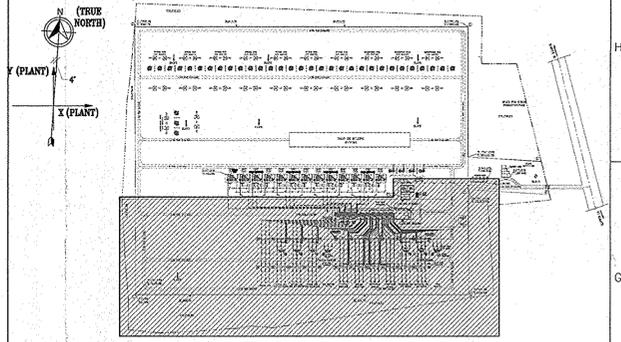


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- LEGEND:-**
- 40mm  $\phi$  MS ROD FOR MAIN EARTH MAT
  - 40mm  $\phi$  MS ROD (BELOW GROUND RISER)
  - 506mm MS FLAT (FOR OUTDOOR CABLE TRENCH)
  - 40mm  $\phi$ , 3M LONG GS PIPE EARTH ELECTRODE WITH TREATED EARTH PIT
  - 40mm  $\phi$ , 3M LONG MS ROD ELECTRODE
  - STONE SPREADING AREA INSIDE SWITCHYARD (A.B.C.D.E.A.F)

- PGCIL REFERENCE DRAWINGS:-**
- STANDARD EARTHING DETAILS, DRAWING No: C/ENG/SPEC/SE REV. No: 08
  - KUDGI (GIS) MAIN EARTH MAT SPACING, LETTER: C-ENG--SR--785KV KUDGI(NEW) GIS-58 Dt: 02.01.2015
- L&T REFERENCE DRAWINGS:-**
- 785/400KV KUDGI GIS SUBSTATION - OVERALL EQUIPMENT LAYOUT PLAN & SECTION, DWG No: 014055-E-IS-SY-EL-0001
  - 785/400KV KUDGI GIS SUBSTATION - 400KV GIS BUILDING EARTHING & LIGHTNING PROTECTION LAYOUT, DWG No: 014055-E-IS-SY-GB-GL-4015
  - 785/400KV KUDGI GIS SUBSTATION - CONTROL BUILDING EARTHING & LIGHTNING PROTECTION LAYOUT, DWG No: 014055-E-IS-SY-CP-1017
  - 785/400KV KUDGI GIS SUBSTATION - OUTDOOR CABLE TRENCH LAYOUT, DRAWING No: 014055-E-IS-SY-CL-1015
  - 785/400KV KUDGI GIS SUBSTATION - FIRE FIGHTING PUMP HOUSE CABLE TRENCH, EARTHING & LIGHTNING PROTECTION LAYOUT DRAWING No: 013119-E-IS-SY-GL-1018

- NOTES:-**
- ALL DIMENSIONS ARE IN MM. LEVELS ARE IN METERS, UNLESS OTHERWISE SPECIFIED.
  - EARTH MAT AND EARTH PIT LOCATION SHOWN ARE INDICATIVE ONLY. MINOR MODIFICATION IF ANY MAY BE CARRIED OUT AT SITE WITHOUT EXCEEDING THE MAXIMUM SPAN INDICATED IN THE DRAWING (20m)
  - MAIN GRID CONDUCTOR SHALL BE LAID AT 600mm BELOW INDICATED FSL
  - EARTHING CONNECTIONS TO EQUIPMENT TERMINALS SHALL BE OF BOLTED TYPE.
  - CONNECTION OF EQUIPMENT ARE INDICATIVE ONLY. EXACT LOCATION OF CONNECTIONS SHALL BE ALONG ALL THE LINES UP TO RIGHT END UNLESS OTHERWISE SPECIFIED AT SITE AS PER EQUIPMENT MANUFACTURER'S EARTHING ARRANGEMENT
  - TAP CONNECTION FROM EARTH GRID TO THE EQUIPMENT/STRUCTURE SHALL BE TERMINATED ON THE EARTHING TERMINALS OF THE EQUIPMENT/STRUCTURE AS PER THE "PGCIL STANDARD EARTHING DETAILS" OF SECTION-SWITCHYARD SECTION REV. 07 OF TECHNICAL SPECIFICATION.
  - WHEREVER EARTHING GRID INFRINGES WITH FOUNDATION, GRID CONDUCTOR SHALL BE INVERTED SUITABLY AT SITE
  - ALL UNDERGROUND CONNECTIONS SHALL BE MADE BY ELECTRIC ARC WELDING. THE WELDING JOINT SHALL BE ALLOWED TO COOL NATURALLY.
  - ALL THE WELD JOINTS SHALL BE TREATED WITH RED LEAD AND AFTERWARDS COATED WITH TWO COATS OF BITUMEN COMPOUND.
  - CABLE SUPPORTS IN TRENCHES SHALL BE EARTHED BY 40mm MS FLAT
  - WHEREVER EARTHING CONDUCTOR INFRINGES CABLE TRENCH, THE SAME SHALL BE LAID AT 300mm BELOW CABLE TRENCH
  - THE EARTH FLAT ALONG THE CABLE TRENCH SHALL BE EARTHED AT THE ENDS OF THE TRENCH AND SPACE BETWEEN EVERY 300(MAX) INTERNAL. THE FLAT SHALL BE FINALLY PAINTED WITH TWO COATS OF RED OXIDE PRIMER AND TWO COATS OF POST OFFICE RED ENAMEL PAINT.
  - EARTHING CONDUCTOR CROSSING ROAD SHALL BE LAID AT 300MM BELOW ROAD
  - EVERY ALTERNATE POST OF FENCE SHALL BE CONNECTED THROUGH THE MAIN EARTH MAT AND SPACE BETWEEN EVERY 300(MAX) INTERNAL
  - ALL THE EQUIPMENTS STRUCTURE, TOWER STRUCTURE, METALLIC STAIRS SHALL BE CONNECTED THROUGH THE NEAREST EARTHING GRID BY AT LEAST TWO EARTHING LEADS
  - FOR EASY DRAINAGE OF WATER, THE SLOPE OF 1:1000 IS TO BE PROVIDED FROM THE RIDGE TO THE NEAREST DRAIN. THE RIDGE SHALL BE SUITABLY LOCATED AT THE CENTRE OF THE AREA BETWEEN THE NEAREST DRAINS. THE ABOVE SLOPE SHALL BE PROVIDED AT THE TOP OF BASE LAYER OF C.C IN 1:5:10 (1 CEMENT : 5 FINE SAND : 10 BURNT BRICK AGGREGATE/40mm GRAVEL)
  - GRAVEL SPREADING AND PGCL MAT SHALL BE PROVIDED FOR THE SWITCHYARD AREA UNDER ABCDEAF MARKED IN THE LAYOUT.

**BILL OF QUANTITY FOR EARTHING:**

SYMBOL	DESCRIPTION	UNIT	KUDGI (NEW) QTY	KUDGI (EXTN) QTY
ELA	ROD EARTH ELECTRODE FOR LIGHTNING ARRESTOR 40mm $\phi$ , 3M LONG MS ROD ELECTRODE (AS PER PGCL STANDARD DWG SHEET: 1446)	No.	15	24
ECVT	ROD EARTH ELECTRODE FOR CAPACITOR VOLTAGE TRAF. (AS PER PGCL STANDARD DWG SHEET: 1366)	No.	12	18
ELM	ROD EARTH ELECTRODE FOR LM 40mm $\phi$ , 3M LONG MS ROD ELECTRODE (AS PER PGCL STANDARD DWG SHEET: 1866)	No.	04	-
ELTP	ROD EARTH ELECTRODE FOR TOWER WITH PEAK 40mm $\phi$ , 3M LONG MS ROD ELECTRODE (AS PER PGCL STANDARD DWG SHEET: 1966)	No.	02	02
EN	40mm $\phi$ , 3M LONG GS PIPE EARTH ELECTRODE WITH TREATED EARTH PIT FOR LT TRAF. & BUS REACTOR (AS PER PGCL STANDARD DWG SHEET: 25,26,7,8&5)	No.	08	04
ESC	ROD EARTH ELECTRODE FOR SWITCHYARD CORNERS 40mm $\phi$ , 3M LONG MS ROD ELECTRODE (AS PER PGCL STANDARD DWG SHEET: 6)	No.	06	-
	40mm $\phi$ MS ROD FOR MAIN EARTH MAT SWITCHYARD AREA	M	6650	6650
	40mm $\phi$ MS ROD (BELOW GROUND RISER)	M	1600	1400
	75x12mm GS FLAT (ABOVE GROUND RISER)	M	1200	600
	506mm GS FLAT FOR JB / MS	M	120	80
	506mm MS FLAT (FOR OUTDOOR CABLE TRENCH)	M	-	-
	CLEAT TYPE CLAMP TO SUIT 75x12mm GS FLAT	No.	530	450

**ISSUED FOR APPROVAL**

DESIGNED: [Signature] DRAWN: [Signature] CHECKED: [Signature] APPROVED: [Signature]

**REVISIONS**

REV. NO.	DESCRIPTION	DESIGNED	DRAWN	CHECKED	APPROVED
A	ISSUED FOR APPROVAL	[Signature]	[Signature]	[Signature]	[Signature]

**HYOSUNG CORPORATION**

**L&T Construction**  
Power Transmission & Distribution

CLIENT: POWER GRID CORPORATION OF INDIA LIMITED (A GOVERNMENT OF INDIA ENTERPRISE)

CONSULTANT:

PROJECT: SUBSTATION PACKAGE S1 FOR (A) 01 400KV NARENDRA (KUDGI) (GIS) NEW SUBSTATION INCLUDING 1x125MVAR 430KV BUS REACTOR & EXTENSION OF 400KV NARENDRA (EXISTING) SUBSTATION UNDER ITS ASSOCIATED WITH SRSS-XVII. (B) EXTENSION OF 400KV NARENDRA (KUDGI) GIS NEW SUBSTATION UNDER KUDGI TDS OF NTPC LTD.  
LDA Ref No: CS-C5/445-312/GIS-2151/3/05/NOA-1/4887, Dated: 05.03.2014

**SUPPLIER/CONTRACTOR:**

JOB No.: 014055-E-IS

DRSN	CHKD	DATE
DRSN	ADA	02.01.15
CHKD	SKW	03.01.15
APPD	SKW	05.01.15
APPD	SKW	05.01.15

TITLE: 400KV KUDGI GIS SUBSTATION OVERALL EARTHING LAYOUT

SCALE: 1:1000

PROJECTION: [Symbol]

DRG. No. 014055-E-IS-SY-GL-1021

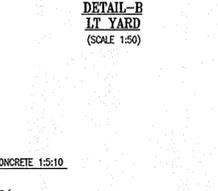
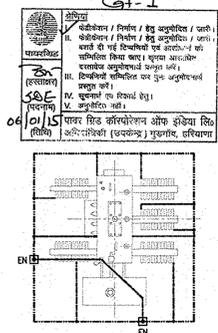
SHEET 01 OF 01

RELEASED FOR:  PRELIMINARY  TENDER  INFORMATION  APPROVAL  CONSTRUCTION

*(\*) -> Final quantity shall be as per actual measurement at site.*

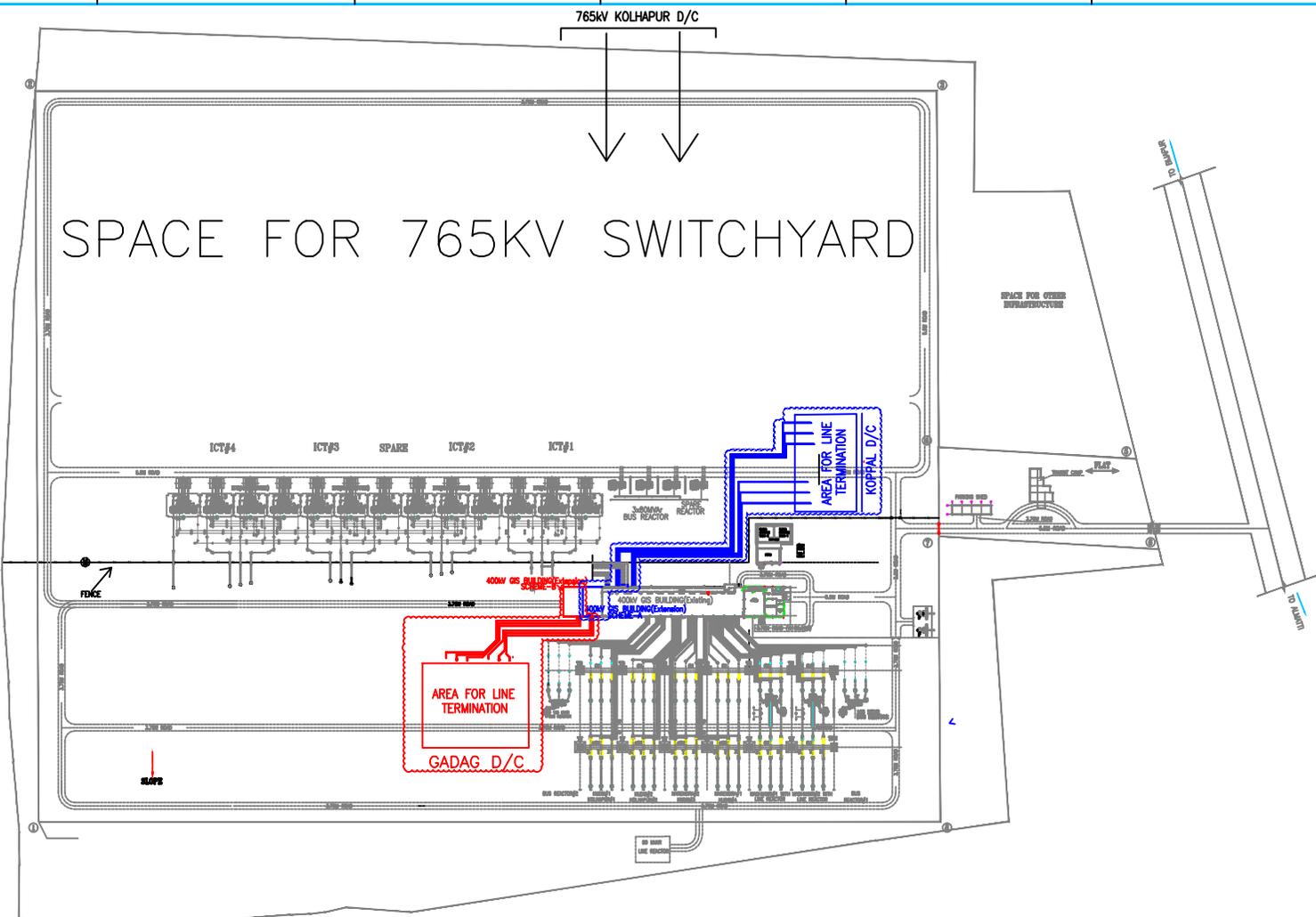
*(\*) -> Quantity is for reference only. Any additional quantity required under LS item shall be supplied and erected by M/s L&T without any additional cost implication to POWERGRID.*

*Please submit separate drawing for stone spreading layout alongwith BOB.*



C:\Users\laxmi\Documents\Projects\400KV NARENDRA (KUDGI) GIS SUBSTATION PACKAGE S1 FOR (A) 01 400KV NARENDRA (KUDGI) GIS NEW SUBSTATION INCLUDING 1x125MVAR 430KV BUS REACTOR & EXTENSION OF 400KV NARENDRA (EXISTING) SUBSTATION UNDER ITS ASSOCIATED WITH SRSS-XVII. (B) EXTENSION OF 400KV NARENDRA (KUDGI) GIS NEW SUBSTATION UNDER KUDGI TDS OF NTPC LTD. (LDA Ref No: CS-C5/445-312/GIS-2151/3/05/NOA-1/4887, Dated: 05.03.2014)

# SPACE FOR 765KV SWITCHYARD



NOTES:-

### SCHEME A (KOPPAL)

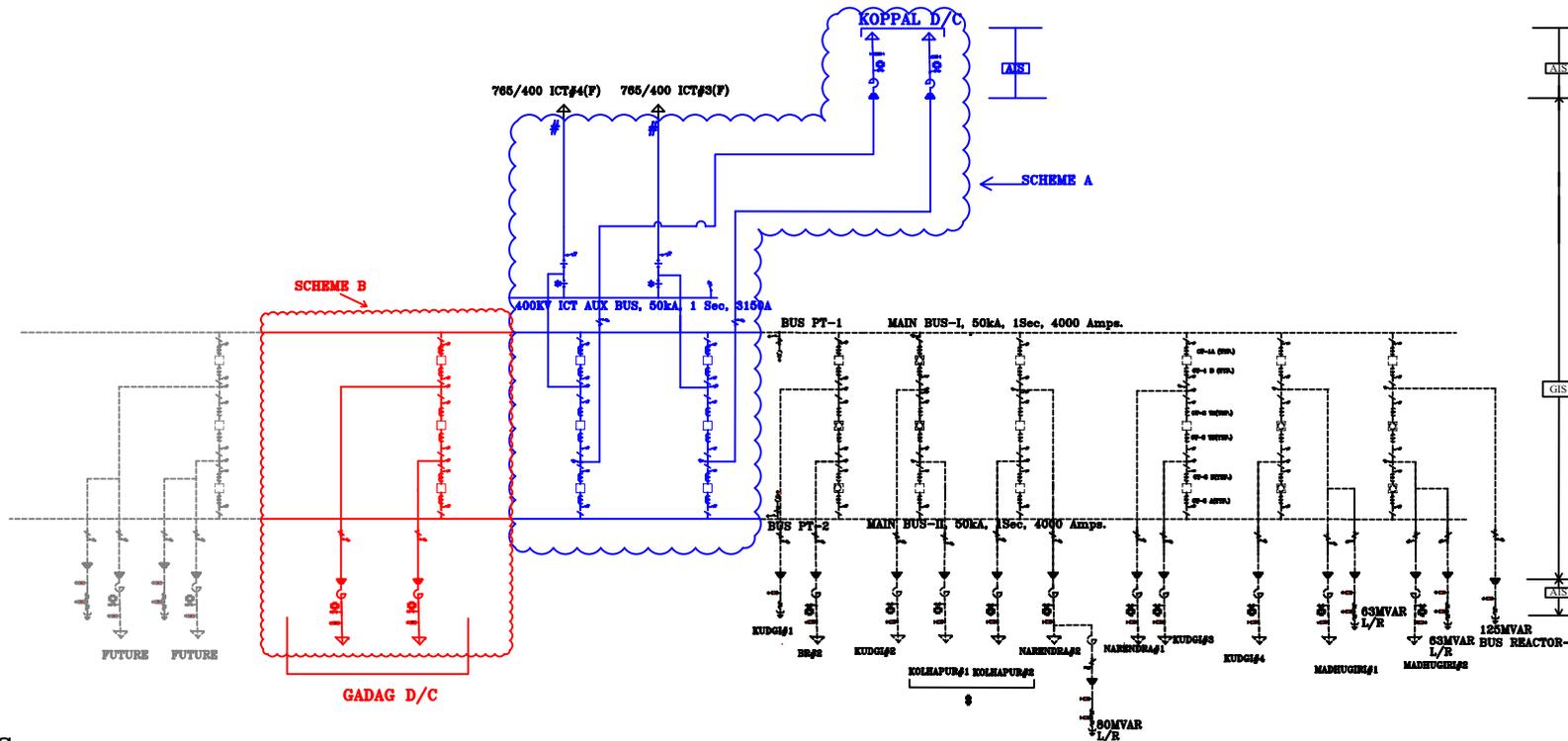
1. # SUBSEQUENT TO UPGRADATION OF NARENDRA(NEW)- KOLHAPUR 400 kv D/C LINES TO 765 kv VOLTAGE LEVEL, ASSOCIATED 400 kv BAYS SHALL BE UTILIZED FOR CONNECTION OF 765/400 kv ICT#1&2 SUITABLY.
2. 400kv GIS BUS DUCTS UNDER PRESENT SCOPE (INCLUDING DUCT FOR AUXILIARY BUS) SHALL BE BROUGHT OUTSIDE THE GIS HALL AND SHALL BE PROVIDED WITH EXTENSION MODULES SUITABLY FOR FUTURE CONNECTION UPTO 765/400 kv ICT#3&4.
3. DESTINATION OF FEEDERS MARKED AS EXISTING/FUTURE ARE INDICATIVE ONLY.
4. GIS BUILDING SHALL BE EXTENDED SUITABLY KEEPING THE SPACE FOR MAINTENANCE BAY AS ALREADY AVAILABLE.
5. THIS GA DRAWING SHALL BE READ IN CONJUNCTION WITH SLD & RFP DOCUMENT

### SCHEME B (GADAG)

1. AS A SPECIAL CASE, BOTH THE CIRCUITS OF GADAG PS- NARENDRA(NEW) GIS 400 kv D/C LINE ARE CONSIDERED TO BE TERMINATED IN THE SAME DIAMETER (TO BE CONSTRUCTED UNDER PRESENT SCOPE).
2. EXISTING 400kv MAIN BUS-I & II (GIS) SHALL BE EXTENDED TO NEW GIS HALL BEING CONSTRUCTED UNDER PRESENT SCOPE.
3. DESTINATION OF FEEDERS MARKED AS EXISTING/FUTURE ARE INDICATIVE ONLY.
4. GIS BUILDING SHALL BE EXTENDED SUITABLY KEEPING THE SPACE FOR MAINTENANCE BAY AS ALREADY AVAILABLE.
5. 400KV GIS BAYS FOR TERMINATION OF LINES UNDER GADAG SCHEME ARE CONSIDERED ADJACENT TO GIS LINE BAYS OF KOPPAL SCHEME. THIS IMPLIES THAT GADAG LINE BAYS CAN BE CONSTRUCTED ONLY AFTER CONSTRUCTION/ COMMISSIONING OF KOPPAL LINE BAYS AT NARENDRA (NEW) GIS S/S.
6. THIS GA DRAWING SHALL BE READ IN CONJUNCTION WITH SLD & RFP DOCUMENT.

	PRESENT SCOPE UNDER SCHEME A (KOPPAL)
	PRESENT SCOPE UNDER SCHEME B (GADAG)
	FUTURE/EXISTING

<b>POWER GRID CORPORATION OF INDIA LIMITED</b> <small>(A GOVERNMENT OF INDIA ENTERPRISE)</small>		
<b>PROJECT:</b> TRANSMISSION SYSTEM FOR KOPPAL WIND ENERGY ZONE [SCHEME A] TRANSMISSION SCHEME FOR EVACUATION OF 1000 MW FROM GADAG SEZ UNDER PHASE-I [SCHEME B]		
<b>SUBSTATION:</b> 765/400KV NARENDRA NEW (KUDGI) GIS S/S EXTN.		
<b>TITLE:</b> GENERAL ARRANGEMENT		
<b>DTD</b> 03/06/2021	<b>DRG.NO.</b> C/ENGG/TBCB/NARENDRA/GA/02	<b>REV</b> 2



400KV GIS EQUIPMENTS SYMBOLS	
1	CIRCUIT BREAKER
2	ISOLATOR
3	EARTH SWITCH
4	SF6/AIR Bushing
5	CURRENT TRANSFORMER

400kV(AIS)EQPT. SYMBOLS	
1	SURGE ARRESTER
2	CAPACITOR VOLTAGE TRANSFORMER
3	WAVE TRAP

LEGEND:

- PRESENT SCOPE UNDER SCHEME A (KOPPAL)
- PRESENT SCOPE UNDER SCHEME B (GADAG)
- FUTURE/EXISTING

**NOTES**

- [SCHEME A- KOPPAL]**
1. \$ SUBSEQUENT TO UPGRADATION OF NARENDRA(NEW)-KOLHAPUR 400 kV D/C LINES TO 765 kV VOLTAGE LEVEL, ASSOCIATED 400 kV BAYS SHALL BE UTILIZED FOR CONNECTION OF 765/400 kV ICT#1&2 SUITABLY.
  2. # 400KV GIS BUS DUCTS (INCLUDING DUCT FOR AUXILIARY BUS) SHALL BE BROUGHT OUTSIDE THE GIS HALL AND SHALL BE PROVIDED WITH EXTENSION MODULES SUITABLY FOR FUTURE CONNECTION UPTO 765/400 kV ICT#3&4.
  3. THIS SLD DRAWING SHALL BE READ IN CONJUNCTION WITH GA & RFP DOCUMENT.

- [SCHEME B- GADAG]**
1. AS A SPECIAL CASE, BOTH THE CIRCUITS OF GADAG PS- NARENDRA(NEW) GIS 400 kV D/C LINE ARE CONSIDERED TO BE TERMINATED IN THE SAME DIAMETER (TO BE CONSTRUCTED UNDER PRESENT SCOPE).
  2. DESTINATION OF FEEDERS MARKED AS EXISTING/FUTURE ARE INDICATIVE ONLY.
  3. 400KV GIS BAYS FOR TERMINATION OF LINES UNDER GADAG SCHEME ARE CONSIDERED ADJACENT TO GIS LINE BAYS OF KOPPAL SCHEME. THIS IMPLIES THAT GADAG LINE BAYS CAN BE CONSTRUCTED ONLY AFTER CONSTRUCTION/ COMMISSIONING OF KOPPAL LINE BAYS AT NARENDRA (NEW) GIS S/S.
  4. THIS SLD DRAWING SHALL BE READ IN CONJUNCTION WITH GA & RFP DOCUMENT.

**POWER GRID CORPORATION OF INDIA LIMITED**

(A GOVERNMENT OF INDIA ENTERPRISE)

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**PROJECT:**  
**TRANSMISSION SYSTEM FOR KOPPAL WIND ENERGY ZONE(KARNATAKA) [SCHEME A]**  
**TRANSMISSION SCHEME FOR EVACUATION OF 1000 MW FROM GADAG SEZ UNDER PHASE-I [SCHEME B]**

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**SUBSTATION:**  
**765/400kV NARENDRA NEW (KUDGI) GIS S/S EXTN.**

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**TITLE:** SINGLE LINE DIAGRAM

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<b>DTD</b>	<b>DRG.NO.</b>	<b>REV.</b>
03/06/2021	C/ENGG/TBCB/NARENDRA(NEW)/SLD	1