



COVER

1

2	TIME DELAY RELAY	87B	BUSBAR DIFFERENTIAL PROTECTION
21/ 21N	DISTANCE RELAY WITH THREE ZONES	87L	LINE DIFFERENTIAL PROTECTION
24	OVER FLUX RELAY	87NT	RESTRICTED EARTH FAULT PROTECTION RELAY FOR TRANSFORMER
25	SYNCHRO-CHECK RELAY	87NR	RESTRICTED EARTH FAULT PROTECTION RELAY FOR REACTOR
27	UNDER(ZERO) VOLTAGE RELAY	87NTV	RESTRICTED EARTH FAULT PROTECTION RELAY FOR EARTHING TRANSFORMER
46BC	UNBALANCY PROTECTION / BROKEN CONDUCTOR	87T	TRANS. DIFFERENTIAL PROT.(BIASED DIFF.)
49	THERMAL OVER LOAD PROTECTION	87R	REACTOR DIFFERENTIAL PROTECTION RELAY
50	INSTANTANEOUS OVER CURRENT RELAY	87HVC	TRANSFORMER HV CIRCUIT DIFFERENTIAL PROTECTION
50BF	CIRCUIT BREAKER FAILURE RELAY(WITH 2-STAGE)	87LVC	TRANSFORMER LV CIRCUIT DIFFERENTIAL PROTECTION
50NS	INSTANTANEOUS SENSITIVE EARTH FAULT RELAY	94	TRIP RELAY
50/51	INSTANTANEOUS AND INVERSE TIME OVER CURRENT RELAY	94X	AUX. TRIP RELAY WITH HIGH SPEED CONTACT
50N/ 51N	INSTANTANEOUS AND INVERSE EARTH FAULT RELAY	94Y	AUX. TRIP RELAY WITH FLAG
51	INVERSE TIME OVER CURRENT RELAY	95CT	CT SUPERVISION
59	OVER VOLTAGE RELAY	95VT	VOLTAGE SUPERVISION
67	DIRECTIONAL OVER CURRENT RELAY WITH INVERSE TIME CHARACTERISTIC	97	FUSE FAILURE (IN DISTANCE RELAY)
67N	DIRECTIONAL EARTH FAULT RELAY	2/ MECH	TRANSFORMER MECHANICAL PROTECTION
79	AUTO RECLOSE RELAY SINGLE SHOT 1&3 PHASE	BCU	BAY CONTROL UNIT
85	CARRIER INTERFACE/REMOTE TRIP	C.R	CLOSE RELAY
86	LOCKOUT RELAY	DTT	DIRECT TRANSFER TRIP

ER	EVENT RECORDER
FR	FAULT RECORDER
F.F.	FUSE FAILURE RELAY
F.L	FAULT LOCATOR
PD	POLE DISCORDANCE
PSB	POWER SWING BLOCKING
50EF	END FAULT / SHORT ZONE PROTECTION
SOTF	SWITCH ON TO FAULT
STUB	STUB PROTECTION
TCS	TRIP CIRCUIT SUPERVISION RELAY
CCS	CLOSE CIRCUIT SUPERVISION RELAY
VSL	VOLTAGE SELECTION LOGIC
SBF	STANDBY EARTH FAULT PROTECTION

 ACTIVE ENERGY METER (BOTH DIRECTIONS)
(MULTI TARRIF, CLASS 0.2)

 REACTIVE ENERGY METER (BOTH DIRECTIONS)
(MULTI TARRIF, CLASS 0.2)

C.U.	CENTRAL UNIT
B.U.	BAY UNIT
BCPU	BAY CONTROL AND PROTECTION UNIT
POW	POINT ON WAVE SWITCH
BCR	BAY CONTROL ROOM

PANELS



<i>+RW</i>	CONTROL AND PROTECTION PANEL
<i>+W</i>	CONTROL PANEL
<i>+SV</i>	MARSHALING CUBICLE
<i>+M</i>	MEASUREMENT PANEL
<i>+BCU</i>	BAY CONTROL UNIT PANEL



FIBER OPTIC CABLE

 MINIATURE CIRCUIT BREAKER

LEGEND

REFERENCE DRAWINGS									
DRAWINGS 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			
 KETRACO Kenya Electricity Transmission Company Limited <small>Transmitting Power - Transforming Lives</small>						KENYA ELECTRICITY TRANSMISSION COMPANY LTD			
 COLENCO <i>Innovation for sustainable future</i>						COLENCO CONSULTING LIMITED			
PROJECT:									
KENYA TRANSMISSION NETWORK IMPROVEMENT PROJECT (KTRNIP).									
PROJECT DRAWING NO.									
		NAME:		DATE:		PROJECT NO:			
PREPARED:		NIL		9/05/2025		RUMURUTI 132/33KV SUBSTATION			
DRAWN:		F.J		9/05/2025		TITLE:			
CHECKED:		V./JOSHI		9/05/2025		PSLD LEGEND			
APPROVED:		S.DESHMUKH		9/05/2025					
REVISIONS									
NO. NAME DATE									
SCALE: 1:600				DWG NO.				REV.:	

(EXISTING) 132/0.11/0.11 kV
CVT: $\sqrt{3} \quad \sqrt{3} \quad \sqrt{3}$
0.2/0.5(3P), 100/100VA

B.B.1 132kV

B.B.2 132kV

*CVT: 132/0.11/0.11 kV
 $\sqrt{3} \quad \sqrt{3} \quad \sqrt{3}$
0.2/3P(0.5)
-/-VA

*CT: 2000-1600-800/1/1A
CLASS X/5P20
-/-VA

*CT: 2000-1600-800/1/1/1A
CLASS X/0.2/5P20
-/-VA

BUS COUPLER

+SV

+RW

94	94	94	86
TCS	TCS	TCS	F.F
PD			

94	94	94	86
TCS	TCS	TCS	CR
CCS	CCS	CCS	F.F

COUPLER PROT.
50BF/50/5150N/51N
50EF/ER/FR



BCU
BCU/25/ER/FR
VSL
FROM B.B. C.VTs

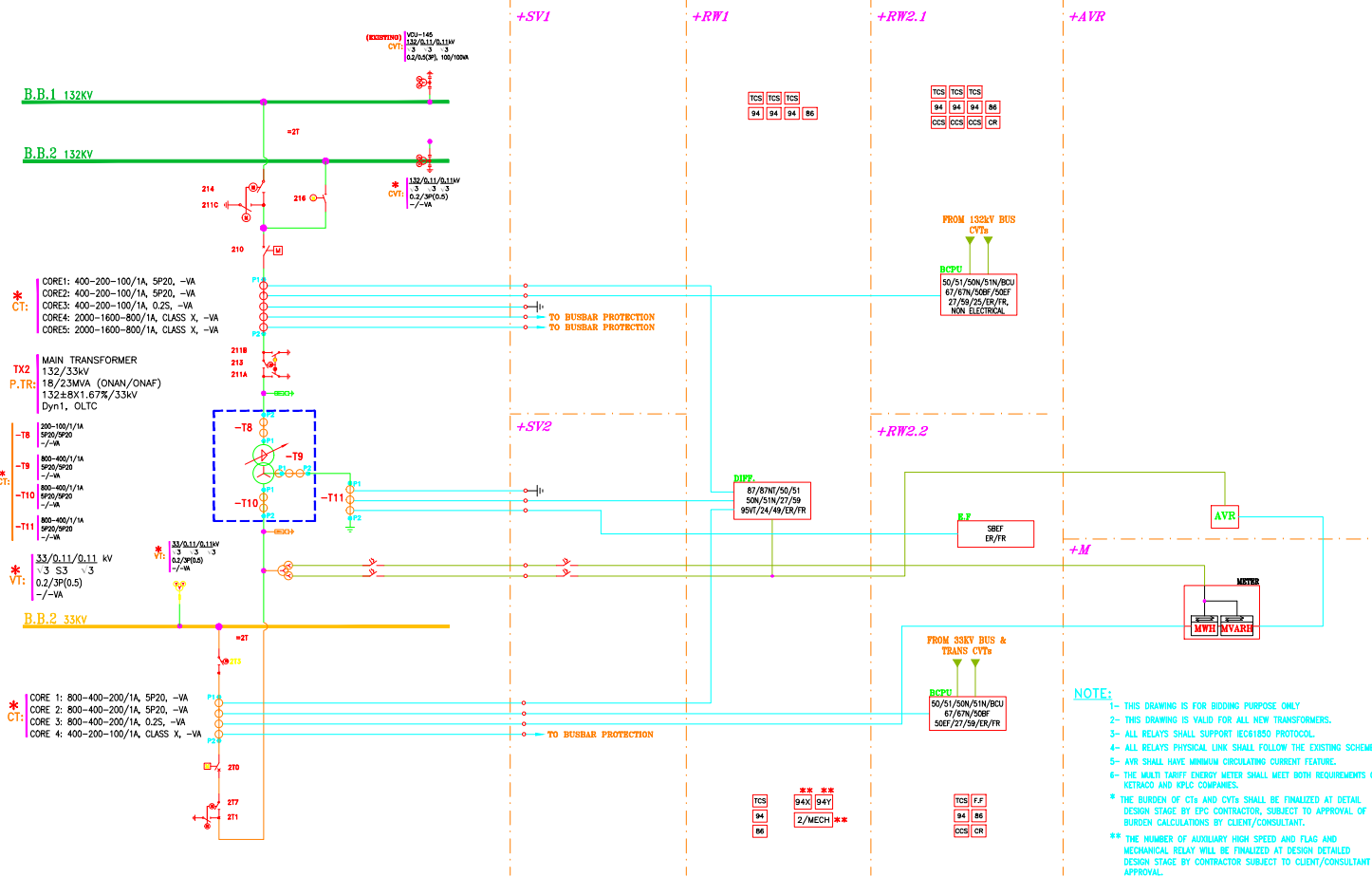
NOTE:

- 1- THIS DRAWING IS FOR BIDDING PURPOSE ONLY
 - 2- ALL RELAYS SHALL SUPPORT IEC-61850 PROTOCOL.
 - 2- ALL RELAYS PHYSICAL LINK SHALL FOLLOW THE EXISTING SCHEME.
- * THE BURDEN OF CTs AND CVTs SHALL BE FINALIZED AT DETAIL DESIGN STAGE BY EPC CONTRACTOR, SUBJECT TO APPROVAL OF BURDEN CALCULATIONS BY CLIENT/CONSULTANT.

132kV BUS COUPLER PROTECTION SLD

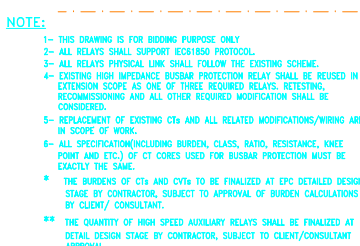
5

REFERENCE DRAWINGS			
REVISED 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	
		COLENCO CONSULTING LIMITED	
PROJECT: KENYA TRANSMISSION NETWORK IMPROVEMENT PROJECT (KTRNP)			
PROJECT DRAWING NO. _____			
PREPARED	NAME: _____	DATE: _____	PROJECT NO. _____
DRAWN	NAME: _____	DATE: _____	
CHECKED	NAME: _____	DATE: _____	
APPROVED	NAME: _____	DATE: _____	
132kV BUS COUPLER PSLD			
TWO NAME DATE			
SCALE: 1:800	DWG NO. RUMURUTI-132KV BC-PSLD-003	REV: 02	



132/33kV TRANSFORMER PROTECTION SLD

REFERENCE DRAWINGS			
NO.	NAME	DATE	PROJECT NO.
1	KETRACO	14/05/2020	RUMURUTI 132/33kV SUBSTATION
2	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
3	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
4	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
5	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
6	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
7	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
8	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
9	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
10	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
11	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
12	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
13	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
14	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
15	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
16	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
17	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
18	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
19	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
20	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
21	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
22	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
23	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
24	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
25	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
26	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
27	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
28	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
29	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
30	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
31	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
32	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
33	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
34	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
35	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
36	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
37	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
38	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
39	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
40	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
41	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
42	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
43	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
44	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
45	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
46	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
47	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
48	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
49	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
50	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
51	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
52	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
53	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
54	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
55	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
56	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
57	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
58	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
59	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
60	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
61	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
62	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
63	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
64	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
65	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
66	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
67	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
68	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
69	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
70	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
71	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
72	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
73	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
74	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
75	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
76	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
77	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
78	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
79	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
80	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
81	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
82	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
83	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
84	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
85	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
86	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
87	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
88	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
89	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
90	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
91	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
92	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
93	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
94	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
95	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
96	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
97	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
98	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
99	KETRACO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD
100	COLONCO	14/05/2020	132/33kV TRANSFORMER PROTECTION SLD

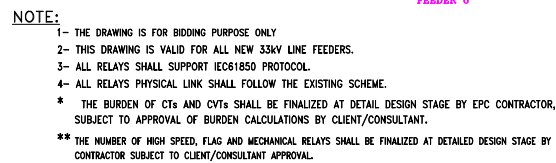
[illegible]





- 1- THIS DRAWING IS FOR BIDDING PURPOSE ONLY
- 2- ALL RELAYS SHALL SUPPORT IEC-61850 PROTOCOL.
- 3- ALL RELAYS PHYSICAL LINK SHALL FOLLOW THE EXISTING SCHEME.

* THE BURDEN OF CTs AND CVTs SHALL BE FINALIZED AT DETAIL DESIGN STAGE BY EPC CONTRACTOR, SUBJECT TO APPROVAL OF BURDEN CALCULATIONS BY CLIENT/CONSULTANT.

REFERENCE DRAWINGS			
REVISION NO.		REV	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
APPROVED	APPROVED WITH COMMENTS	NOT APPROVED	FOR INFORMATION
DATE: _____		SIGNATURE/STAMP: _____ PROJECT COORDINATOR _____	
 KETRACO KENYA ELECTRICITY TRANSMISSION COMPANY LIMITED		KENYA ELECTRICITY TRANSMISSION COMPANY LTD	
 COLECONCO CONSULTANTS FOR ELECTRICAL DESIGN		COLECONCO CONSULTING LIMITED	
PROJECT:			
KENYA TRANSMISSION NETWORK IMPROVEMENT PROJECT (KTRNIP).			
PROJECT DRAWING NO.	NAME	DATE	PROJECT NO.
PREPARED: NL		19/05/2015	RUMURUTI 132/3KV SUBSTATION
DRAWING: F.J			
CHECKED: V.JOSHI		19/05/2015	TITLE
APPROVED: L.SIRIMWAN		19/05/2015	33KV BUS COUPLER PROTECTION SLID
REVISION	NO.	NAME	DATE
SCALE: 1:500		DWG NO.	RM00017H- 33KV BUSCOUPLER-PSLD-601
		REV:	02



10

REFERENCE DRAWINGS			
APPROVED BY:		FILE	
<input type="checkbox"/>	APPROVED	<input type="checkbox"/>	COMMENTS
		<input type="checkbox"/>	NOT APPROVED
		<input type="checkbox"/>	FOR INFORMATION
DATE: _____		SIGNATURE/STAMP _____ PROJECT CODE/SLD _____	
		KENYA ELECTRICITY TRANSMISSION COMPANY LTD	
		COLOCONO CONSULTING LIMITED	
PROJECT:			
KENYA TRANSMISSION NETWORK IMPROVEMENT PROJECT (KTRNIP)			
PROJECT STARTING NO.			
PREPARED:	NAME:	DATE:	PROJECT NO.
DRAWN:	P.J	9/05/2009	RUMURUTI 132/33KV SUBSTATION
CHECKED:	V. KISHA	9/05/2009	FILE
APPROVED:	D. DEDHIAWALI	9/05/2009	33KV LINE PROTECTION SLD
REVISION	TWO NAME DATE		
SCALE:	1:500	DWG NO.	RUMURUTI-33KV LINE-PSLD-003
			REV: 02