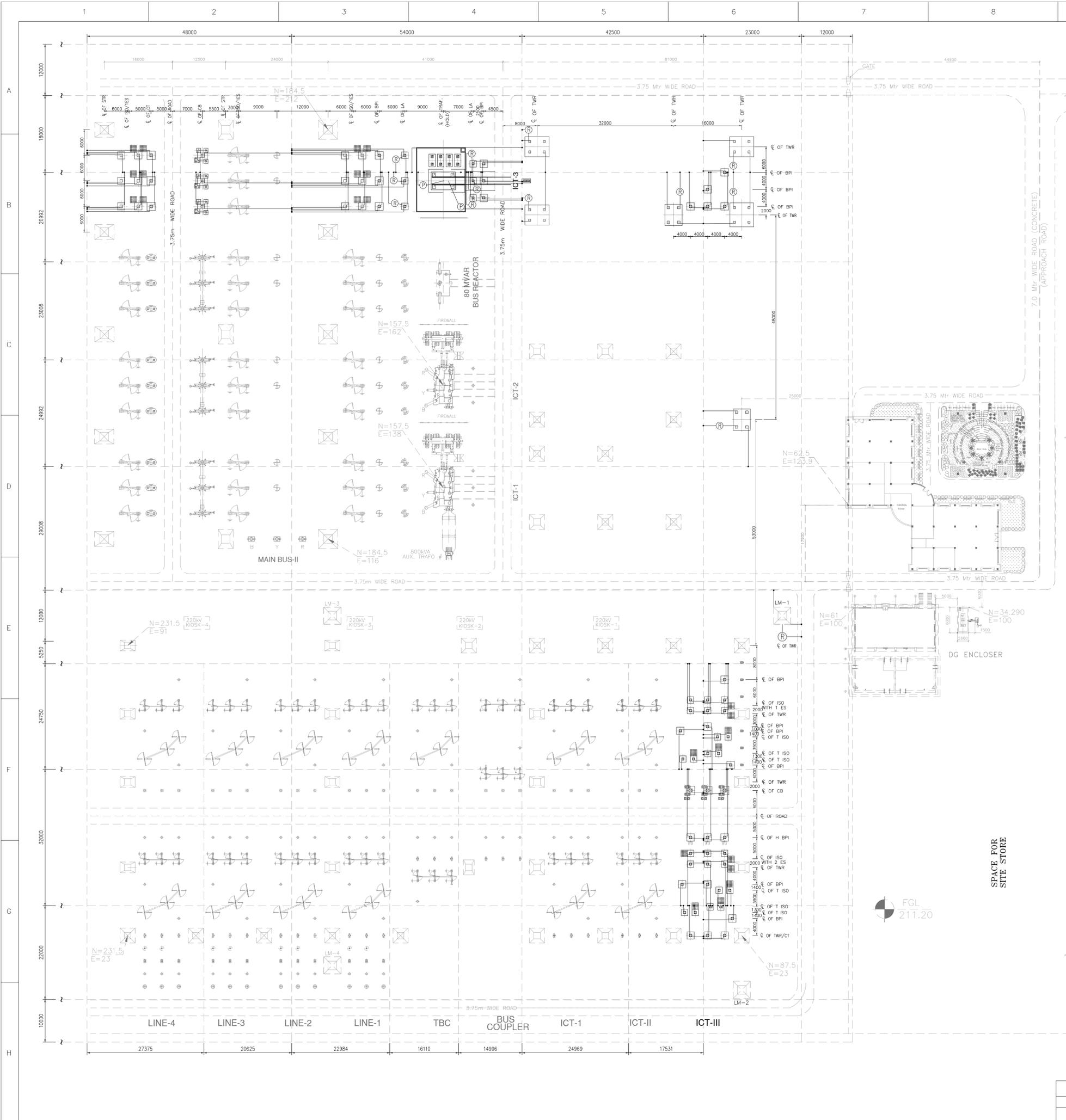
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)



PROJECT : REZ IN RAJASTHAN (20GW) UNDER PHASE-III PART D PHASE II
SUBSTATION : 400/220kV FATEHABAD SUBSTATION (EXTN.)

TITLE : GENERAL ARRANGEMENT DRAWING	EXT. SCALE
DATE : MARCH 2024	DATE : MARCH 2024
DRAWN BY : C/ENGG-SR/NR/FATEHABAD-EXTN/GA/01	CHKD BY : 00
DRAWING NO. :	NTS

NOTES:-
1. ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED OTHERWISE.



NOTES:-

1. ALL DIMENSIONS ARE IN MM.
2. EARTHING CONNECTIONS OF EQUIPMENTS SHOWN ARE DIAGRAMATIC ONLY. EXACT LOCATIONS OF EQUIPMENTS EARTHING CONNECTION LEADS, EARTH ELECTRODES MAY BE CHANGED TO SUIT SITE CONDITIONS.
3. EARTHING LEADS FROM EQUIPMENTS/STRUCTURES SHALL BE CONNECTED TO DIFFERENT CONDUCTORS OF MAIN EARTHING GRID.
4. DEPTH OF LAYING OF MAIN EARTHING CONDUCTOR SHALL BE 600mm BELOW THE FINISHED GROUND LEVEL.
5. EARTHING CONDUCTOR AROUND THE BUILDING SHALL BE BURIED IN EARTH AT A MINIMUM DISTANCE OF 1500mm FROM THE OUTER BOUNDARY OF THE BUILDING. IN CASE HIGH TEMPERATURE IS ENCOUNTERED AT SOME LOCATION, THE EARTHING CONDUCTOR SHALL BE LAID MINIMUM 1500mm AWAY FROM SUCH LOCATION.
6. WHEREVER EARTHING CONDUCTOR CROSSES CABLE TRENCHES, UNDERGROUND SERVICE DUCTS, PIPES, TUNNELS, RAILWAY TRACKS ETC., IT SHALL BE LAID MINIMUM 300mm BELOW THEM AND SHALL BE RE-ROUTED IN CASE IT FOULS WITH EQUIPMENT/STRUCTURE FOUNDATIONS.
7. 50mmx6mm MS FLAT SHALL RUN ON THE TOP TIER AND ALL ALONG THE CABLE TRENCHES EARTHED AT BOTH ENDS AND AT AN INTERVAL OF 30M. THE M.S FLAT. SHALL BE FINALLY PAINTED WITH TWO COATS OF RED OXIDE PRIMER AND TWO COATS OF POST OFFICE RED PRIMER AND TWO COATS OF POST OFFICE RED ENAMEL PAINT.
8. EACH EARTHING LEAD FROM THE NEUTRAL OF THE TRANSFORMER SHALL BE DIRECTLY CONNECTED TO TWO PIPE ELECTRODES IN TREATED EARTH PIT. THE TWO PIPE EARTH ELECTRODES SHALL BE SEPARATED BY AT LEAST 6MTRS.
9. EARTHING CONNECTIONS WITH EQUIPMENT EARTHING PADS SHALL BE BOLTED TYPE AND BELOW GROUND LEVEL CONNECTIONS SHALL BE WELDED TYPE. FOR RUST PROTECTIONS WELDS SHOULD BE TREATED WITH RED LEAD & AFTERWARDS COATED WITH BITUMEN COMPOUND TO PREVENT CORROSION AS PER SITE INCHARGE'S DIRECTION.
10. ALL BELOW GROUND LEVEL CONNECTIONS SHALL BE ELECTRIC ARC WELDING. ALL WELDED JOINTS SHALL BE ALLOWED TO COOL DOWN GRADUALLY TO ATMOSPHERIC TEMPERATURE BEFORE PUTTING ANY LOAD ON IT.
11. EARTHING CONDUCTOR CROSSING THE ROAD SHALL BE LAID 300mm BELOW ROAD.
12. AUXILIARY EARTHMAT SIZE 1.5mx1.5m SHALL BE LAID BELOW THE MAIN SWITCH & EARTH GROUND LEVEL. SWITCH OPERATING HANDLES OF ISOLATORS AT A DEPTH OF 300mm BELOW THE FINISHED.
13. AUXILIARY EARTHMAT FOR ISOLATOR & E/S OPERATING MECHANISM SHOWN ARE INDICATIVE ONLY EXACT LOCATION SHALL BE CHANGED TO SUIT SITE CONDITIONS & AS PER APPROVED ISOLATOR DRAWINGS EARTH CONDUCTOR IS LAID.
14. ALL EQUIPMENT EARTHING SHOULD BE DONE AS PER PGCIL STANDARD EARTHING DRAWING NO.-C/ENG/STD/EARTHINGS (SHEET NO.-1 TO 28)
15. EARTHING DETAILS:-
 -MAIN EARTHING CONDUCTOR (EXISTING) 40MM DIA MS ROD BURIED IN GROUND.
 -40MM DIA 3 Mtr. LONG MS ROD ELECTRODE (FOR LA, TOWER WITH PEAK, LM)
 -40MM DIA 3 Mtr. LONG PIPE ELECTRODE IN TREATED PIT WITH CI COVER (TRANSFORMER NEUTRAL)
 -CONDUCTOR ABOVE GROUND & EARTHING LEADS (FOR COLUMN & AUX. STRUCTURES) : 75x12MM GS FLAT.
 -EARTHING OF INDOOR LT PANELS, CONTROL PANELS & OUTDOOR MARSHALLING BOXES, MOM BOXES & LIGHTING PANELS ETC.: 50X6MM GS FLAT.
 -EARTHING CONDUCTOR ALONG OUTDOOR CABLE TRENCHES: 50X6MM MS FLAT.
16. ALL EARTHING SHALL BE DONE IN ACCORDANCE WITH IS:3043 UNLESS OTHERWISE MENTIONED IN THE TECHNICAL SPECIFICATION. (CLAUSE 8.3 Pg:27 SEC-SE)
17. EARTHING CONDUCTORS EMBEDDED IN THE CONCRETE SHALL HAVE APPROXIMATE 50MM. CONCRETE COVER.
18. EARTHING CONDUCTORES OR LEADS ALONG THEIR RUN ON CABLE TRENCH, LADDER, WALLS ETC. SHALL BE SUPPORTED BY SUITABLE WELDING/CLEATING AT INTERVALS OF 750MM. WHENEVER IT PASSES THROUGH WALLS, FLOOR ETC. GALVANIZED IRON SLEEVES SHALL BE PROVIDED FOR THE PASSAGE OF THE CONDUCTOR & BOTH ENDS OF THE SLEEVE SHALL BE SEALED TO PREVENT THE PASSAGE OF WATER THROUGH THE SLEEVES.
19. RAILWAY TRACKS WITHIN SWITCHYARD AREA SHALL BE EARTHED AT A SPACING OF 30 Mtr. & ALSO AT BOTH ENDS.

LEGENDS:-

- EXISTING EARTHMAT (40mm Ø MS ROD)
- RISER CONDUCTOR (40mm Ø MS ROD)
- AUXILIARY EARTHMAT
- ⊙ 40mm DIA 3M LONG MS ROD EARTH ELECTRODE WITH TEST LINK FOR LA & TOWER WITH PEAK
- ⊕ 40mm DIA, 3M LONG GS PIPE EARTH ELECTRODE FOR TRANSFORMER NEUTRAL

KEC REFERENCE DRAWINGS

1. ELECTRICAL LAYOUT PLAN & SECTION DRAWING - KEC-A770-771-FBD-01-0011
2. FOUNDATION LAYOUT PLAN - KEC-A770-771-FBD-90-0001

PGCIL REFERENCE DRAWINGS

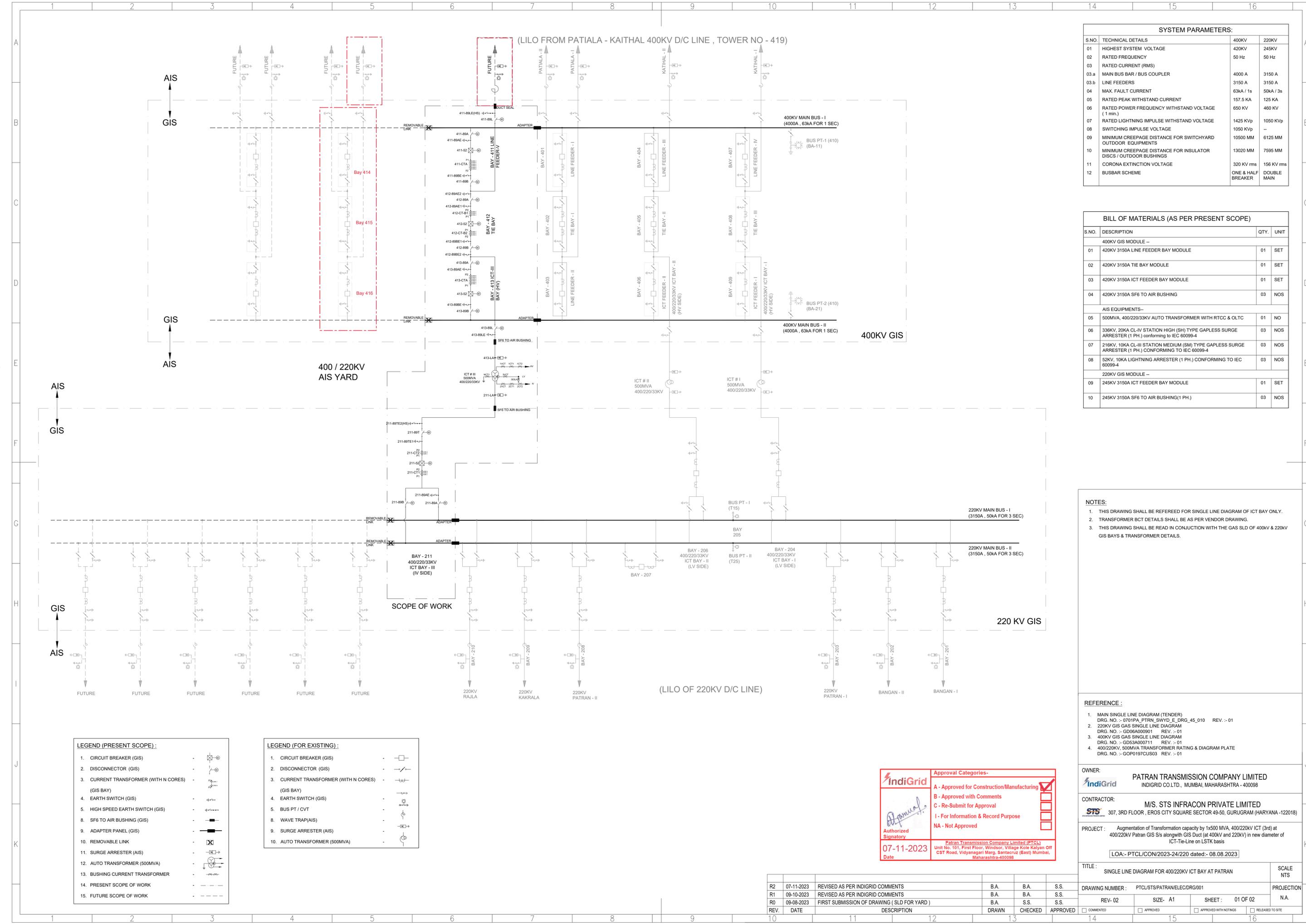
1. GENERAL ARRANGEMENT LAYOUT (TENDER) - C/ENGG/NR-1/ICT-FAT'BAD/FATEHABAD-EXTN./GA/01

AS BUILT

01	AS BUILT	RM	VR	SB	16.07.19	DRG. TITLE	EARTHMAT LAYOUT PLAN
00	FIRST ISSUE	SS	RN	SB	04.01.18	DRG. NO.:	KEC-A770-771-FBD-02-5021
REV.	DESCRIPTION	PREP.	CHEKED.	APPD.	DATE	SCALE- 1:450	JOB NO:
			SIGN.				SHEET: 1 OF 1

CUSTOMER	POWER GRID CORPORATION OF INDIA LTD.
CONTRACTOR	KEC KEC INTERNATIONAL LTD. 8 th FLOOR, BUILDING NO. 9A, DLF CYBER CITY, PHASE II, GURGAON (HARYANA) - 122002
NOA-I : SUPPLY	CC-CS/776-NR1/SS-3553/3/G1/NOA-I/7270
NOA-II : SERVICES	CC-CS/776-NR1/SS-3553/3/G1/NOA-II/7271
SPEC. NO.:	CC-CS/776-NR1/SS-3553/3/G1
PROJECT	AIS SUBSTATION PACKAGE-SS01 FOR A) EXTENSION OF 400W AT 400/220KV BHINMAL S/S & 400/220KV SIKAR S/S AND EXTENSION OF 220KV AT 765/400/220KV FATEHPUR S/S UNDER TRANSMISSION SYSTEM - LINE BAYS ASSOCIATED WITH VARIOUS REGIONAL TWRENGTHENING SCHEMES IN NR. B) EXTENSION OF 220KV AT 400/220KV ROORKEE S/S UNDER NORTHERN REGION SYSTEM TWRENGTHENING SCHEME (ARSS) - XXXVI AND C) AUGMENTATION OF 400/220KV FATEHABAD S/S
SUBSTATION	EXTN. OF 400/220KV ICT BAY AT 400/220KV FATEHABAD (PG) S/S

THIS DRAWING IS THE PROPERTY OF STS INFRACON PVT. LTD. AND CANNOT BE COPIED/USED WITHOUT PRIOR PERMISSION.



(LILO FROM PATIALA - KATHAL 400KV D/C LINE , TOWER NO - 419)

SYSTEM PARAMETERS:			
S.NO.	TECHNICAL DETAILS	400KV	220KV
01	HIGHEST SYSTEM VOLTAGE	420KV	245KV
02	RATED FREQUENCY	50 Hz	50 Hz
03	RATED CURRENT (RMS)		
03a	MAIN BUS BAR / BUS COUPLER	4000 A	3150 A
03b	LINE FEEDERS	3150 A	3150 A
04	MAX. FAULT CURRENT	63kA / 1s	50kA / 3s
05	RATED PEAK WITHSTAND CURRENT	157.5 KA	125 KA
06	RATED POWER FREQUENCY WITHSTAND VOLTAGE (1 min.)	850 KV	460 KV
07	RATED LIGHTNING IMPULSE WITHSTAND VOLTAGE	1425 KVp	1050 KVp
08	SWITCHING IMPULSE VOLTAGE	1050 KVp	--
09	MINIMUM CREEPAGE DISTANCE FOR SWITCHYARD OUTDOOR EQUIPMENTS	10500 MM	6125 MM
10	MINIMUM CREEPAGE DISTANCE FOR INSULATOR DISCS / OUTDOOR BUSHINGS	13020 MM	7595 MM
11	CORONA EXTINCTION VOLTAGE	320 KV rms	156 KV rms
12	BUSBAR SCHEME	ONE & HALF BREAKER	DOUBLE MAIN

BILL OF MATERIALS (AS PER PRESENT SCOPE)			
S.NO.	DESCRIPTION	QTY.	UNIT
400KV GIS MODULE --			
01	420KV 3150A LINE FEEDER BAY MODULE	01	SET
02	420KV 3150A TIE BAY MODULE	01	SET
03	420KV 3150A ICT FEEDER BAY MODULE	01	SET
04	420KV 3150A SF6 TO AIR BUSHING	03	NOS
AIS EQUIPMENTS--			
05	500MVA, 400/220/33KV AUTO TRANSFORMER WITH RTCC & OLTC	01	NO
06	338KV, 20KA CL-IV STATION HIGH (SH) TYPE GAPLESS SURGE ARRESTER (1 PH.) CONFORMING TO IEC 60099-4	03	NOS
07	218KV, 10KA CL-III STATION MEDIUM (SM) TYPE GAPLESS SURGE ARRESTER (1 PH.) CONFORMING TO IEC 60099-4	03	NOS
08	52KV, 10KA LIGHTNING ARRESTER (1 PH.) CONFORMING TO IEC 60099-4	03	NOS
220KV GIS MODULE --			
09	245KV 3150A ICT FEEDER BAY MODULE	01	SET
10	245KV 3150A SF6 TO AIR BUSHING(1 PH.)	03	NOS

NOTES:

- THIS DRAWING SHALL BE REFERRED FOR SINGLE LINE DIAGRAM OF ICT BAY ONLY.
- TRANSFORMER BCT DETAILS SHALL BE AS PER VENDOR DRAWING.
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE GAS SLD OF 400KV & 220KV GIS BAYS & TRANSFORMER DETAILS.

REFERENCE:

- MAIN SINGLE LINE DIAGRAM (TENDER) DRG. NO. - 0701PA_PTRM_SWYD_E_DRG_45_010 REV. -> 01
- 220KV GIS GAS SINGLE LINE DIAGRAM DRG. NO. - GD06A000901 REV. -> 01
- 400KV GIS GAS SINGLE LINE DIAGRAM DRG. NO. - GDS3A000711 REV. -> 01
- 400/220KV, 500MVA TRANSFORMER RATING & DIAGRAM PLATE DRG. NO. - GOP0197CUS03 REV. -> 01

OWNER: PATRAN TRANSMISSION COMPANY LIMITED
 INDI GRID CO. LTD., MUMBAI, MAHARASHTRA - 400098

CONTRACTOR: M/S. STS INFRACON PRIVATE LIMITED
 307, 3RD FLOOR, EROS CITY SQUARE SECTOR 49-50, GURUGRAM (HARYANA -122018)

PROJECT: Augmentation of Transformation capacity by 1x500 MVA, 400/220KV ICT (3rd) at 400/220KV Patran GIS S/s alongwith GIS Duct (at 400KV and 220KV) in new diameter of ICT-Tie-Line on LSTK basis

LOA:- PTCL/CON/2023-24/220 dated:- 08.08.2023

TITLE: SINGLE LINE DIAGRAM FOR 400/220KV ICT BAY AT PATRAN **SCALE:** NTS

DRAWING NUMBER: PTCL/STS/PATRAN/LEC/DRG/001 **PROJECTION:** N.A.

REV. 02 **SIZE- A1** **SHEET:** 01 OF 02

IndiGrid Approval Categories-
 A - Approved for Construction/Manufacturing
 B - Approved with Comments
 C - Re-Submit for Approval
 I - For Information & Record Purpose
 NA - Not Approved

Authorized Signatory
 07-11-2023
 Date

Patran Transmission Company Limited (PTCL)
 Unit No. 101, First Floor, Windsor, Village Kole Kalyan Off
 CST Road, Vidyanagari Marg, Santacruz (East) Mumbai,
 Maharashtra-400098

LEGEND (PRESENT SCOPE):

- CIRCUIT BREAKER (GIS)
- DISCONNECTOR (GIS)
- CURRENT TRANSFORMER (WITH N CORES) (GIS BAY)
- EARTH SWITCH (GIS)
- HIGH SPEED EARTH SWITCH (GIS)
- SF6 TO AIR BUSHING (GIS)
- ADAPTER PANEL (GIS)
- REMOVABLE LINK
- SURGE ARRESTER (AIS)
- AUTO TRANSFORMER (500MVA)
- BUSHING CURRENT TRANSFORMER
- PRESENT SCOPE OF WORK
- FUTURE SCOPE OF WORK

LEGEND (FOR EXISTING):

- CIRCUIT BREAKER (GIS)
- DISCONNECTOR (GIS)
- CURRENT TRANSFORMER (WITH N CORES) (GIS BAY)
- EARTH SWITCH (GIS)
- BUS PT / CVT
- WAVE TRAP(AIS)
- SURGE ARRESTER (AIS)
- AUTO TRANSFORMER (500MVA)

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
R2	07-11-2023	REVISED AS PER INDI GRID COMMENTS	B.A.	B.A.	S.S.
R1	09-10-2023	REVISED AS PER INDI GRID COMMENTS	B.A.	B.A.	S.S.
R0	09-08-2023	FIRST SUBMISSION OF DRAWING (SLD FOR YARD)	B.A.	S.S.	S.S.

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220KV CURRENT TRANSFORMER (As per IEC 61869-2) (Ith = 50kA FOR 3s Idyn = 125kA lcth = 120%)												
CT. NO.	BAY NAME	QUANTITY	CORE IDENTIFICATION	RATIO (A)	ACCURACY	OUTPUT (VA)	ISF	MIN. KPv V _k (V)	MAX Rct (OHMS)	MAX. EXCITATION CURRENT(mA) AT V _k	APPLICATION	
CT-1	220KV ICT BAY (211)	3 NOS	P2	CORE : 3	1600/1 800/1	PX (PS)	--	--	1600 800	8.0 4.0	25 mA 50 mA	PROTECTION
				CORE : 2	1600/1 800/1	PX (PS)	--	--	1600 800	8.0 4.0	25 mA 50 mA	PROTECTION
				CORE : 1	1600/1 800/1	0.2S	40 20	<5	--	--	--	METERING
CT-2		3 NOS	P1 (CB)	CORE : 2	1600/1 800/1	PX (PS)	--	--	1600 800	8.0 4.0	25 mA 50 mA	PROTECTION
			P2 (CB)	CORE : 2	1600/1 800/1	PX (PS)	--	--	1600 800	8.0 4.0	25 mA 50 mA	PROTECTION
			P1	CORE : 1	1600/1 800/1	PX (PS)	--	--	1600 800	8.0 4.0	25 mA 50 mA	PROTECTION

EXISTING 220KV BUSBAR POTENTIAL TRANSFORMER BUS PT (Not in Scope)					
PT BAY. NO.	CORE IDENTIFICATION	RATIO	CLASS	BURDEN	APPLICATION
220KV (BUS PT) =D05 - T15 =D05 - T25	PRIMARY	220kV / √3			
	SECONDARY CORE : 1	110V / √3	3P	50 VA	PROTECTION
	SECONDARY CORE : 2	110V / √3	3P	50 VA	PROTECTION
	SECONDARY CORE : 3	110V / √3	0.2	50 VA	METERING

- ABBREVIATIONS:**
- ISF : INSTRUMENT SAFETY FACTOR
 - KPV : KNEE POINT VOLTAGE
 - ONAN : OIL NATURAL AIR NATURAL
 - ONAF : OIL NATURAL AIR FORCED
 - ODAF : OIL DIRECTED AIR FORCED

400KV CURRENT TRANSFORMER (As per IEC 61869-2) (Ith = 63kA FOR 1s Idyn = 157.5kA lcth = 120% lext = lcth)												
CT. NO.	BAY NAME	QUANTITY	CORE IDENTIFICATION	RATIO (A)	ACCURACY	OUTPUT (VA)	ISF	MIN. KPv V _k (V)	MAX Rct (OHMS)	MAX. EXCITATION CURRENT(mA) @ V _k	APPLICATION	
CT-A	LINE BAY (411) & TRAF0 BAY (413)	6 NOS	P1 (CB)	CORE : 1	3000/1 2000/1 500/1	PX	--	--	3000 2000 500	15 10 2.5	20 mA 30 mA 120 mA	PROTECTION
				CORE : 2	3000/1 2000/1 500/1	PX	--	--	3000 2000 500	15 10 2.5	20 mA 30 mA 120 mA	PROTECTION
				CORE : 3	3000/1 2000/1 500/1	0.2S	20 13.5 3.5	≤ 5	--	--	--	METERING
			P2	CORE : 4	3000/1 2000/1 500/1	0.2S	20 13.5 3.5	≤ 5	--	--	--	METERING
				CORE : 5	3000/1 2000/1 500/1	PX	--	--	3000 2000 500	15 10 2.5	20 mA 30 mA 120 mA	PROTECTION
				CORE : 6	3000/1 2000/1 500/1	PX	--	--	3000 2000 500	15 10 2.5	20 mA 30 mA 120 mA	PROTECTION
CT-B1 & CT-B2	TIE BAY (411)	6 NOS	P1 (CB)	CORE : 1	3000/1 2000/1 500/1	PX	--	--	3000 2000 500	15 10 2.5	20 mA 30 mA 120 mA	PROTECTION
				CORE : 2	3000/1 2000/1 500/1	PX	--	--	3000 2000 500	15 10 2.5	20 mA 30 mA 120 mA	PROTECTION
				CORE : 3	3000/1 2000/1 500/1	0.2S	20 13.5 3.5	≤ 5	--	--	--	METERING

EXISTING 400KV BUSBAR POTENTIAL TRANSFORMER BUS PT (Not in Scope)					
PT BAY. NO.	CORE IDENTIFICATION	RATIO	CLASS	BURDEN	APPLICATION
C03 (BUS PT) =BA11 =BA21	PRIMARY	400kV / √3			
	SECONDARY CORE : 1	110V / √3	3P / 0.5	50 VA	PROTECTION
	SECONDARY CORE : 2	110V / √3	3P / 0.5	50 VA	PROTECTION
	SECONDARY CORE : 3	110V / √3	0.2	50 VA	METERING

- NOTES :**
- CT DETAILS ARE PROVIDED AS PER VENDOR GAS SLD.
 - PT DETAILS ARE PROVIDED AS PER EXISTING DATA.

  Authorized Signatory 07-11-2023 Date	Approval Categories-
	A - Approved for Construction/Manufacturing <input checked="" type="checkbox"/>
	B - Approved with Comments <input type="checkbox"/>
	C - Re-Submit for Approval <input type="checkbox"/>
	I - For Information & Record Purpose <input type="checkbox"/>
	NA - Not Approved <input type="checkbox"/>
	Patran Transmission Company Limited (PTCL) Unit No. 101, First Floor, Windsor, Village Kule Kalyan Off CST Road, Vidyanagari Marg, Santacruz (East) Mumbai, Maharashtra-400098

- REFERENCE :**
- MAIN SINGLE LINE DIAGRAM (TENDER)
DRG. NO. :- 0701PA_PTRN_SWYD_E_DRG_45_010 REV. :- 01
 - 220KV GIS GAS SINGLE LINE DIAGRAM
DRG. NO. :- GD06A000901 REV. :- 00
 - 400KV GIS GAS SINGLE LINE DIAGRAM
DRG. NO. :- GD53A000711 REV. :- 00
 - 400/220KV, 500MVA TRANSFORMER RATING & DIAGRAM PLATE
DRG. NO. :- GOP0197CUS03 REV. :- 01

BUSHING CURRENT TRANSFORMER (As per IEC : 61869-2 & IS : 2705)									
BUSHING TYPE	NOMENCLATURE OF CORES	RATIO (A)	ACCURACY	OUTPUT (VA)	ISF	MIN. KPv V _k (V)	MAX. Rct (OHMS)	MAX. EXCITATION CURRENT(mA) AT V _k	APPLICATION
HV BUSHING (400KV)	1CT1 (CORE : 1)	1600/1	PS	--	--	1600	4.0	25 mA	REF. PROTECTION
	1CT2 (CORE : 2)	1000/1	0.2S	20	≤ 5	--	--	--	METERING
	1VCT (Y PHASE CORE)	805 / 1.5-1.75-2	3	20	--	--	--	--	WTI
IV BUSHING (220KV)	2CT1 (CORE : 1)	1600/1	PS	--	--	1600	4.0	25 mA	REF. PROTECTION
	2CT2 (CORE : 2)	1600/1	0.2S	20	≤ 5	--	--	--	METERING
	2VCT (Y PHASE CORE)	1320 / 1.5-1.75-2	3	20	--	--	--	--	WTI
LV BUSHING (33KV)	3VCT (Y PHASE CORE)	90 / 1.5-1.75-2	PS	20	--	--	--	--	WTI
NEUTRAL BUSHING	NCT1	1600/1	PS	--	--	1600	4.0	25 mA	REF. PROTECTION

500MVA TRANSFORMER DETAILS				
DESCRIPTION OF PARAMETERS	PARAMETER DETAILS			
TYPE OF TRANSFORMER	AUTO TRANSFORMER			
VECTOR GROUP	YN0d11			
RATED VOLTAGE (HV / IV / LV)	400KV / 220KV / 33KV			
TYPE OF COOLING	ONAN	ONAF	ODAF	
RATED CURRENT	HV	433 A	577.4 A	721.7 A
	IV	787.3 A	1049.7 A	1312.2 A
	LV	87.5 A	87.5 A	87.5 A
RATED POWER	HV & IV	300 MVA	400 MVA	500 MVA
	IV	5 MVA	5 MVA	5 MVA

OWNER:  **PATRAN TRANSMISSION COMPANY LIMITED**
INDIGRID CO.LTD., MUMBAI, MAHARASHTRA - 400098

CONTRACTOR:  **M/S. STS INFRACON PRIVATE LIMITED**
307, 3RD FLOOR, EROS CITY SQUARE SECTOR 49-50, GURUGRAM (HARYANA -122018)

PROJECT : Augmentation of Transformation capacity by 1x500 MVA, 400/220KV ICT (3rd) at 400/220kV Patran GIS S/s alongwith GIS Duct (at 400kV and 220kV) in new diameter of ICT-Tie-Line on LSTK basis

LOA:- PTCL/CON/2023-24/220 dated:- 08.08.2023

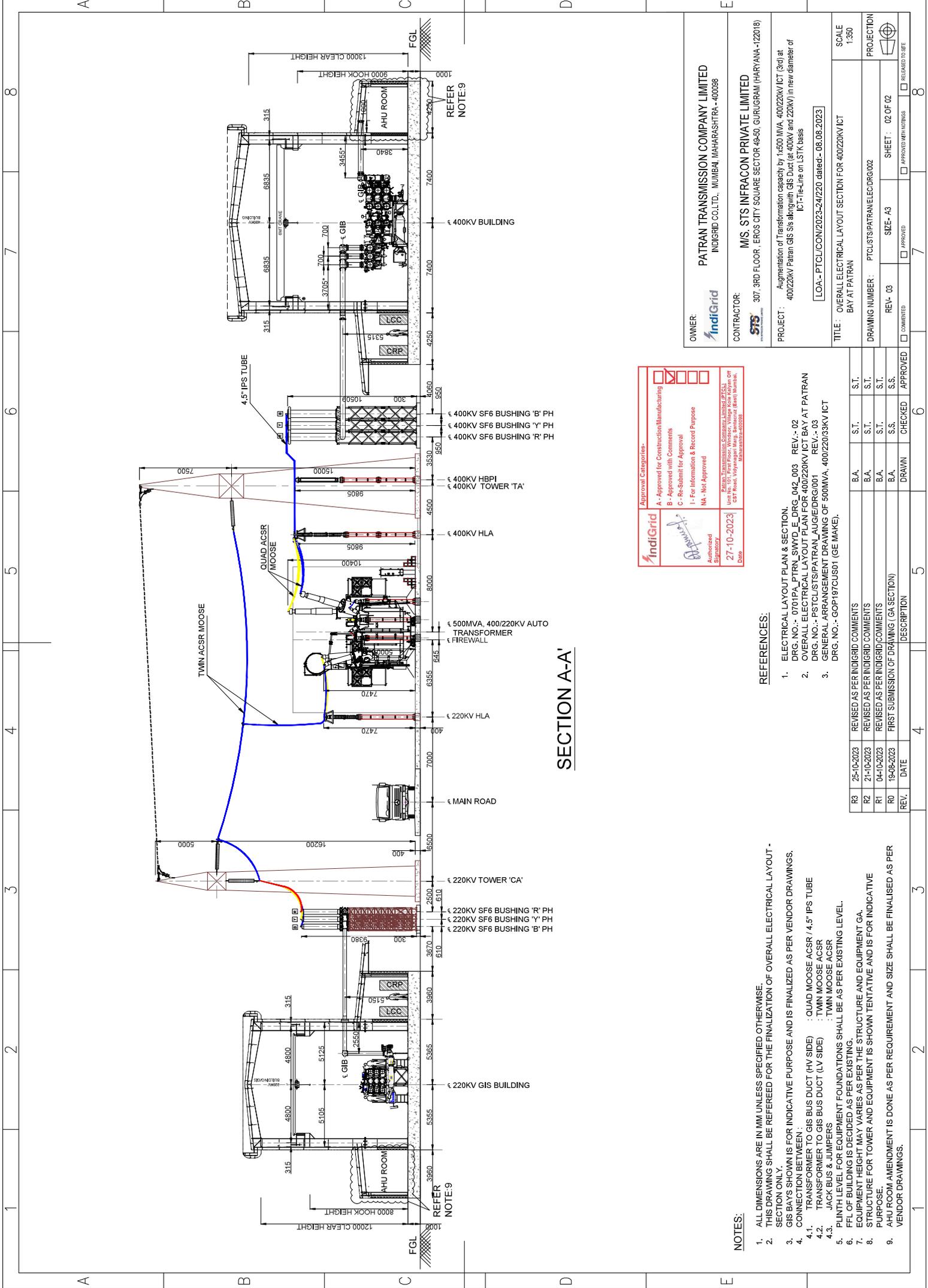
TITLE : SINGLE LINE DIAGRAM FOR 400/220KV ICT BAY AT PATRAN SCALE NTS

DRAWING NUMBER : PTCL/STS/PATRAN/ELEC/DRG/001 PROJECTION N.A.

REV- 02 SIZE- A3 SHEET : 02 OF 02

COMMENTED APPROVED APPROVED WITH NOTINGS RELEASED TO SITE

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
R2	07-11-2023	REVISED AS PER INDIGRID COMMENTS	B.A.	B.A.	S.S.
R1	09-10-2023	REVISED AS PER INDIGRID COMMENTS	B.A.	B.A.	S.S.
R0	09-08-2023	FIRST SUBMISSION OF DRAWING	B.A.	B.A.	S.S.



SECTION A-A'

NOTES:

- ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED OTHERWISE
- THIS DRAWING SHALL BE REFERRED FOR THE FINALIZATION OF OVERALL ELECTRICAL LAYOUT - SECTION ONLY
- GIS BAYS SHOWN IS FOR INDICATIVE PURPOSE AND IS FINALIZED AS PER VENDOR DRAWINGS.
- CONNECTION BETWEEN:
 1. TRANSFORMER TO GIS BUS DUCT (HV SIDE) : QUAD MOOSE ACSR / 4.5" IPS TUBE
 2. TRANSFORMER TO GIS BUS DUCT (LV SIDE) : TWIN MOOSE ACSR
 3. JACK BUS & JUMPERS : TWIN MOOSE ACSR
- PLINTH LEVEL FOR EQUIPMENT FOUNDATIONS SHALL BE AS PER EXISTING LEVEL.
- FLL OF BUILDING IS DECIDED AS PER EXISTING.
- EQUIPMENT HEIGHT MAY VARY AS PER THE STRUCTURE AND EQUIPMENT GA.
- STRUCTURE FOR TOWER AND EQUIPMENT IS SHOWN TENTATIVE AND IS FOR INDICATIVE PURPOSE.
- AHU ROOM AMENDMENT IS DONE AS PER REQUIREMENT AND SIZE SHALL BE FINALISED AS PER VENDOR DRAWINGS.

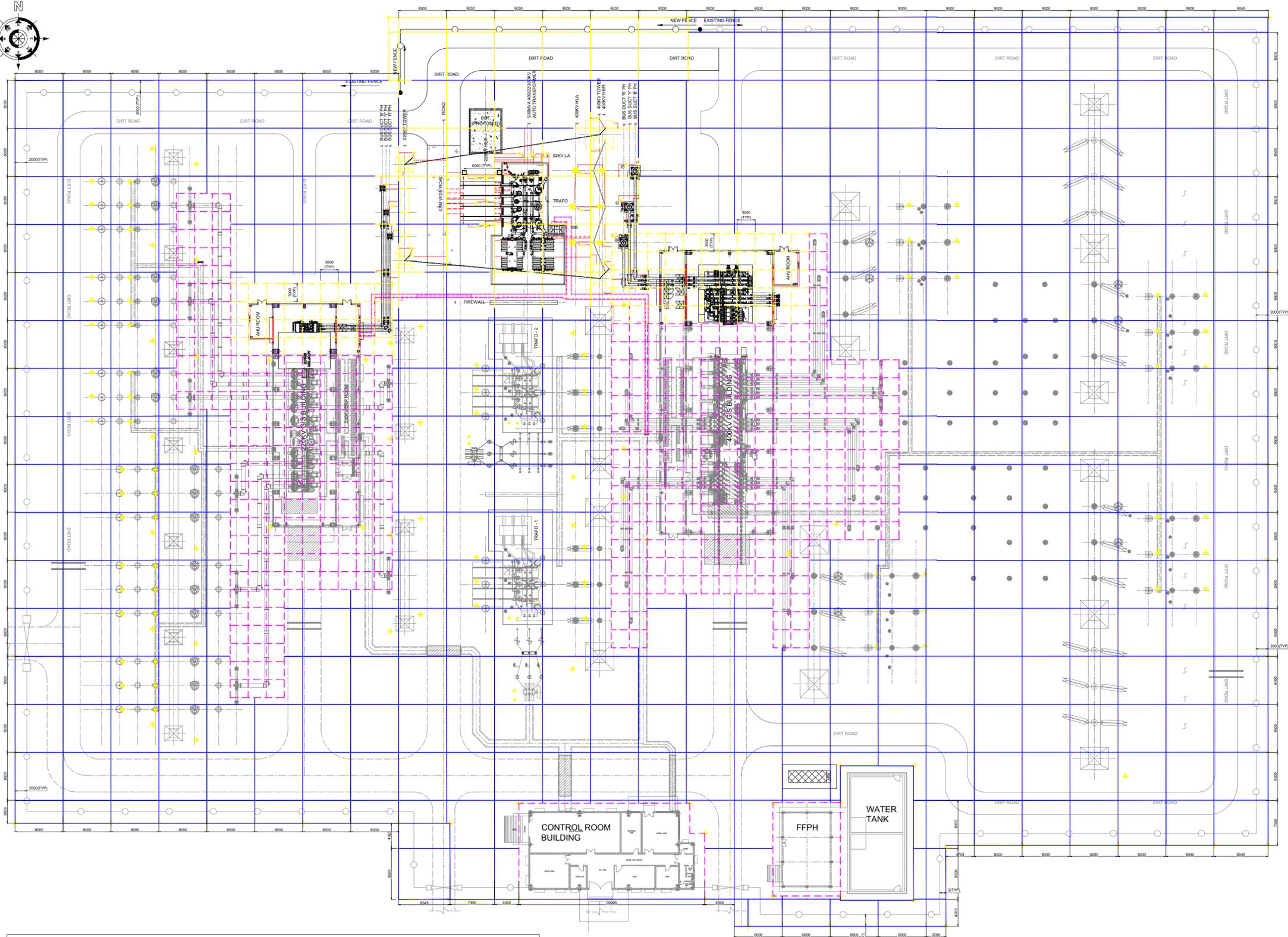
Approval Categories- <input checked="" type="checkbox"/> A - Approved for Construction/Manufacturing <input checked="" type="checkbox"/> B - Approved with Comments <input checked="" type="checkbox"/> C - Re-Submit for Approval <input type="checkbox"/> I - For Information & Record Purpose <input type="checkbox"/> NA - Not Approved	
IndiGrid Authorized Signatory Date: 27-10-2023	STS Infrastructure Company Limited (PVT.) Unit No. 03, First Floor, Winkal, Village Koka Kalayani Off CSF Road, Vajrapuram Mang. Sanstha, (B) Mumbai. 400014 (INDIA)

REFERENCES:

- ELECTRICAL LAYOUT PLAN & SECTION.
DRG. NO.:- 0701PA_PTRN_SWYD_E_DRG_042_003 REV.- 02
- OVERALL ELECTRICAL LAYOUT PLAN FOR 400/220KV ICT BAY AT PATRAN
DRG. NO.:- PSTCL/STS/PATRAN_AUG/DRG/001 REV.- 03
- GENERAL ARRANGEMENT DRAWING OF 500MVA, 400/220/33KV ICT
DRG. NO.:- GOP197C/S01 (GE MAKE).

OWNER: IndiGrid PATRAN TRANSMISSION COMPANY LIMITED INDIGRID COLTD., MUMBAI, MAHARASHTRA - 400098	CONTRACTOR: STS MIS. STS INFRACON PRIVATE LIMITED 307, 3RD FLOOR, EROS CITY SQUARE SECTOR 49-50, GURUGRAM (HARYANA -120018)
PROJECT: Augmentation of Transformation capacity by 1x500 MVA, 400/220KV ICT (3rd) at 400/220KV Patran GIS S/s alongwith GIS Duct at 400KV and 220KV in new diameter of ICT-116-Line on LSTK basis [LOA:- PTCL/CON/2023-24/220 dated:- 08.08.2023]	TITLE: OVERALL ELECTRICAL LAYOUT SECTION FOR 400/220KV ICT BAY AT PATRAN
DRAWING NUMBER: PTCL/STS/PATRAN/LEC/DRG/002	SCALE: 1:350
REV. 03 SHEET: 02 OF 02	PROJECTION: FIRST ANGLE
CHECKED: [] DRAWN: []	APPROVED: [] RELEASED TO SITE: []

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
R3	25-10-2023	REVISED AS PER INDIGRID COMMENTS	B.A.	S.T.	S.T.
R2	21-10-2023	REVISED AS PER INDIGRID COMMENTS	B.A.	S.T.	S.T.
R1	04-10-2023	REVISED AS PER INDIGRID COMMENTS	B.A.	S.T.	S.T.
R0	19-08-2023	FIRST SUBMISSION OF DRAWING (GA SECTION)	B.A.	S.S.	S.S.



NOTES:

- ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED OTHERWISE.
- THIS DRAWING SHALL BE REFERRED FOR EARTHMAT LAYOUT EXTENSION FOR 400/220KV ICT YARD AREA.
- THIS EXTENSION IS SHOWN FOR INDICATIVE PURPOSE, ACTUAL ROUTING OF EARTHING CONDUCTOR MAY Varies AS PER SITE CONDITIONS.
- DEPTH OF MAIN EARTHMAT SHALL BE 600MM FROM FGL.
- CRUSHED ROSCK OF 100MM THICKNESS WILL BE PROVIDED NEARBY THE EQUIPMENTS.
- EARTHING CONDUCTORS RUNNING BELOW CABLE TRENCHES, DRAINS, ROADS & RAIL WILL BE LAID 300MM BELOW THE BOTTOM OF THESE STRUCTURES.
- EARTHMAT SHALL BE LAID MINIMUM 1.5M OUTSIDE THE BUILDING PARAMETER. 400KV & 220KV GIS BUILDING SHALL HAVE SEPARATE MAINMAT IN THE LOOSE SOIL BELOW THE CONCRETE FLOORING.
- NEW EARTHMAT SHALL BE PROPERLY WELDED WITH THE EXISTING EARTHMAT AND THE WELDING JOINTS SHALL BE PROTECTED FROM ANTI CORROSIVE PAINTS.
- ALL EQUIPMENT STRUCTURES, TOWERS, TRANSFORMERS SHALL BE CONNECTED TO ATLEAST TWO NEARBY EARTH RODS & IN TWO DIFFRENT DIRECTIONS.
- FOR EQUIPMENT & STRUCTURE EARTHING CONNECTIONS SHALL BE AS PER PGCL STANDARD (DRAWING NO. C/ENG/STD/EARTHINGS/09)
- FOR GIS AND GIB SUPPORT STRUCTURE, PLEASE REFER GE DRAWINGS FOR EARTHING.

REFERENCES:

- ELECTRICAL LAYOUT PLAN & SECTION. DRG. NO.: 0701PA_PTRN_SWYD_E_DRG_042_003 REV.: 02
- SINGLE LINE DIAGRAM FOR 400/220KV ICT BAY AT PATRAN DRG. NO.: PTCL / STS / PATRAN / E / DRG / 001 REV.: 02
- GENERAL ARRANGEMENT DRAWING OF 500MVA, 400/220/33KV ICT DRG. NO.: GOP197CUS01 (GE MAKE).

THIS DRAWING IS THE PROPERTY OF STS INFRACON PVT. LTD. AND CANNOT BE COPIED/USED WITHOUT PRIOR PERMISSION.

EARTHING BOQ FOR NEW 400/220KV ICT BAY YARD AREA

LEGEND	DESCRIPTION	QUANTITY	REMARKS
	MAIN EARTHING CONDUCTOR (NEW)	1600 MTR.	NECESSARY AUGMENTATION OF MAIN ROD WILL BE DONE (INCLUDING RISERS)
	75 X 12 MM GS FLAT FOR EQUIPMENT CONN.	150	EST. QUANTITY FOR EQUIPMENT CONNECTION WITH MAIN EARTHMAT
	50 X 6 MM GS FLAT FOR EQUIPMENT CONN.	180	EST. QUANTITY FOR EQUIPMENT CONNECTION WITH MAIN EARTHMAT
	PIPE ELECTRODE WITH TREATED EARTH PIT (3 MTR. LONG, 40MM DIA GI PIPE)	02 Nos	FOR AUTO TRANSFORMER
	ROD ELECTRODE (3 MTR. LONG, 40MM DIA MS ROD)	32 Nos	FOR BUILDING PERIPHERY, MAIN MAT PERIPHERY, EARTHING OF DOWN CONDUCTOR OF LA & TOWER PEAK, SF6 BUSHING.
	CLEAT CLAMPS FOR 75 X 12MM GS FLAT	60 Nos	SUPPORT BETWEEN FLAT AND STRUCTURE

EXISTING EARTHING BOQ

LEGEND	DESCRIPTION	QUANTITY	REMARKS
	MAIN EARTHING CONDUCTOR(EXISTING)	10900 MTR.	--- EXISTING ---
	PIPE ELECTRODE WITH TREATED EARTH PIT (3 MTR. LONG, 40MM DIA GI PIPE)	10 Nos	--- EXISTING ---
	ROD ELECTRODE (3 MTR. LONG, 40MM DIA MS ROD)	190 Nos	--- EXISTING ---

RO	30-11-2023	FIRST SUBMISSION OF DRAWING (GA PLAN)	B.A.	B.A.	S.T.
REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED

OWNER: PATRAN TRANSMISSION COMPANY LIMITED
 INDIGRID CO.LTD., MUMBAI, MAHARASHTRA - 400098

CONTRACTOR: M/S. STS INFRACON PRIVATE LIMITED
 307, 3RD FLOOR, EROS CITY SQUARE SECTOR 49-50, GURUGRAM (HARYANA -122018)

PROJECT: Augmentation of Transformation capacity by 1x500 MVA, 400/220KV ICT (3rd) at 400/220KV Patran GIS S/s alongwith GIS Duct (at 400KV and 220KV) in new diameter of ICT-Tie-Line on LSTK basis

LOA:- PTCL/CON/2023-24/220 dated:- 08.08.2023

TITLE: OVERALL EARTHING LAYOUT EXTENSION FOR PATRAN

SCALE: 1:350

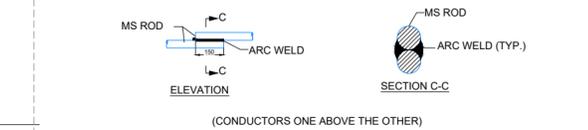
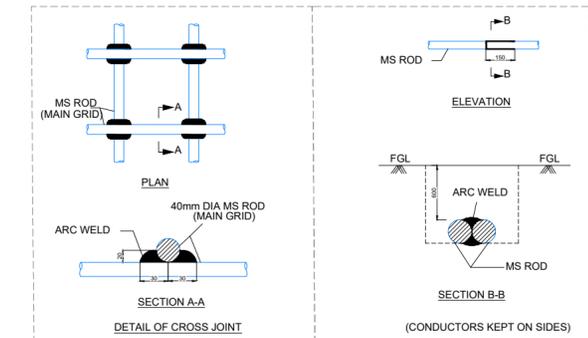
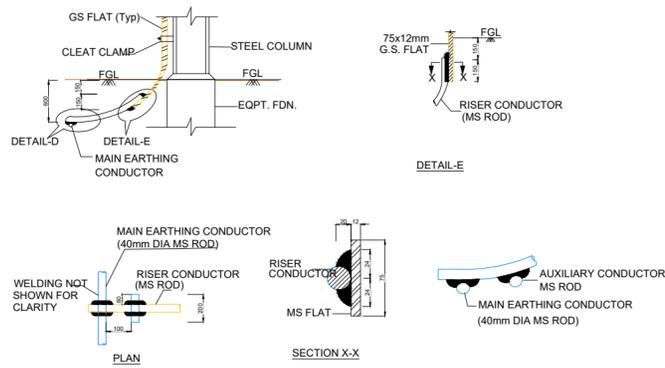
DRAWING NUMBER: PTCL/STS/PATRANELEC/DRG/38

PROJECTION:

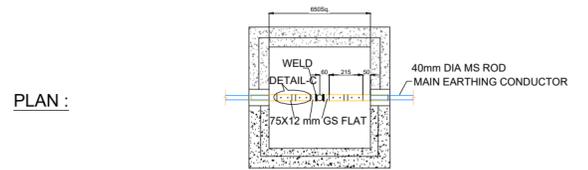
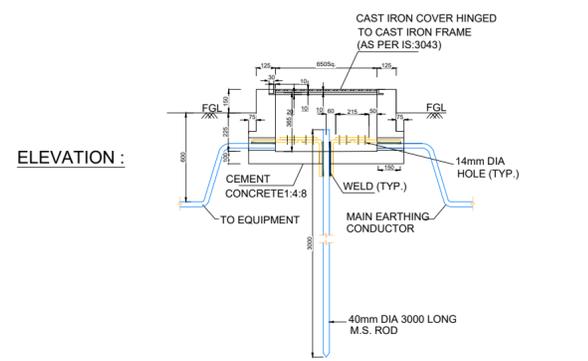
REV-00 SIZE- A1 SHEET: 01 OF 03

COMMENTED APPROVED APPROVED WITH NOTINGS RELEASED TO SITE

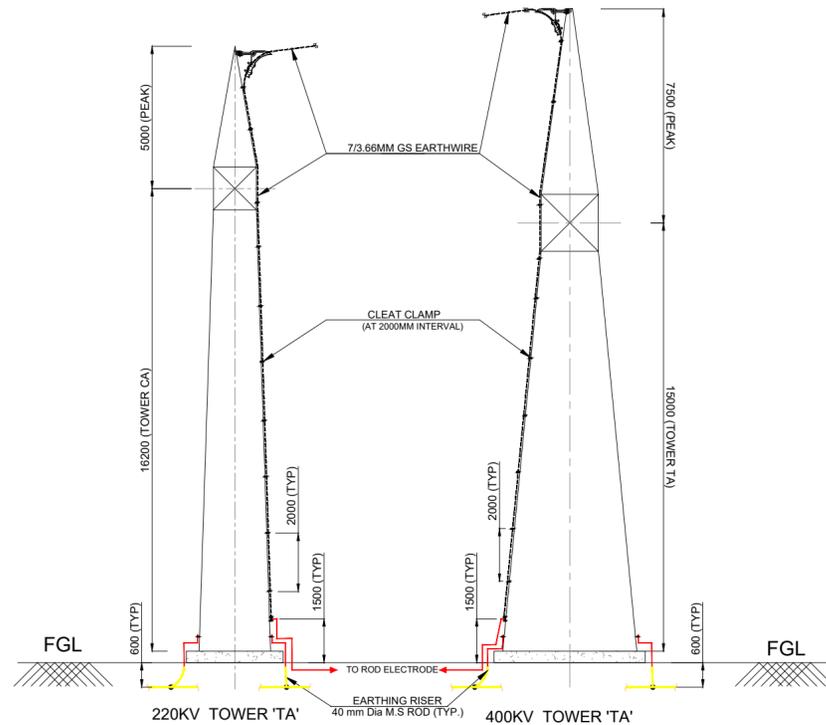
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TYPICAL RISERS DETAILS & LAP JOINTS

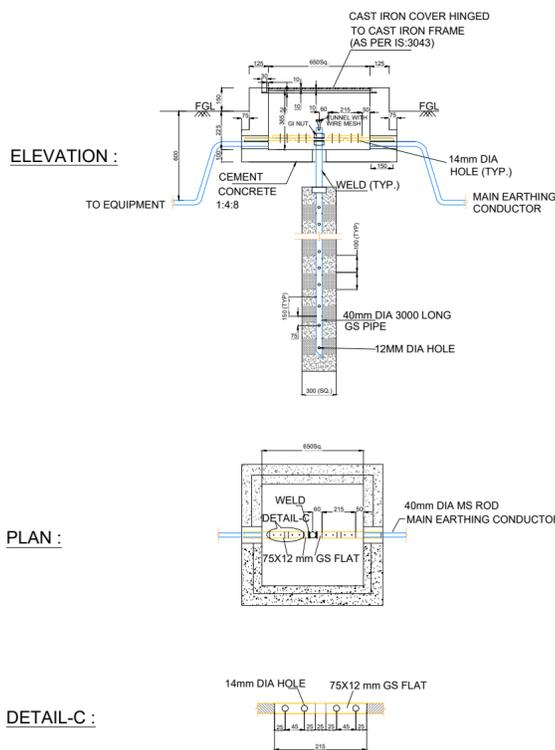


DETAILS OF ROD ELECTRODE WITH EARTHPIIT (IF REQUIRED)

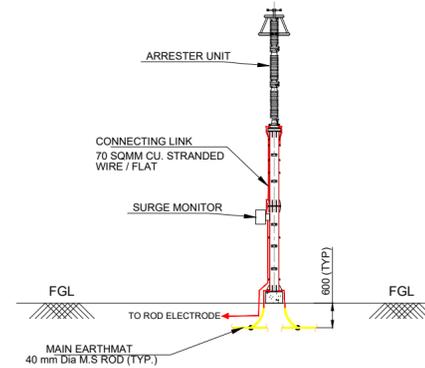


1. NO. OF RISER : 3Nos.
2. NO. OF ROD ELECTRODE = 1No
3. CLEAT CLAMP SHALL BE PROVIDED AT 2000MM INTERVAL FOR GS EARTHWIRE.

EARTHING DETAILS FOR TOWERS

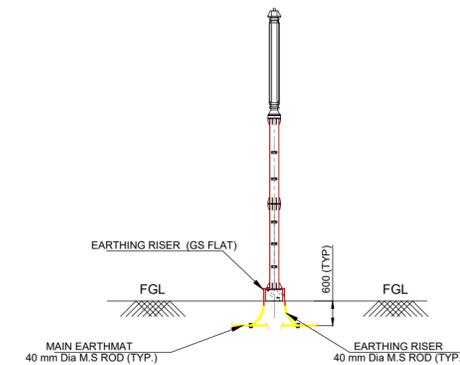


DETAILS OF PIPE ELECTRODE WITH TREATED EARTHPIIT



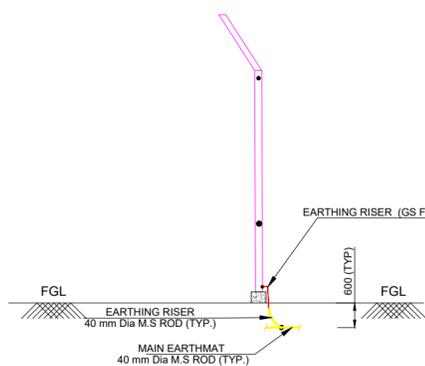
1. NO. OF RISER : 3Nos./Phase
2. NO. OF ROD ELECTRODE = 1No./PHASE.
3. CLEAT CLAMP SHALL BE PROVIDED AT 1000MM INTERVAL.

EARTHING DETAILS FOR BPI



1. NO. OF RISER : 3Nos./Phase
2. NO. OF ROD ELECTRODE = 1No./PHASE.
3. CLEAT CLAMP SHALL BE PROVIDED AT 1000MM INTERVAL.

EARTHING DETAILS FOR LA



1. NO. OF RISERS = 1No./POLE

EARTHING DETAILS FOR FENCE

NOTES :

1. THIS DRAWING SHALL BE REFERRED FOR EQUIPMENT EARTHING DETAILS ONLY.
2. ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED OTHERWISE.
3. LOCATION OF EARTHING CONDUCTORS/RISERS SHOWN IN THE EARTHING DRAWING IS FOR INDICATIVE PURPOSE & MAY VARIES TO SUIT THE SITE CONDITIONS.
4. TWO DIFFERENT RISERS OF ONE STRUCTURE/EQUIPMENT SHALL BE CONNECTED TO DIFFERENT CONDUCTORS OF MAIN EARTHMAT.
5. TYPICAL EQUIPMENT EARTHING CONNECTION SHALL BE DONE VIA 75X10MM GS FLAT CLAMPED AT 1000MM INTERVAL (TYP.)
6. EARTHING CONDUCTOR AROUND THE BUILDING SHALL BE BURIED AT A MINIMUM DISTANCE OF 1500MM FROM THE OUTER BOUNDARY OF THE BUILDING.
7. FOR SURGE ARRESTER, EARTHING LEAD FROM SURGE COUNTER TO TO MAIN EARTHMAT SHALL BE SHORTEST IN LENGTH AS PRACTICALLY AS POSSIBLE. EARTHING LEAD FROM SURGE ARRESTER SHALL NOT BE PASSED THROUGH ANY PIPE.
8. EARTHING WELDING/JOINING SHALL BE DONE AS PER SITE REQUIREMENT.
9. DEPTH OF EARTHMAT SHALL BE 600MM BELOW GROUND LEVEL.
10. EQUIPMENT SHOWN IN LAYOUT IS FOR SYMBOLIC REPRESENTATION AND DOESN'T REPRESENT ACTUAL EQUIPMENT GA.
11. EARTHING RISERS OF 40MM DIA MS ROD AT EVERY JOINING SHALL BE GIVEN UPTO CERTAIN HEIGHT.

REFERENCES:

1. PGCIL STANDARD FOR EARTHING DRAWING NO. C/ENG/STD/EARTHINGS/09

LEGEND	DESCRIPTION
	MAIN EARTHING CONDUCTOR (NEW)
	75 X 12 MM GS FLAT FOR EQUIPMENT CONN.
	50 X 6 MM GS FLAT FOR EQUIPMENT CONN.
	PIPE ELECTRODE WITH TREATED EARTHPIIT (3 MTR. LONG, 40MM DIA GI PIPE)
	ROD ELECTRODE (3 MTR. LONG, 40MM DIA MS ROD)
	7/3.66MM GS EARTHWIRE

OWNER: **IndiGrid** PATRAN TRANSMISSION COMPANY LIMITED
INDIGRID CO.LTD., MUMBAI, MAHARASHTRA - 400098

CONTRACTOR: **STS** M/S. STS INFRACON PRIVATE LIMITED
307, 3RD FLOOR, EROS CITY SQUARE SECTOR 49-50, GURUGRAM (HARYANA -122018)

PROJECT: Augmentation of Transformation capacity by 1x500 MVA, 400/220kV ICT (3rd) at 400/220kV Patran GIS S/s alongwith GIS Duct (at 400kV and 220kV) in new diameter of ICT-Tie-Line on LSTK basis

LOA:- PTCL/CON/2023-24/220 dated:- 08.08.2023

TITLE: OVERALL EARTHING LAYOUT EXTENSION AT PATRAN

SCALE NTS

DRAWING NUMBER: PTCL/STS/PATRAN/CIV/DRG/38

PROJECTION

REV- 00 SIZE- A2 SHEET: 02 OF 03

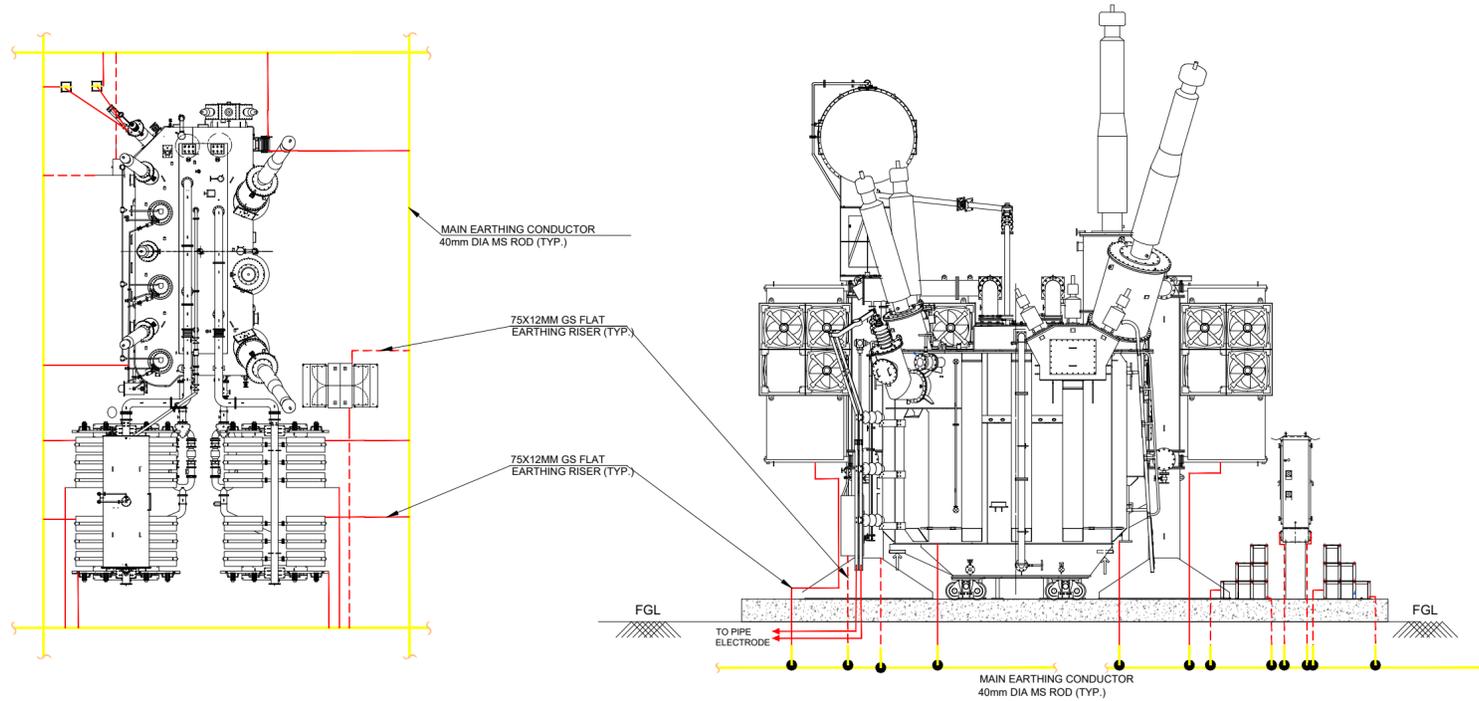
REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
R0	30-11-2023	FIRST SUBMISSION OF DRAWING	B.A.	B.A.	S.T.

COMMENTED APPROVED APPROVED WITH NOTINGS RELEASED TO SITE

THIS DRAWING IS THE PROPERTY OF STS INFRACON PVT. LTD. AND CANNOT BE COPIED/USED WITHOUT PRIOR PERMISSION.

EARTHING DETAILS OF TYPICAL POWER TRANSFORMER

1. NO. OF RISERS FOR MAIN TANK & LADDER = 4 NOS.
2. NO. OF RISERS FOR OLTC = 2 NOS.
3. NO. OF RISERS FOR RADIATORS = 8 NOS.
4. NO. OF RISERS FOR NEUTRAL BUSHING = 2 NOS.
5. NO. OF PIPE ELECTRODE FOR NEUTRAL BUSHING = 2 NOS.
6. NO. OF RISERS FOR PYLONS = AS PER REQUIREMENT
7. CLEAT CLAMP SHALL BE PROVIDED AT 1000MM INTERVAL.

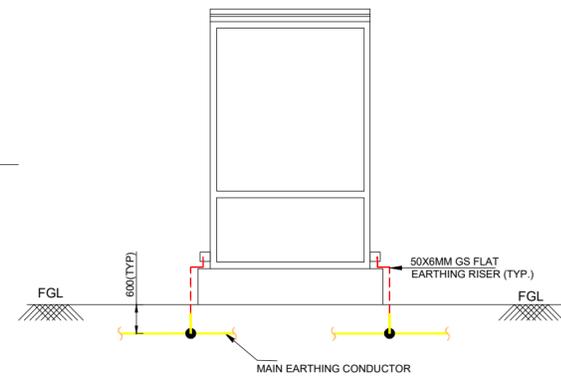


NOTES :

1. THIS DRAWING SHALL BE REFERRED FOR EQUIPMENT EARTHING DETAILS ONLY.
2. ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED OTHERWISE.
3. LOCATION OF EARTHING CONDUCTORS/RISERS SHOWN IN THE EARTHING DRAWING IS FOR INDICATIVE PURPOSE & MAY VARIES TO SUIT THE SITE CONDITIONS.
4. TWO DIFFERENT RISERS OF ONE STRUCTURE/EQUIPMENT SHALL BE CONNECTED TO DIFFERENT CONDUCTORS OF MAIN EARTH MAT.
5. TYPICAL EQUIPMENT EARTHING CONNECTION SHALL BE DONE VIA 75X10MM GS FLAT CLAMPED AT 1000MM INTERVAL (TYP.)
6. EARTHING CONDUCTOR AROUND THE BUILDING SHALL BE BURIED AT A MINIMUM DISTANCE OF 1500MM FROM THE OUTER BOUNDARY OF THE BUILDING.
7. FOR SURGE ARRESTER, EARTHING LEAD FROM SURGE COUNTER TO TO MAIN EARTH MAT SHALL BE SHORTEST IN LENGTH AS PRACTICALLY AS POSSIBLE. EARTHING LEAD FROM SURGE ARRESTER SHALL NOT BE PASSED THROUGH ANY PIPE.
8. EARTHING WELDING/JOINING SHALL BE DONE AS PER SITE REQUIREMENT.
9. DEPTH OF EARTH MAT SHALL BE 600MM BELOW GROUND LEVEL.
10. EQUIPMENT SHOWN IN LAYOUT IS FOR SYMBOLIC REPRESENTATION AND DOESN'T REPRESENT ACTUAL EQUIPMENT GA.
11. EARTHING RISERS OF 40MM DIA MS ROD AT EVERY JOINING SHALL BE GIVEN UPTO CERTAIN HEIGHT.

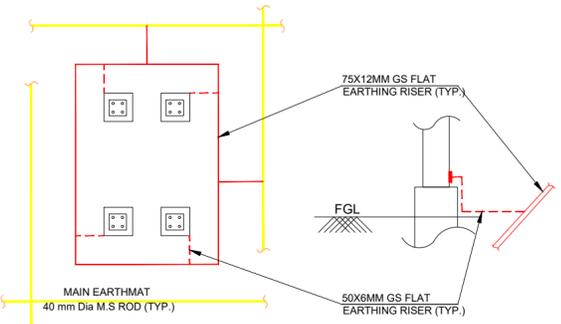
REFERENCES:

1. PGCIL STANDARD FOR EARTHING DRAWING NO. C/ENG/STD/EARTHINGS/09



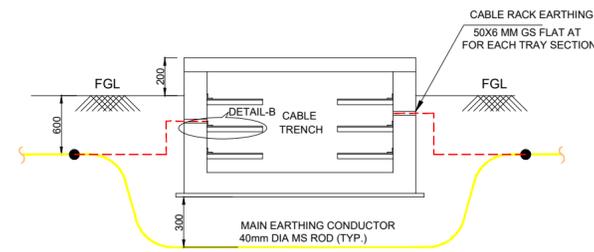
1. NO. OF RISERS = 2 Nos.

EARTHING DETAILS OF MARSHALLING BOXES

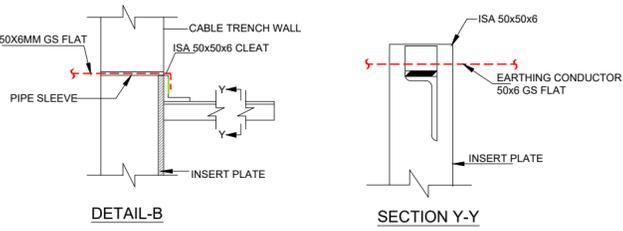


1. PYLON SUPPORTS SHALL BE GROUNDED THROUGH 50X6 MM GS FLAT TO THE RING AROUND PYLON SUPPORTS OF 75 X 12MM GS FLAT WHICH IN TURN IS CONNECTED TO THE MAIN GRID AT 2-3 POINTS.

EARTHING DETAILS OF PYLON SUPPORTS

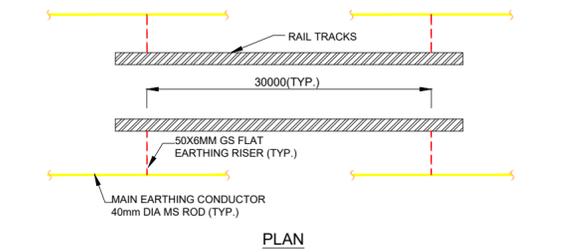


TYPICAL DETAIL OF EARTH BUS CROSSING CABLE TRENCH

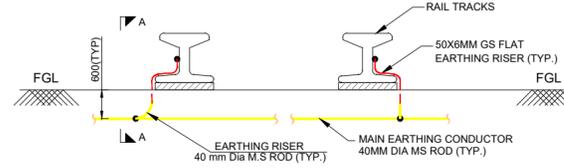


1. GS FLAT SHALL RUN ON TOP TIER ALL ALONG THE CABLE TRENCHES & WELDED TO EACH OF THE RACKS.
2. GS FLAT SHALL BE EARTHED AT 30M INTERVAL AND ALSO AT BOTH ENDS.

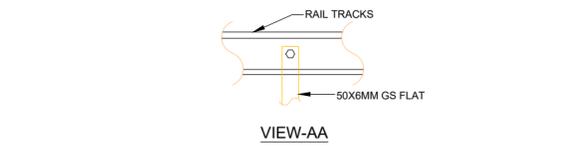
EARTHING DETAILS OF CABLE TRENCH (TYP)



PLAN



ELEVATION



VIEW-AA

1. NO. OF RISER PER SEGMENT : 2 Nos.
2. EACH RAIL SHALL BE EARTHED AT 30M INTERVAL(TYP) AND ALSO AT BOTH ENDS.

EARTHING DETAILS OF RAIL TRACK

LEGEND	DESCRIPTION
	MAIN EARTHING CONDUCTOR (NEW)
	75 X 12 MM GS FLAT FOR EQUIPMENT CONN.
	50 X 6 MM GS FLAT FOR EQUIPMENT CONN.
	PIPE ELECTRODE WITH TREATED EARTH PIT (3 MTR. LONG, 40MM DIA GI PIPE)
	ROD ELECTRODE (3 MTR. LONG, 40MM DIA MS ROD)
	7/3.66MM GS EARTH WIRE

OWNER: **IndiGrid** PATRAN TRANSMISSION COMPANY LIMITED
INDIGRID CO.LTD., MUMBAI, MAHARASHTRA - 400098

CONTRACTOR: **STS** M/S. STS INFRACON PRIVATE LIMITED
307, 3RD FLOOR, EROS CITY SQUARE SECTOR 49-50, GURUGRAM (HARYANA -122018)

PROJECT: Augmentation of Transformation capacity by 1x500 MVA, 400/220kV ICT (3rd) at 400/220kV Patran GIS S/s alongwith GIS Duct (at 400kV and 220kV) in new diameter of ICT-Tie-Line on LSTK basis

LOA:- PTCL/CON/2023-24/220 dated:- 08.08.2023

TITLE: OVERALL EARTHING LAYOUT EXTENSION AT PATRAN SCALE: NTS

DRAWING NUMBER: PTCL/STS/PATRAN/CIV/DRG/38 PROJECTION

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
R0	30-11-2023	FIRST SUBMISSION OF DRAWING	B.A.	B.A.	S.T.

REV- 00 SIZE- A2 SHEET: 03 OF 03
 COMMENTED APPROVED APPROVED WITH NOTINGS RELEASED TO SITE