



COVER
















1

DESIGNATION OF	TITLE	REVISION			
1	COVERING SHEET	0			
2	LIST OF DRAWINGS	0			
3	LEGEND & NOTE	0			
4	UPS SINGLE LINE DIAGRAM	0			

LIST OF DRAWINGS

REFERENCE DRAWINGS	
DRAWING NO.	TITLE
<input type="checkbox"/> APPROVED <input type="checkbox"/> APPROVED WITH COMMENTS <input type="checkbox"/> NOT APPROVED <input type="checkbox"/> FOR INFORMATION DATE: _____ SIGNATURE/STAMP: _____ PROJECT CONSULTANT	
 KENYA ELECTRICITY TRANSMISSION COMPANY LTD	
 COLENGO CONSULTING LIMITED	
PROJECT: KENYA TRANSMISSION NETWORK IMPROVEMENT PROJECT (KTRNIP).	
PROJECT DRAWING NO.	PROJECT FILE
NAME:	DATE:
PREPARED: NB	KABARNET132/33KV SUBSTATION
DRAWN: FJ	09/05/2022
CHECKED: V. JOSHI	09/05/2022
APPROVED: S. DESHMUKH	09/05/2022
LIST OF DRAWINGS	
REVISED	
NO	NAME DATE
SCALE: 1:400	DWG NO
	REV:



LEGEND

	FUSE SWITCH		VOLTMETER		VOLTAGE SELECTOR SWITCH		SIGNAL LAMP
	MINIATURE CIRCUIT BREAKER		AMMETER		EARTH FAULT RELAY		EARTH
	CURRENT TRANSDUCER		WATT METER		INSTANTANEOUS AND INVERSE EARTH FAULT RELAY		CONTACT
	VOLTAGE TRANSDUCER		CURRENT TRANSFORMER		UNDER/OVER VOLTAGE		

NOTES:

- 1-NUMBERS AND RATINGS SHALL BE SPECIFIED AT DETAIL DESIGN STAGE BY EPC CONTRACTOR BASED ON CALCULATIONS SUBJECT TO CLIENT/CONSULTANT APPROVAL.
- 2-AT LEAST 20 PERCENT OF EACH FEEDERS SIZE SHALL BE CONSIDERED AS SPARE FEEDER IN ADDITION TO FUTURES.
- 3-SHORT CIRCUIT CAPACITY OF BUSBAR ARE THE MIN-VALUE, AND SHALL BE FINALIZED AT DETAIL DESIGN STAGE BY EPC CONTRACTOR BASED ON CALCULATIONS SUBJECT TO CLIENT/CONSULTANT APPROVAL.
- 4-ALL MEASURING VALUES(VOLTAGE, CURRENT, REACTIVE POWER, ACTIVE POWER, FREQUENCY, POWER FACTOR, ENERGY, TEMPERATURE AND ETC) SHALL BE MONITORED THROUGH HMI AND ALL NECESSARY EQUIPMENT SUCH AS TRANSDUCERS SHALL BE CONSIDERED.
- 5-ALL OF INVERTER INFORMATION SHOULD BE SENT TO HMI.
- 6-THE CAPABILITY OF PARALLELING SHOULD BE SUPPLIED FOR 2 INVERTERS.
- 7-ALL MCCBs/MCBs FOR FUTURE EXTENSION SHALL BE SUPPLIED.
- 8-OPERATION OF ALL RELAYS SHALL BE SHOWN IN HMI.
- 9-ALL MCCBs AND MCBs SHALL BE EQUIPPED WITH AUXILIARY CONTACT.
- 10-SIZE OFF ALL CABLES SHALL BE DETERMINED AT DETAIL DESIGN STAGE BY EPC CONTRACTOR BASED ON CALCULATIONS SUBJECT TO CLIENT/CONSULTANT APPROVAL.
- 11-SINGLE LINE DIAGRAM OF INVERTER SHALL BE SHOWN IN HMI WITH DYNAMIC COLORS.
- 12-AUTOMATIC CHANGE OVER OPERATION (A.C.O) SHOULD BE DONE BELOW 4ms AND SUPPLIED BY INVERTER MANUFACTURER.(STATIC SW.)
- 13-THE RANGE OF INVERTER SHALL BE SIZED (MINIMUM 6000 VA FOR A 10HR AUTONOMY PERIOD) CONSISTING OF DUAL INDEPENDENTLY OPERATION UNITS COMPLETE WITH ALL ACCESSORIES. THE CONTRACTOR SHALL PROVIDE SIZING CALCULATIONS FOR THE UPS LOADING AT DETAIL DESIGN STAGE SUBJECT TO CLIENT/CONSULTANT APPROVAL.
- 14-THE UPS SYSTEM SHALL CONSIST OF DUAL INDEPENDENTLY OPERATING UNITS WORKING AS SHARING THE LOAD METHOD WITH ALL NECESSARY CONTROL, STATIC SWITCHES, MANUAL BYPASS SWITCH, ETC. NECESSARY FOR THE RELIABLE OPERATION OF UPS SYSTEM UNDER ALL OPERATING CONDITIONS OF THE SUBSTATION.
- 15-SUITABLE FILTERS & STABILIZERS SHALL BE USED TO OBTAIN A PURE SINUSOIDAL WAVE OUTPUT.
- 16-ALL SIGNALS REQUIRED TO CONTROL THE UPS SYSTEM SHOULD BE CONSIDERED/MONITORED IN SAS.
- 17-IN NORMAL CONDITION THE UPS SHALL BE FED BY MAIN DC BOARD(OFF-LINE MODE OPERATION)
- 18-INVERTER SWITCHING SHALL BE DONE IN AUTO & MAN MODE IN SYNCHRONIZING CONDITION.
- 19-THE CONTRACTOR SHALL PROVIDE SUB-DISTRIBUTION BOARDS AS REQUIRED SUBJECT TO CLIENT/CONSULTANT APPROVAL.
- 20-INVERTER OUTPUT EARTHING SYSTEM SHOULD BE "IT" TYPE & AN INSULATION MONITORING RELAY SHOULD BE USED AS THE RELAY OF ANSI CODE 64.
- 21-LIGHTNING ARRESTOR SHALL BE CONSIDERED.
- 22-MANUAL BY PASS SWITCH SHALL BE MAKE BEFORE BREAK.
- 23-THE UPS SHALL BE SUITABLE FOR CONTINUOUS OPERATION, AND FUNCTION SATISFACTORILY WITH A COMBINATION OF VARIATIONS OF THE INCOMING SUPPLY VOLTAGE OF 10% OF NOMINAL AND FREQUENCY OF 5% OF NOMINAL.
- 24-THE UPS SYSTEM SHALL BE FED FROM 110V DC/415V AC SWITCHBOARDS BY TWO SUITABLE RATED MCCB CONNECTED TO THE SEPARATE BUS SECTIONS.
- 25-MULTIPLICATION RELAYS WITH THREE CONTACTS FOR EACH ALARM OF THE UPS SYSTEM TO BE PROVIDED.
- 26-THE CUBICLES SHALL BE COMPLETELY SELF-SUPPORTING, MADE OF A REQUIRED NUMBER OF STANDARDIZED, PREFABRICATED, VERTICAL SECTIONS BOLTED TOGETHER TO FORM INDOOR METAL CLAD, DUST-PROOF RIGID UNIT, DEGREE OF PROTECTION IP51. THE CUBICLES SHALL BE FREE STANDING, EQUIPPED WITH BOTTOM FRAMES SUITABLE FOR BOLTING TO THE FLOOR. SHEET STEEL THICKNESS SHALL NOT BE LESS THAN 2 mm.

LEGEND & NOTE

REFERENCE DRAWINGS			
DATE:	REV:		
<input type="checkbox"/>	APPROVED	<input type="checkbox"/>	APPROVED WITH COMMENTS
<input type="checkbox"/>	NOT APPROVED	<input type="checkbox"/>	FOR INFORMATION
DATE:	SIGNATURE/STAMP: "PROJECT CONSULTANT"		
 KENYA ELECTRICITY TRANSMISSION COMPANY LTD.			
 COLONCO CONSULTING LIMITED			
PROJECT:			
KENYA TRANSMISSION NETWORK IMPROVEMENT PROJECT (KTRNIP).			
PROJECT DRAWING NO.			
NAME:	DATE:	PROJECT NO.	
PREPARED: NK		KABARETTI 32/33KV SUBSTATION	
DRAWING: F-1	29/05/2025	TITLE	
CHECKED: V.JOSH	29/05/2025	UPS SINGLE LINE DIAGRAM	
APPROVED: S.DENMUH	29/05/2025	LEGEND & NOTE	
REVISIONS			
REV NAME DATE			
SCALE: 1:800	DWG NO:	REV:	

