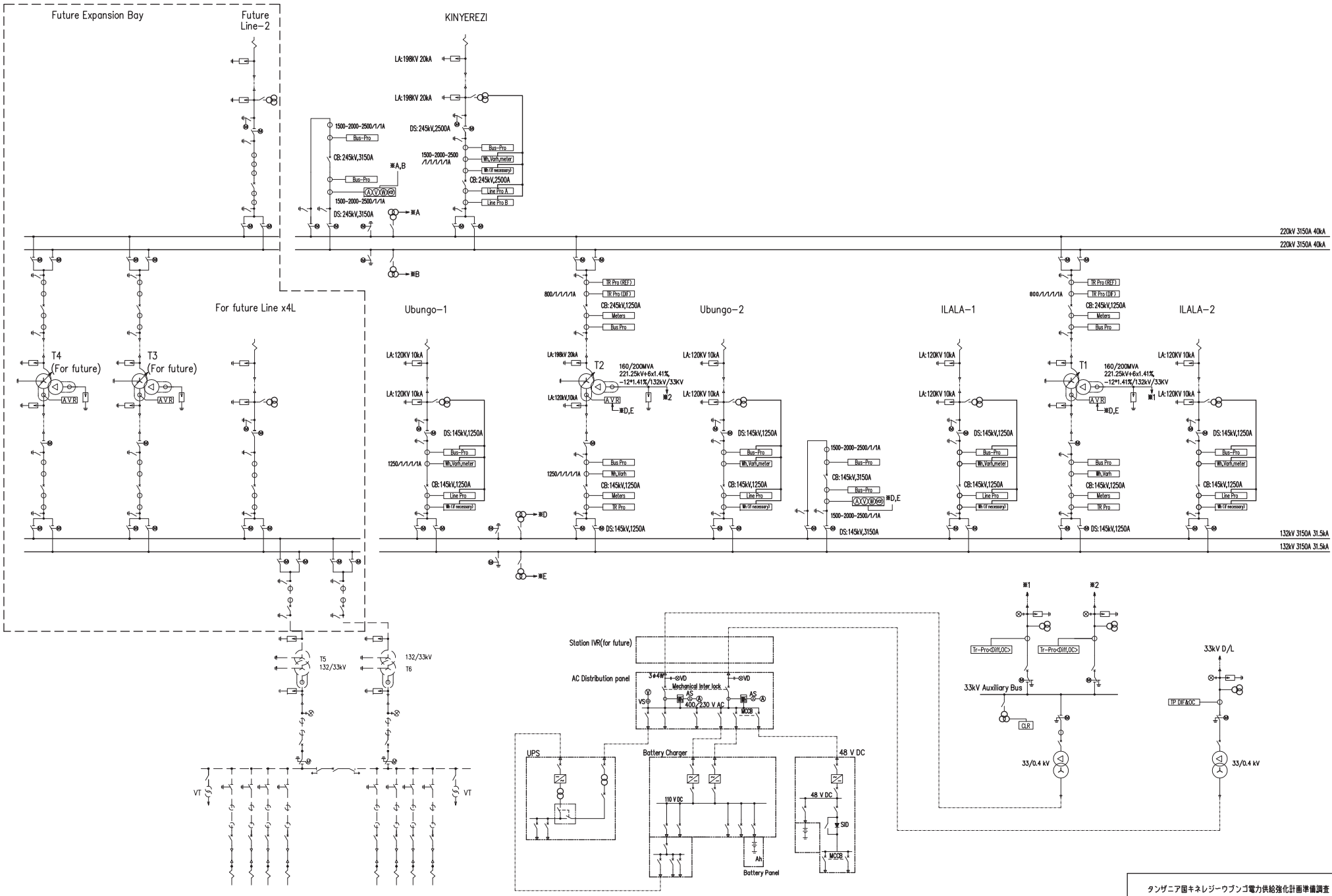
6. 概略設計図

6. 概略設計図

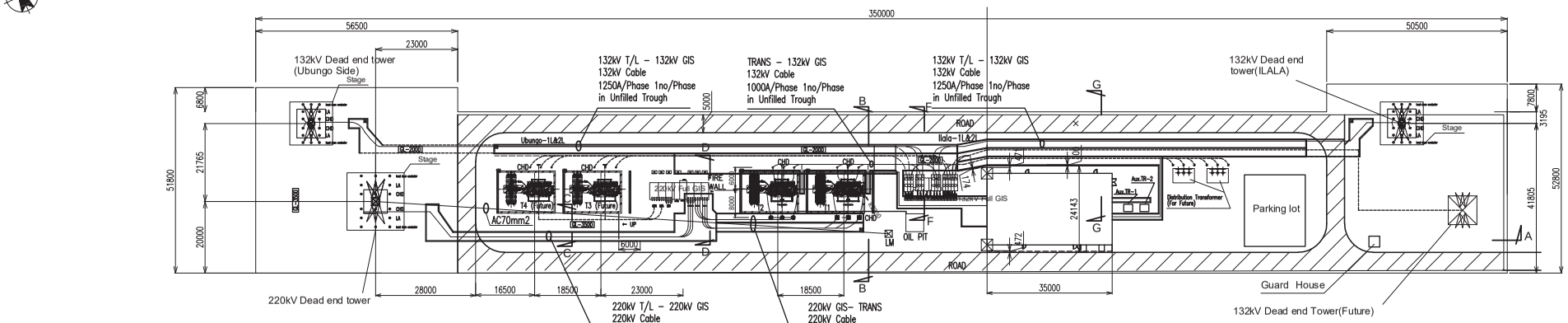
変電設備

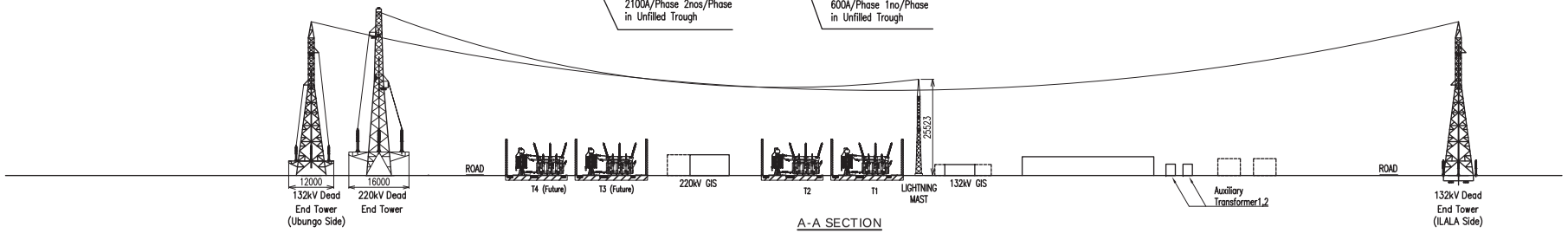
送電設備

変電設備

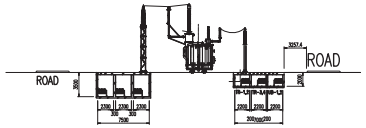


					スケール
タンザニア国キネレジーウブンゴ電力供給強化計画準備調査					NON
Title					図番
単線結線図（マビボ 変電所）					SS-01
日付	作成	審査	承認		改定
August.2021	中村	加村	大橋	2	
西日本技術開発株式会社					

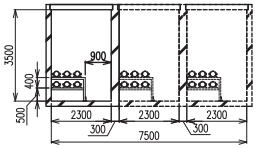




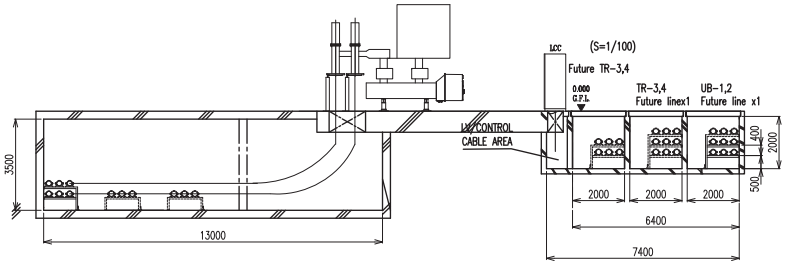
A-A SECTION



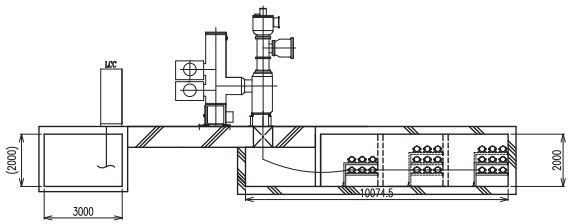
B-B SECTION



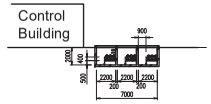
C-C SECTION
(S=1/100)



D-D SECTION
(S=1/100)



F-F SECTION
(S=1/100)

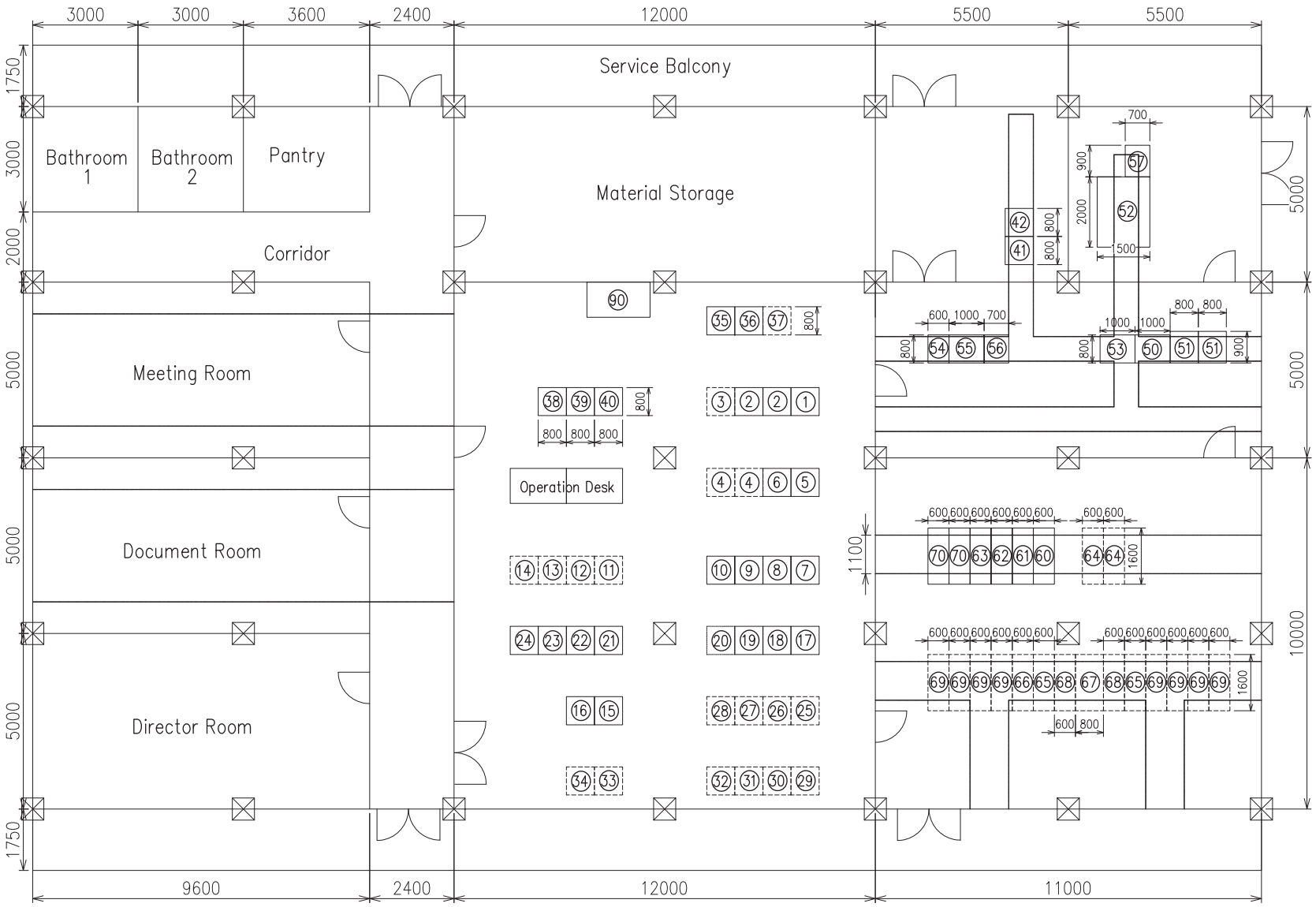


G-G SECTION
(S=1/200)

ELECTRICAL DESIGN CRITERIA			
NOMINAL SYSTEM VOLTAGE (PHASE TO PHASE)	kV(rms)	220	132
RATED VOLTAGE	kV(rms)	245	145
RATED SHORT-DURATION POWER-FREQUENCY WITHSTAND VOLTAGE	kV	460	275
LIGHTNING IMPULSE WITHSTAND VOLTAGE (1.2/50 MICRO SECOND)	kVp	1050	650
MINIMUM CLEARANCE BETWEEN LIVE METAL AND EARTHED OBJECT (IEC 61936-1)	mm	2100	1300
MINIMUM CLEARANCE BETWEEN LIVE METAL PHASE TO PHASE (IEC 61936-1)	mm	2100	1300
MINIMUM CREEPAGE DISTANCE CRITERIA	mm/kV	25	25
PHASE SEQUENCE		R-Y-B = A-B-C = U-V-W	

Preliminary

タンザニア国キネレジーウブンゴ電力供給強化計画準備調査				スケール 1/600, 1/200, 1/100
Title 220/132kV マビボ変電所 一般平面図				図番 SS-02
日付	作成	審査	承認	改定
2021年8月	中村	酒村	大嶋	3
西日本技術開発株式会社				



Control Room

No.	Panel	Note
1	Kinyerezi-1L Control Panel	
2	Kinyerezi-1L Protection Panel	
3	Future Kinyerezi-2L Control Panel	By TANESCO
4	Future Kinyerezi-2L Protection Panel	By TANESCO
5	220kV Bus Coupler Control Panel	
6	220kV Bus protection Panel	
7	T-1 Control Panel	
8	T-1 Protectionl Panel	
9	T-2 Control Panel	
10	T-2 Protectionl Panel	
11	Future T-3 Control Panel	By TANESCO
12	Future T-3 Protectionl Panel	By TANESCO
13	Future T-4 Control Panel	By TANESCO
14	Future T-4 Protectionl Panel	By TANESCO
15	132kV Bus Coupler Control Panel	
16	132kV Bus Protection Panel	
17	ILALA – 1L Control Panel	
18	ILALA – 1L Protectionl Panel	
19	ILALA – 2L Control Panel	
20	ILALA – 2L Protectionl Panel	
21	Ubungo – 1L Control Panel	
22	Ubungo – 1L Protectionl Panel	
23	Ubungo – 2L Control Panel	
24	Ubungo – 2L Protectionl Panel	
25	Future – 1L Control Panel	By TANESCO
26	Future – 1L Protectionl Panel	By TANESCO
27	Future – 2L Control Panel	By TANESCO
28	Future – 2L Protectionl Panel	By TANESCO
29	Future – 3L Control Panel	By TANESCO
30	Future – 3L Protectionl Panel	By TANESCO
31	Future – 4L Control Panel	By TANESCO
32	Future – 4L Protectionl Panel	By TANESCO
33	Future T-5 Control & Protection Panel	By TANESCO
34	Future T-6 Control & Protection Panel	By TANESCO
35	220kV Metering Panel	
36	132kV Metering Panel	
37	Future 33kV Metering Panel	By TANESCO
38	Substation Control Panel-1	
39	Substation Control Panel-2	
40	Substation Control Panel-3	
90	Lighting Panel	

Telecommunication Room

No.	Panel	Note
41	Communication Panel-1	
42	Communication Panel-2	

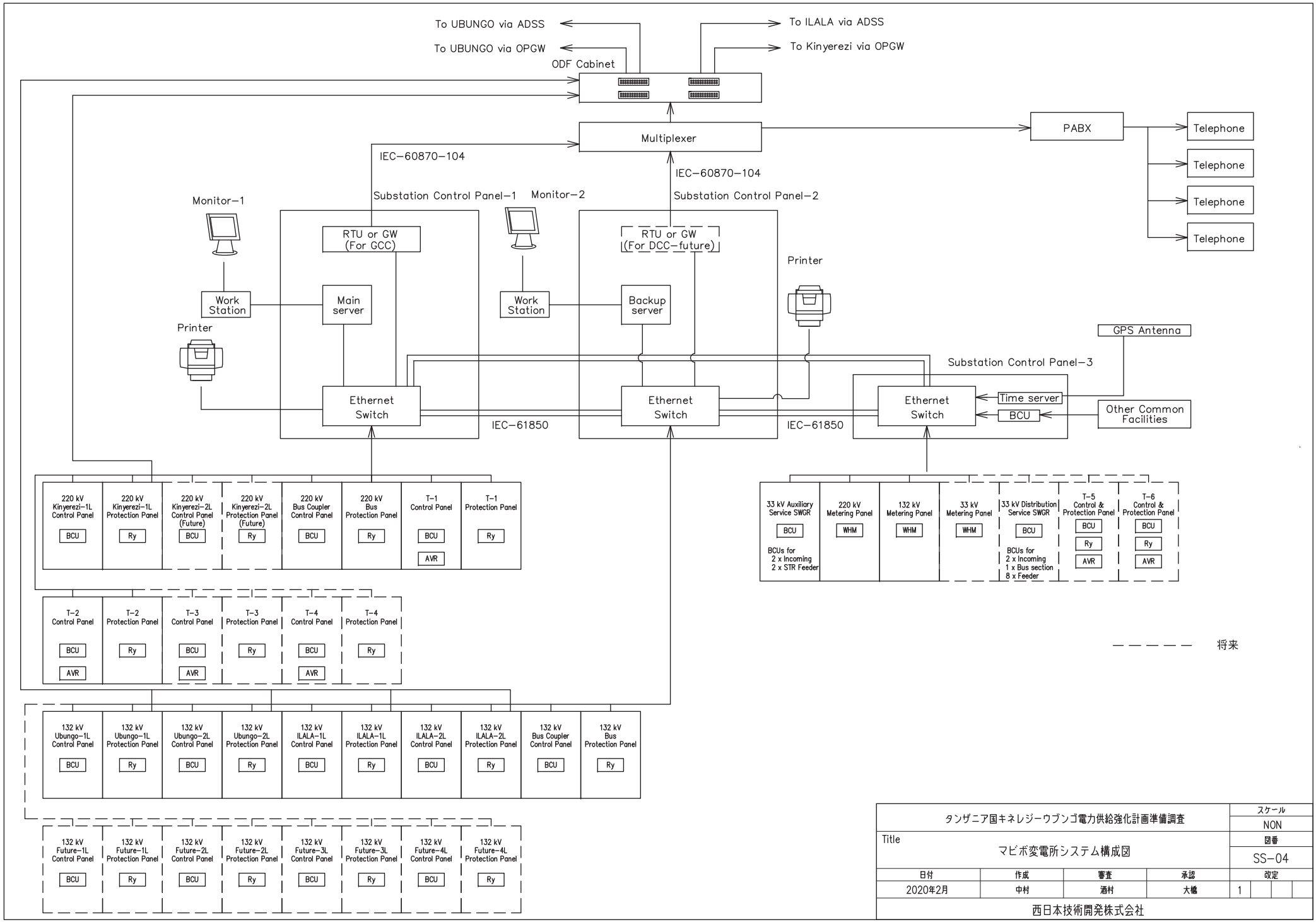
Battery Room

No.	Panel	Note
50	AC Distibution Panel	
51	110V DC Charger Panel	
52	110V DC Battery	
53	DC Distibution Panel	
54	UPS Battery Charger	
55	UPS Inverter	
56	48V DC Charger Panel	
57	48V DC Battery Panel	

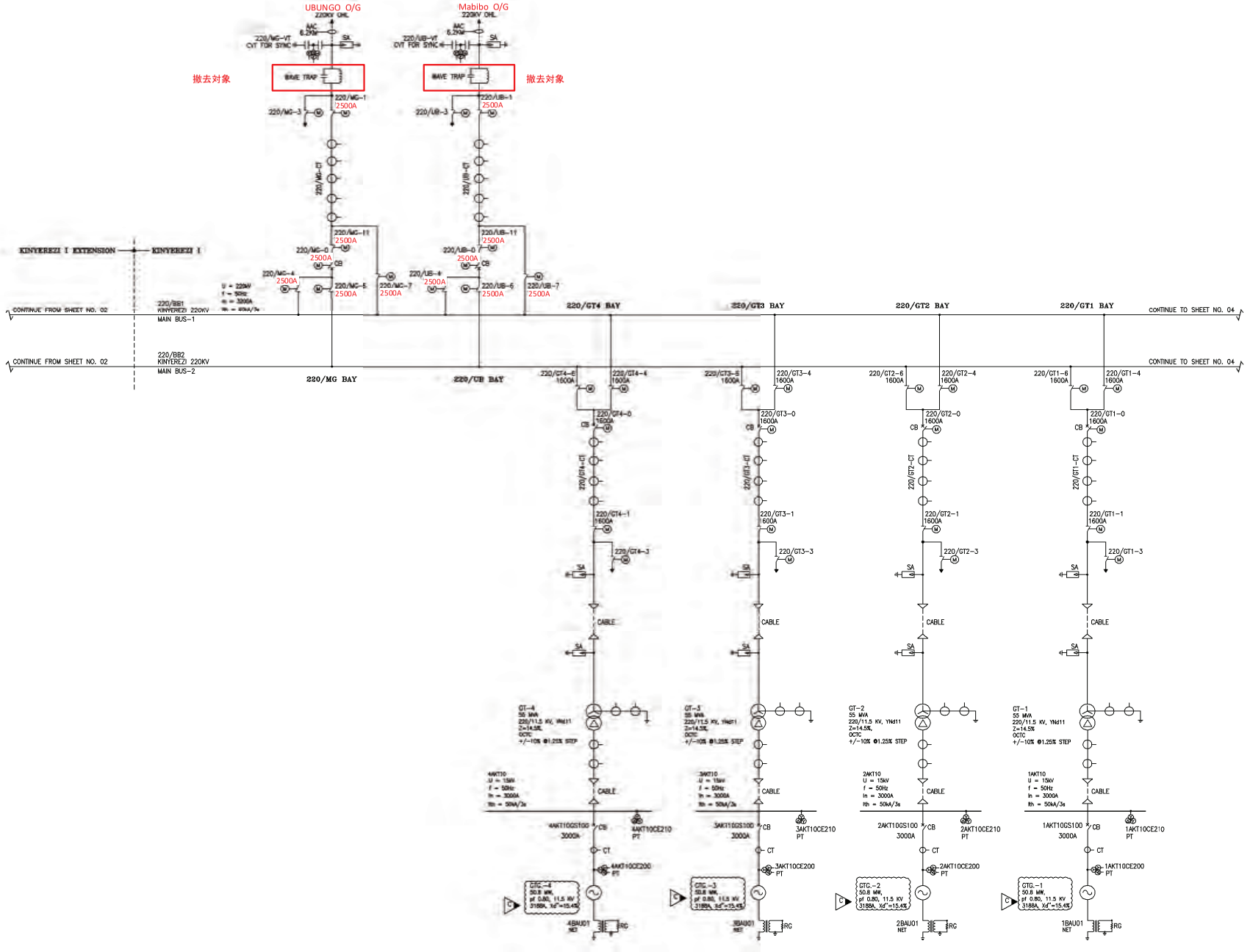
Switchgear Room

No.	Panel	Note
60	Auxiliary switchgear Incoming feeder Panel -1	
61	Auxiliary switchgear Incoming feeder Panel -2	
62	Auxiliary switchgear VT Panel	
63	Auxiliary switchgear Outgoing feeder	
64	Reactor feeder	By TANESCO
65	33kV Main Incoming feeder Panel-1	By TANESCO
66	33kV Main Incoming feeder Panel-2	By TANESCO
67	33kV Main Bus section panel	By TANESCO
68	33kV VT Panel	By TANESCO
69	33kV Feeder Panel x8	By TANESCO
70	Back UP Ayxiliary Switchgear	

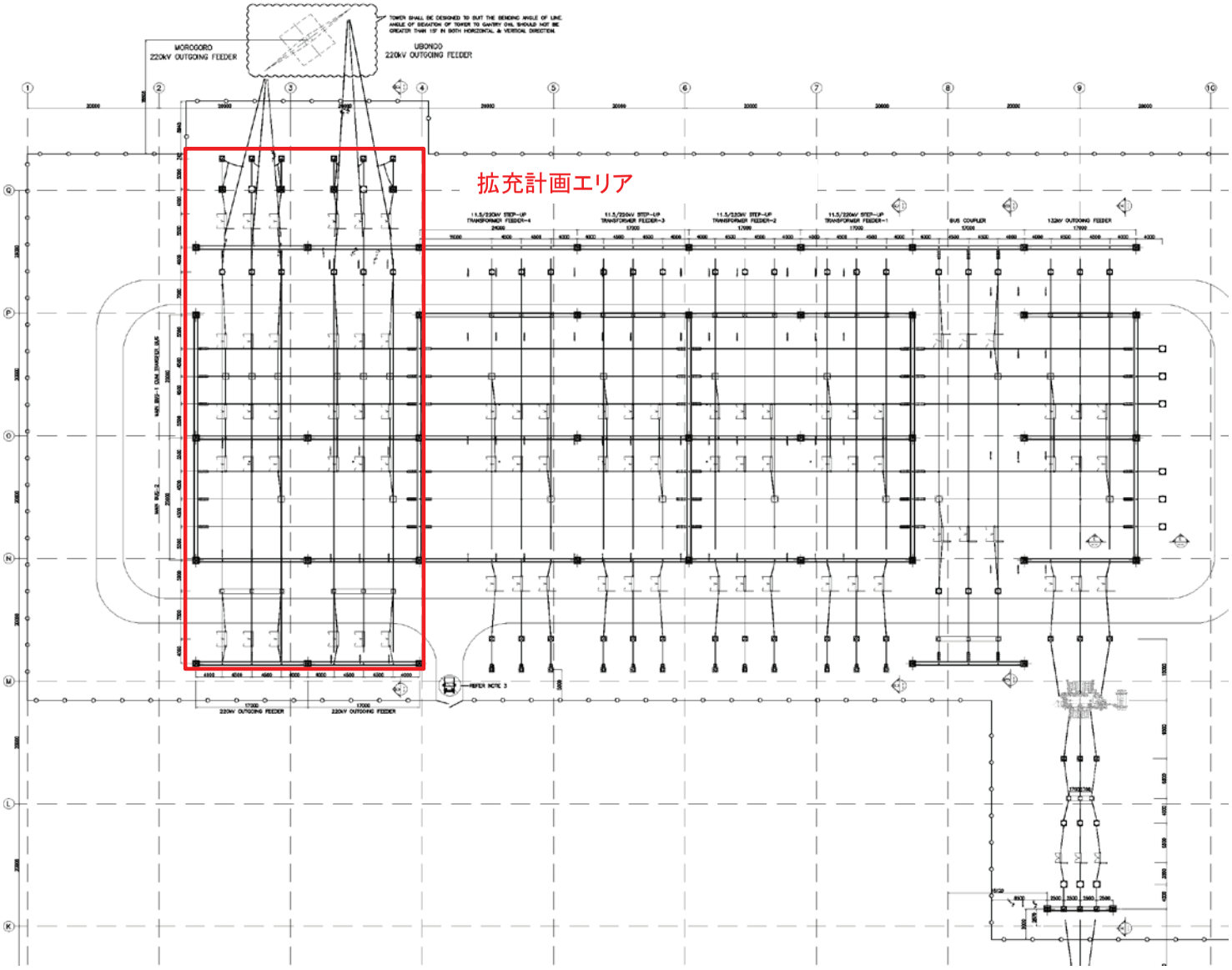
タンザニア国キネレジーウブンゴ電力供給強化計画準備調査				スケール NON
Title マビボ変電所制御棟建屋配置図				図番 SS-03
日付	作成	審査	承認	改定
2021年8月	中村	酒村	大橋	1
西日本技術開発株式会社				



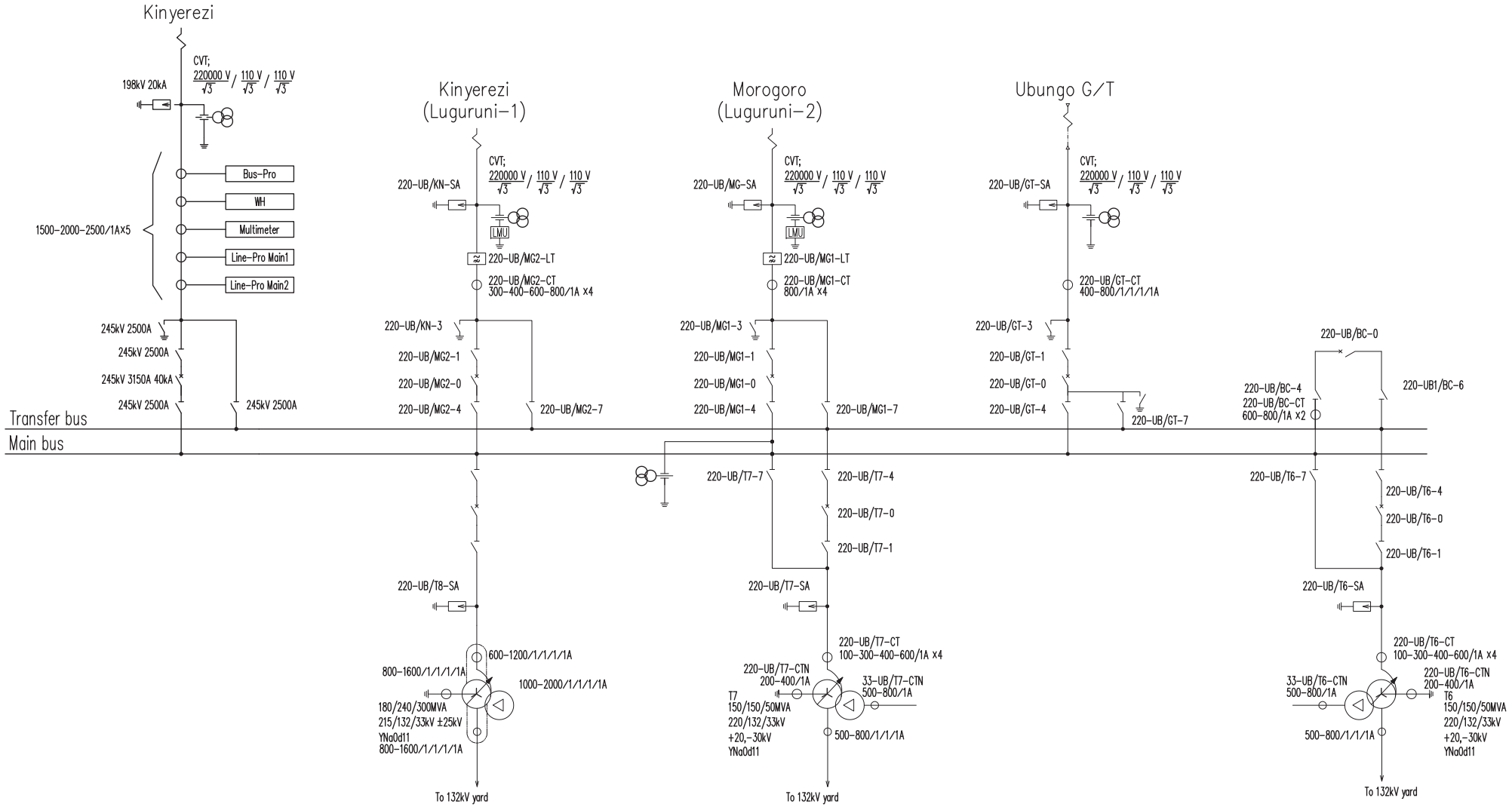
タンザニア国キネレジーウブンゴ電力供給強化計画準備調査				スケール NON
Title マビボ変電所システム構成図				図番 SS-04
日付	作成	審査	承認	改定
2020年2月	中村	酒村	大橋	1
西日本技術開発株式会社				



タンザニア国キネレジーウブンゴ 電力供給強化計画準備調査				スケール	
				NON	
Title 単線結線図（キネレジガス火力発電所）				図番	
				SS-05	
日付	作成	審査	承認	改定	
2020年1月	中村	酒村	大橋	0	



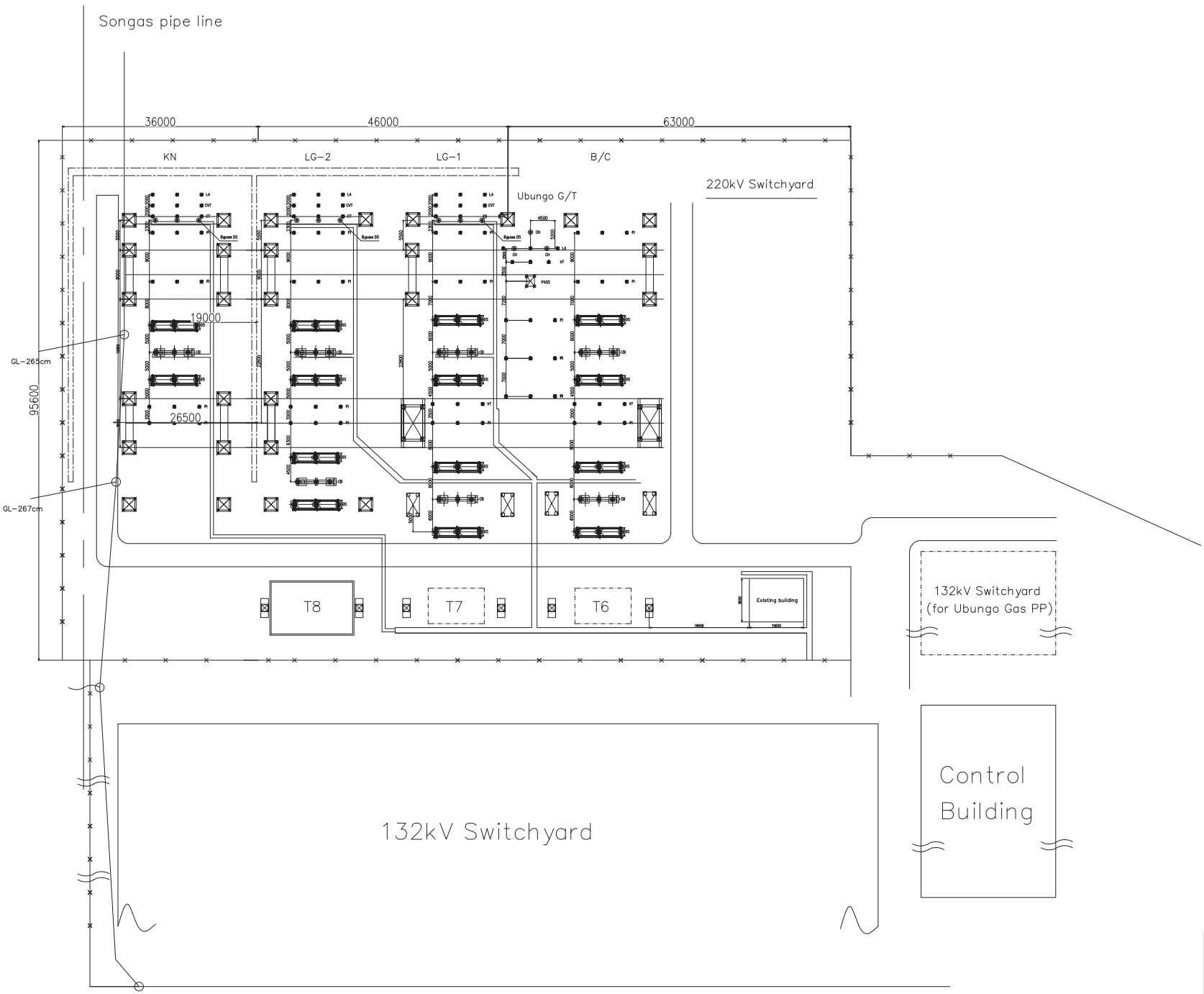
タンザニア国キネレジーウブンゴ 電力供給強化計画準備調査				スケール
				NON
Title 一般平面図（キネレジ火力発電所）				図番 SS-06
日付	作成	審査	承認	改定
2020年1月	中村	酒村	大橋	



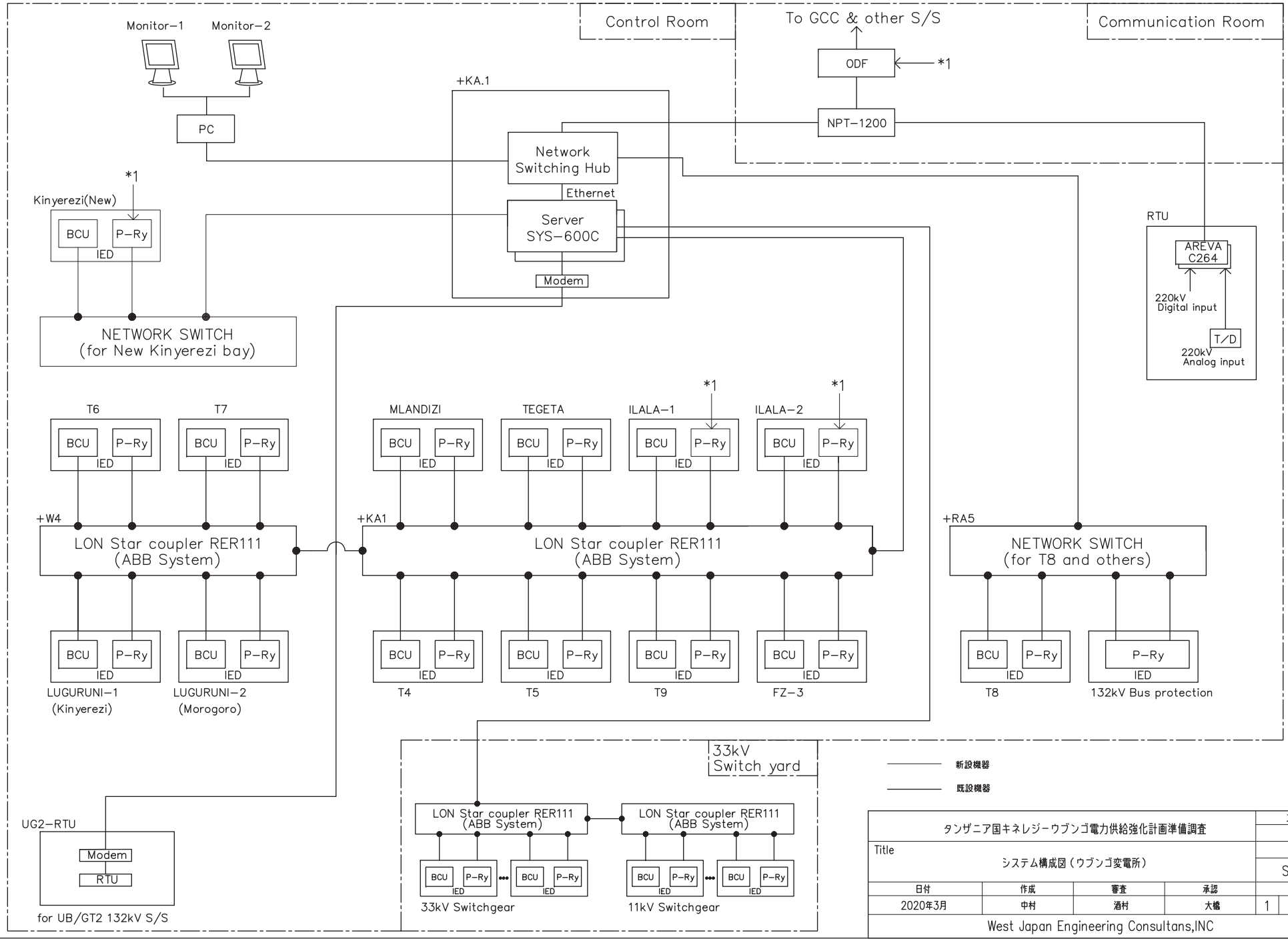
拡張範囲

既設範囲

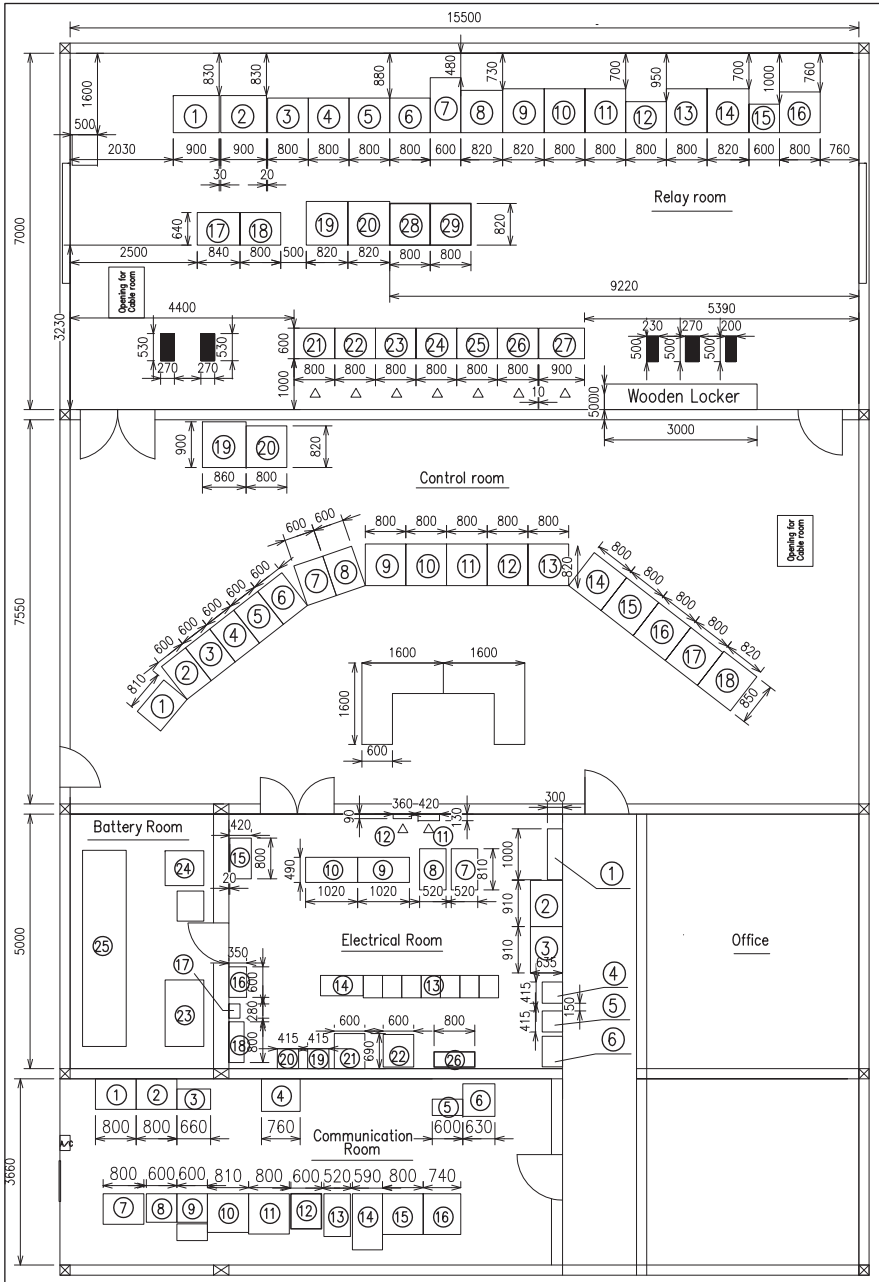
タンザニア国キネレジーウブンゴ電力供給強化計画準備調査				スケール	NON
Title 単線結線図（ウブンゴ220kV変電所）				図番	SS-07
日付	作成	審査	承認	日付	
2020年2月	中村	酒村	大橋		
西日本技術開発株式会社					



タンザニア国キネレジーウブンゴ電力供給強化計画準備調査				スケール 1:500 (220kV屋外変電設備のみ)
Title 一般平面図（ウブンゴ変電所）				図番 SS−08
日付	作成	審査	承認	REVISION
2020年3月	中村	酒村	大橋	1
西日本技術開発株式会社				



タンザニア国キネレジーウブンゴ電力供給強化計画準備調査				スケール
				NON
Title				図番
システム構成図（ウブンゴ変電所）				SS−09
日付	作成	審査	承認	改定
2020年3月	中村	酒村	大橋	1
West Japan Engineering Consultans,INC				



Relay Room

No.	Panel name	Panel No
1	48V DC Charger-2	
2	48V DC Charger-1	
3	Station RTU	UG2/RTU
4	132kV Buszone Protection Panel	RP-3
5	132kV Extention Sub Protection Panel	
6	GSU TRF'S Incomer Protection Panel	RP-1
7	SEL Contact Transfer Module cabinet	
8	Morogoro-1	R.10
9	Line Morogoro-2	+R.11
10	Line Morogoro-2	+R.12
11	Line Morogoro-1	+R.13
12	220kV Busbar Protection	RP.14
13	WH Meter Panel	+Q1
14	WH Meter Panel	+Q2
15	EPP-Feeder Protection Relay	
16	WH Meter Panel	MA.1
17	Line morogoro-2 Line morogoro-1	+XY1
18	New 132kV Revenue Metering Panel	+EP001
19	T8 TR Protection Panel	
20	T8 TR Control Panel	
21	Auxiliary Remote Terminal Unit	CMA1(BBC)
22	Auxiliary Remote Terminal Unit	CMA2(BBC)
23	Auxiliary Remote Terminal Unit	CMA3(BBC)
24	Remote terminal Unit	CRA1(BBC)
25	Remote terminal Unit	CRA2(BBC)
26	Terminal Panel	+YV1
27	DC 110V Charger-1(Hoppelke battery)	
28	Kinyerezi -1(New)	
29	Kinyerezi -2(New)	

Communication Room

No.	Panel name	Panel No
1	Telecom SDH/POH E-UBU-AD-001	
2	ABB Telecommunication (PLC) (Not in Use)	
3	BBC PLC(Not in Use)	
4	ABB Nara Communication Network	
5	ECI XDM1000 Cabinet	
6	Symmetricom Cabinet(include SSU-20000)	
7	Telephone Ecchange ECS-FD400	
8	PLC Siemense ESB2000i(Not in Use)	
9	PLC Siemense ESB2000i(Not in Use)	
10	ABB Telecom Cabinet(include FOX515)	
11	Telecom1 UBUNGO 220kV(Include SDH/MUX) RIN0:UBUNGO 220-1 RIN1:UBUNGO 220-2	
12	ODF Cabinet	
13	UPS	
14	Server Cabinet	
15	PLC	
16	MEGAPLEX Cabinet	

Control Room

No.	Panel name	Panel No
1	220kV Cable Feeder	RP01
2	Alarem Panel	W1
3	Morogoro-2	W2
4	Transformer T7	W3
5	Bus Coupler	W4
6	33kV Reactors	W5
7	Transfomrmer T6	W6
8	Morogoro-1	W7
9	DOWANS	RA.1
10	Factory zone3/ ILALA1	RA.2
11	ILALA2/ Transformer T5	RA.3
12	Transformer T7/Bus section	RA.4
13	Blank Panel(Network switch for New T8)	RA.5
14	Transformer T4 /Transformer T6	RA.6
15	TEGETA / Mlandizi	RA.7
16	Transformer T9/MAKMBUSHO	RA.8
17	Alarm	KA.1
18	TEGETA-2	RA.10
19	Kurasini	
20	Kinyerezi(NEW)	

Electrical Room

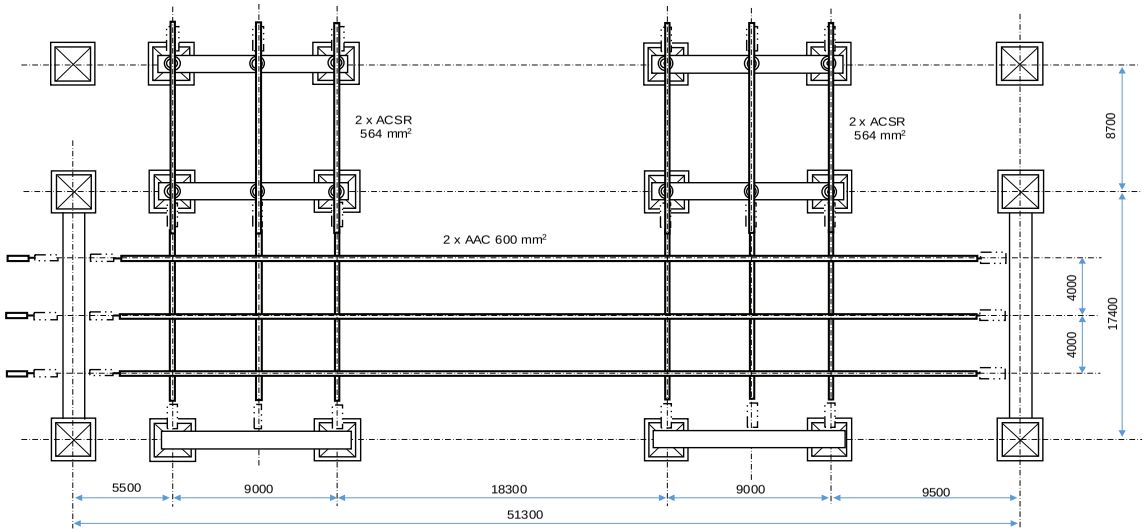
No.	Panel name	Panel No
1	DC Distribution panel	SD1
2	Battery Charger	
3	Battery Charger	
4	Battery Charger / Rectifier (Wall mounted)	
5	Battery Charger / Rectifier (Wall mounted)	
6	DC Distribution panel (Wall mounted)	
7	UPS (Schneider)	
8	UPS (Schneider)	
9	Distribution Panel (110 V DC) (2)	
10	Distribution Panel (110 V DC) (1)	
11	400/230 V AC DP(for outdoor lighting)	+DLP
12	DP for A/C, Lighting and receptacles	
13	Control Center	
14	Distribution Panel (for 230 V AC)	
15	Distribution Panel	
16	15 V DC Battery Charger (Wall mounted)	
17	Fuse (Wall mounted)	
18	AC/DC Distribution Panel (Wall mounted)	+SD3
19	48 V DC Charger / Rectifier (Wall mounted)	
20	48 V DC Charger / Rectifier (Wall mounted)	
21	Unknown (operating?)	
22	Communication ODF Cabinet (not in use)	
23	48 V DC Batteries (Ni-Cd)	
24	110 V DC Batteries (Ni-Cd)	
25	Batteries (Ni-Cd)	
26	AC/DC Distribution Panel(New kinyerezi Bay)	

新設及び改造対象盤

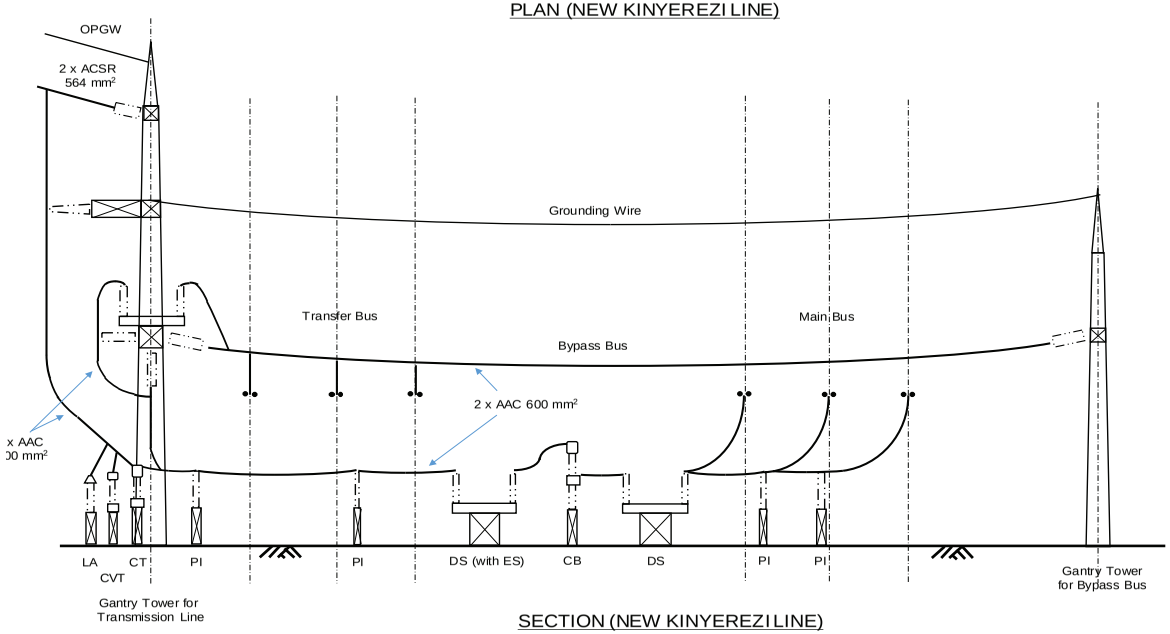
既設盤

開口部（鉄板養生中）

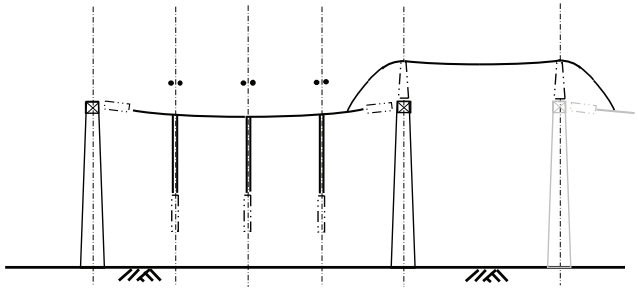
タンザニア国キネレジーウブンゴ電力供給強化計画準備調査				スケール NON
Title 制御棟建屋配置図（ウブンゴ変電所）				図番 SS-10
日付	作成	審査	承認	改定
2020年1月	中村	酒村	大橋	1
西日本技術開発株式会社				



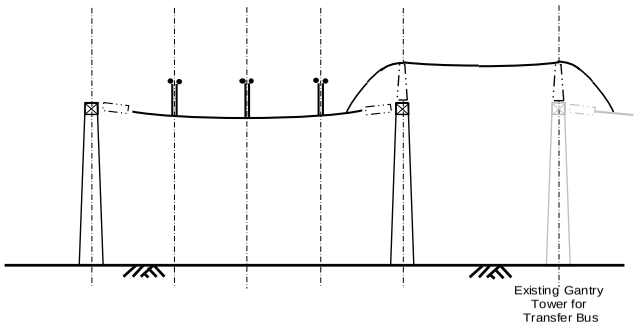
PLAN (NEW KINYEREZI LINE)



SECTION (NEW KINYEREZI LINE)

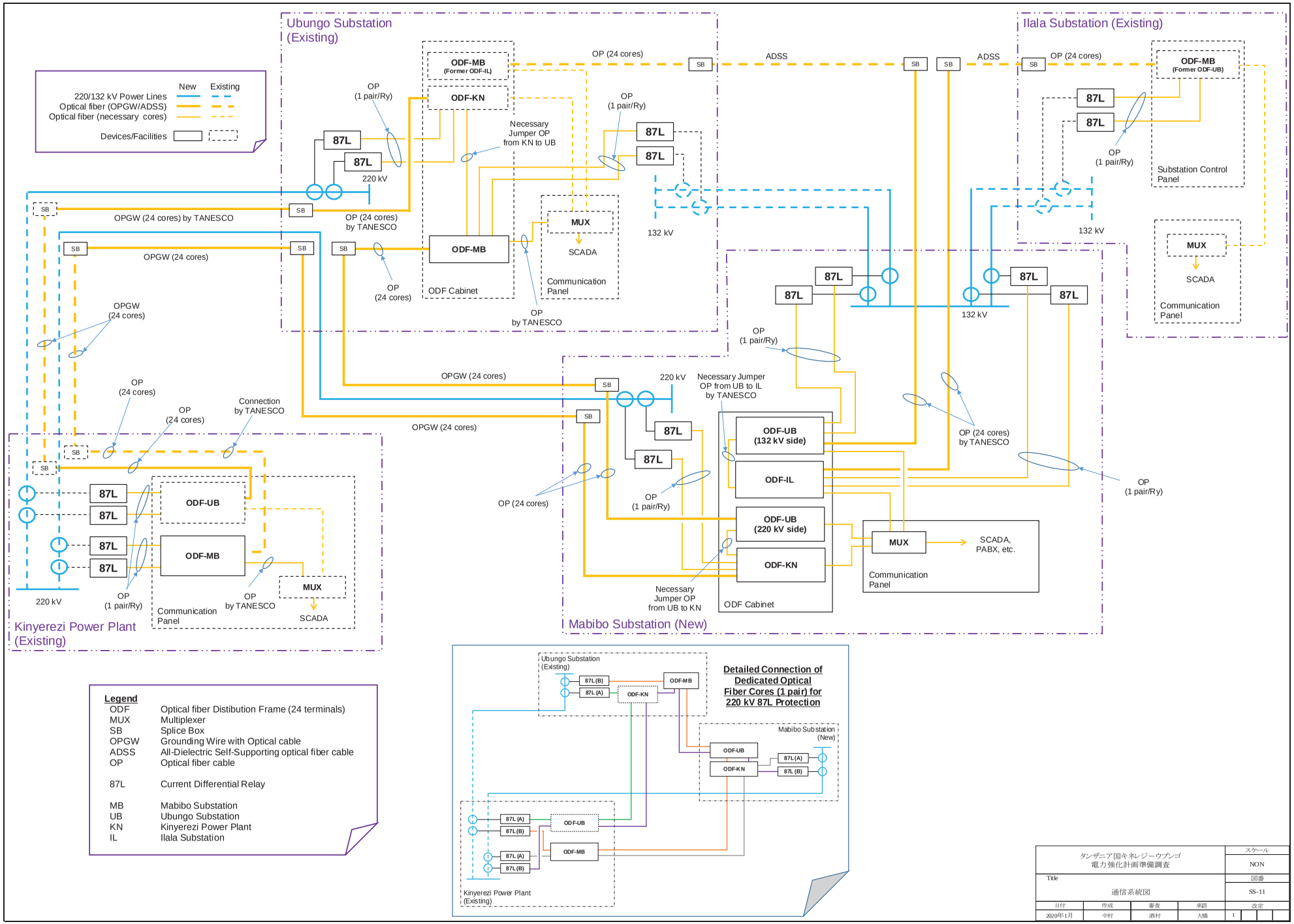


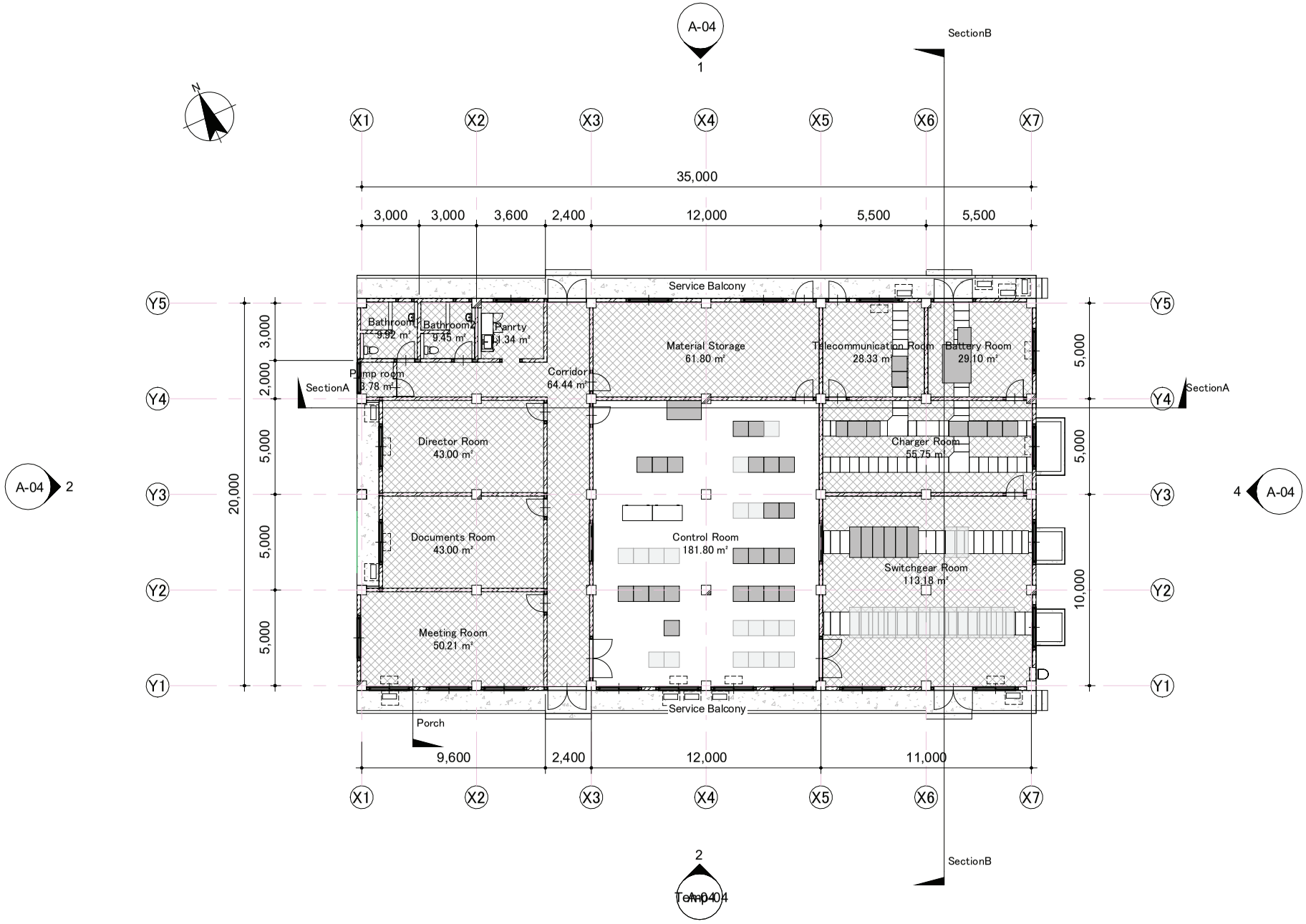
SECTION (MAIN BUS)



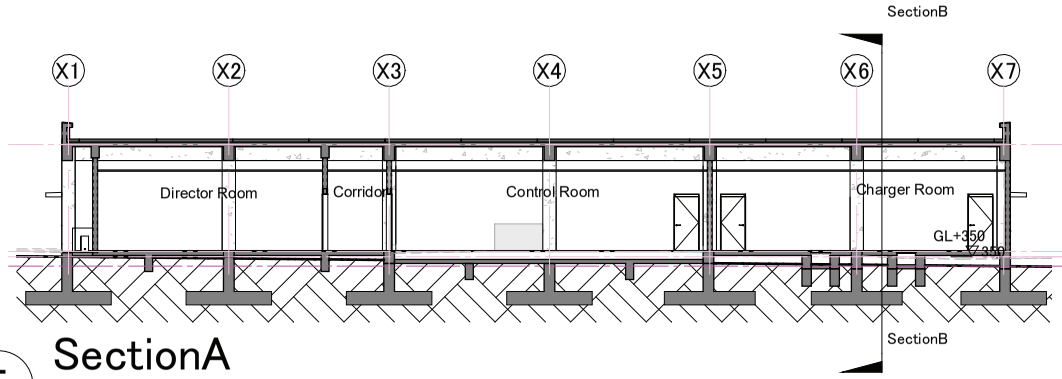
SECTION (TRANSFER BUS)

タンザニア国キネレジーウブンゴ 電力強化計画準備調査				スケール NON
Title ウブンゴ変電所側面図				図番 SS-11
日付	作成	審査	承認	改定
2020年1月	中村	酒村	大橋	


New
Existing
220/132 kV Power Lines
Optical fiber (OPGW/ADSS)
Optical fiber (necessary cores)
Devices/Facilities
Ubungo Substation (Existing)
ODF-MB (Former ODF-IL)
ODF-KN
OP (24 cores)
ADSS
OP (1 pair/Ry)
87L
220 kV
Necessary Jumper OP from KN to UB
132 kV
OPGW (24 cores) by TANESCO
OP (24 cores) by TANESCO
OPGW (24 cores)
ODF-MB
MUX
SCADA
Communication Panel
ODF Cabinet
OP by TANESCO
Ilala Substation (Existing)
ODF-MB (Former ODF-UB)
Substation Control Panel
OPGW (24 cores)
Connection by TANESCO
Kinyerezi Power Plant (Existing)
ODF-UB
ODF-MB
MUX
SCADA
Communication Panel
Mabibo Substation (New)
ODF-UB (132 kV side)
ODF-IL
ODF-UB (220 kV side)
ODF-KN
Necessary Jumper OP from UB to IL by TANESCO
Necessary Jumper OP from UB to KN
SCADA, PABX, etc.
ODF Cabinet
Legend
ODF Optical fiber Distibution Frame (24 terminals)
MUX Multiplexer
SB Splice Box
OPGW Grounding Wire with Optical cable
ADSS All-Dielectric Self-Supporting optical fiber cable
OP Optical fiber cable
87L Current Differential Relay
MB Mabibo Substation
UB Ubungo Substation
KN Kinyerezi Power Plant
IL Ilala Substation
Detailed Connection of Dedicated Optical Fiber Cores (1 pair) for 220 kV 87L Protection
87L (A)
87L (B)
タンザニア国キネレジーウブンゴ
電力強化計画準備調査
スケール
NON
Title
通信系統図
図番
SS-11
日付
作成
審査
承認
改定
2020年1月
中村
酒井
大橋

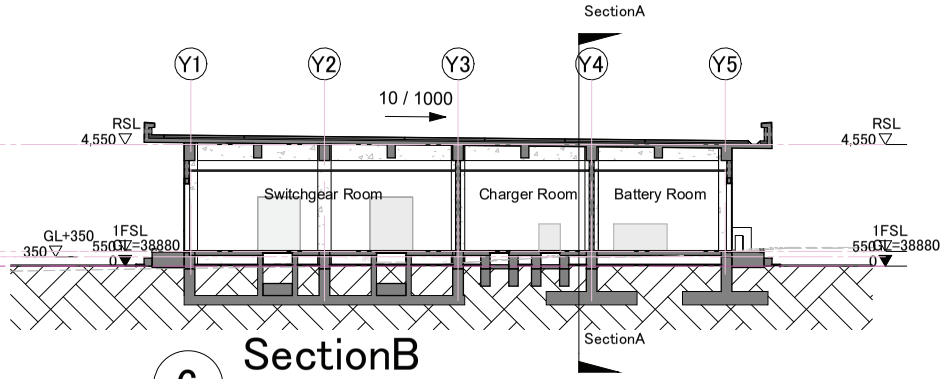


Project	Location	Title	Approved by	Checked by	Designed by	Drawn by	Date	Dwg No.
タンザニア国キネレジーウブンゴ 電力供給強化計画	ダルエスサラーム	1階平面図						A-03
			Consultant		YACHIYO ENGINEERING CO., LTD. TOKYO, JAPAN			Scale 1 : 200 (for A3 paper)



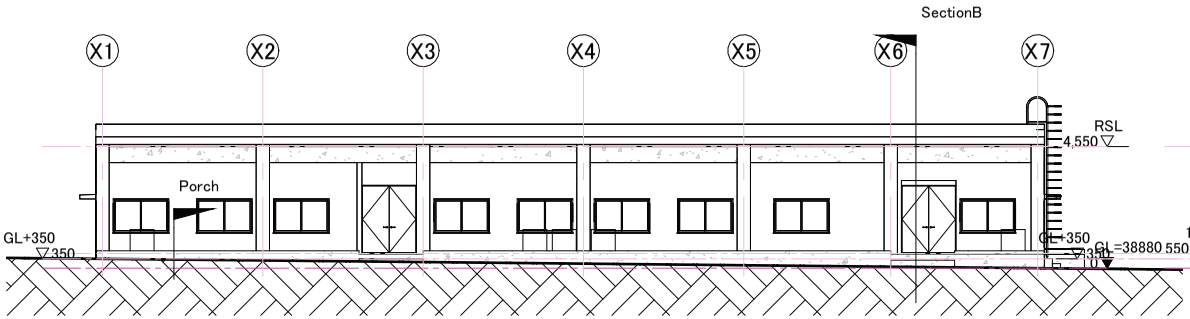
5 SectionA

1 : 200



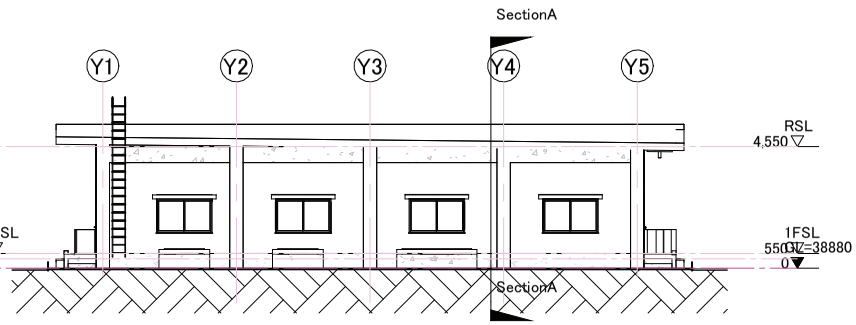
6 SectionB

1 : 200



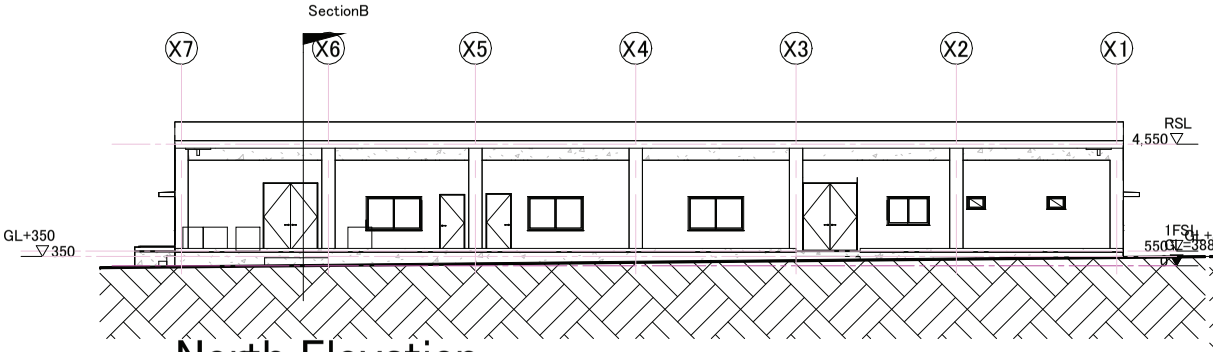
3 South Elevation

1 : 200



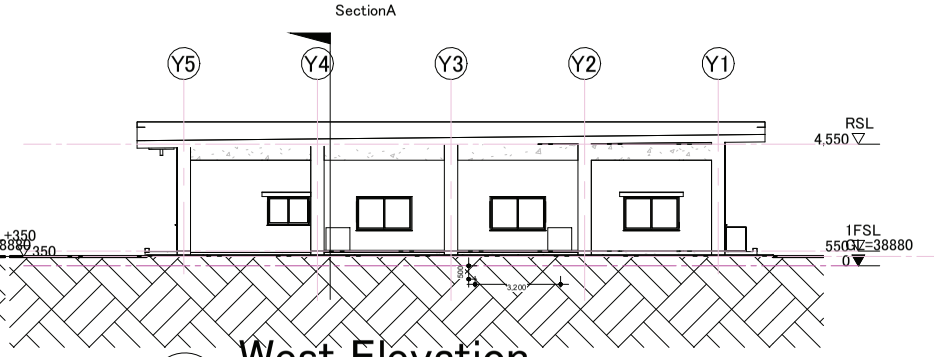
4 East Elevation

1 : 200



1 North Elevation

1 : 200



2 West Elevation

1 : 200

Project	Location	Title	Approved by	Checked by	Designed by	Drawn by	Date	Dwg No.
タンザニア国キネレジーウブンゴ 電力供給強化計画	ダルエスサラーム	立面図・断面図						A-04
			Consultant					Scale
			YACHIYO ENGINEERING CO., LTD. TOKYO, JAPAN					1 : 200 (for A3 paper)

送電設備


T1
π分岐点
引留鉄塔 (3D-1)
220 kV, 3回線
緯度:517321.95 m E
経度:9247688.36 m S
T2
耐張鉄塔(3B)
220 kV, 3回線
緯度:517503.00 m E
経度:9247725.00 m S
T3
懸垂鉄塔(3A)
220 kV, 3回線
緯度:517951.00 m E
経度:9247819.00 m S
184.72 m
L0° 25′
457.76 m
L0° 3′
454.15 m

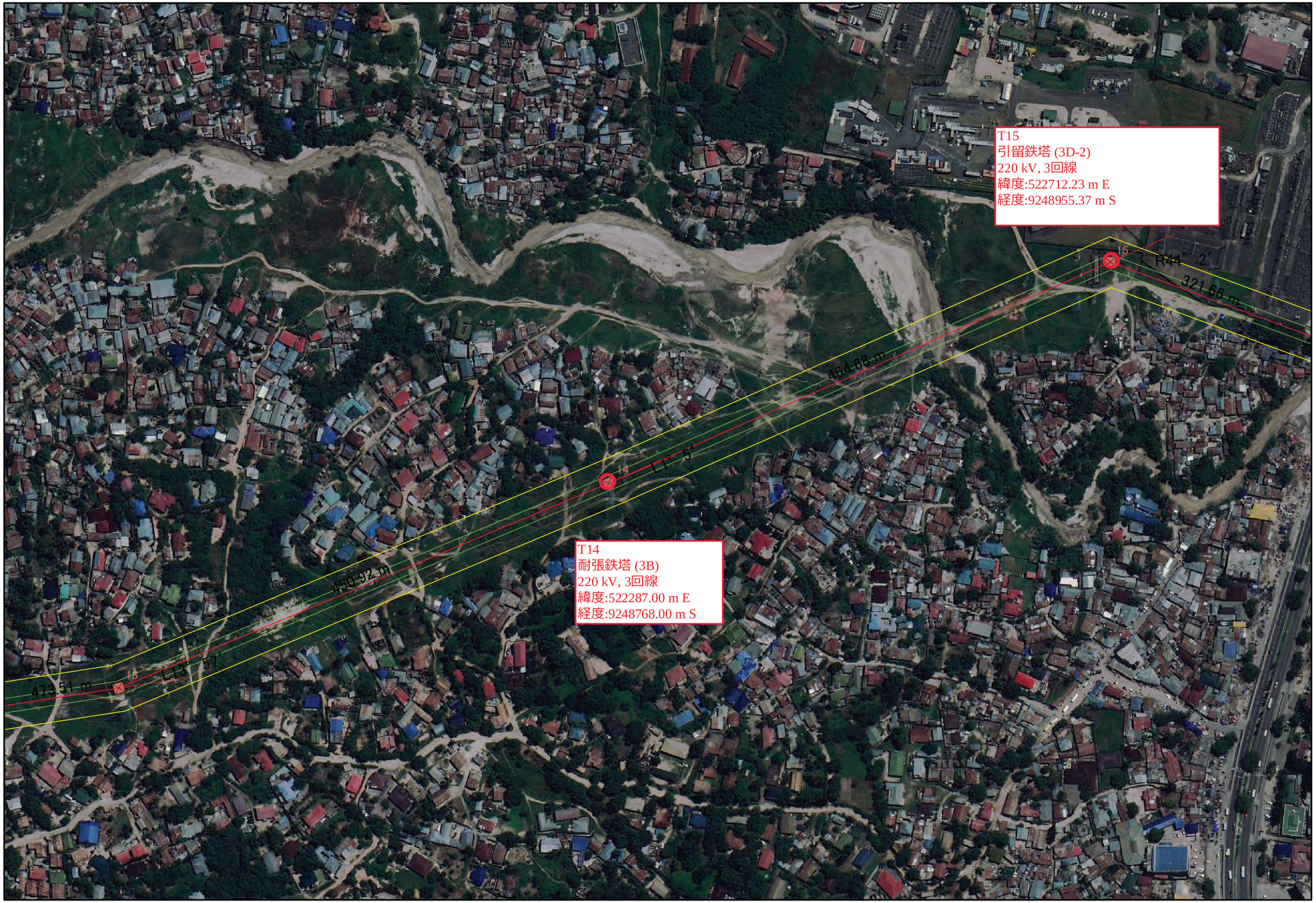

T5
懸垂鉄塔(3A)
220 kV, 3回線
緯度:518867.00 m E
経度:9248013.00 m S
T4
引留鉄塔(3C)
220 kV, 3回線
緯度:518395.38 m E
経度:9247912.68 m S
482.17 m
454.15 m
457.76 m
L0° 6′
L0° 3′


T7
引留鉄塔(3C)
220 kV, 3回線
緯度:519587.50 m E
経度:9248160.89 m S
T6
懸垂鉄塔(3A)
220 kV, 3回線
緯度:519171.00 m E
経度:9248075.00 m S
482.17 m
R0° 29′
310.26 m
L0° 8′
425.27 m
L0° 41′
393.59 m


T9
懸垂鉄塔(3A)
220 kV, 3回線
緯度:520297.11 m E
経度:9248310.91 m S
T8
懸垂鉄塔 (3A)
220 kV, 3回線
緯度:519972.00 m E
経度:9248245.00 m S
425.27 m
L0° 41'
393.59 m
R0° 53'
331.73 m
L0° 44'
476.68 m


T10
引留鉄塔(3C)
220 kV, 3回線
緯度:520763.04 m E
経度:9248411.59 m S
T11
懸垂鉄塔(3A)
220 kV, 3回線
緯度:521037.00 m E
経度:9248461.00 m S
476.68 m
L0° 44′
R1° 58′
278.37 m
R0° 46′
371.05 m
31.73 m

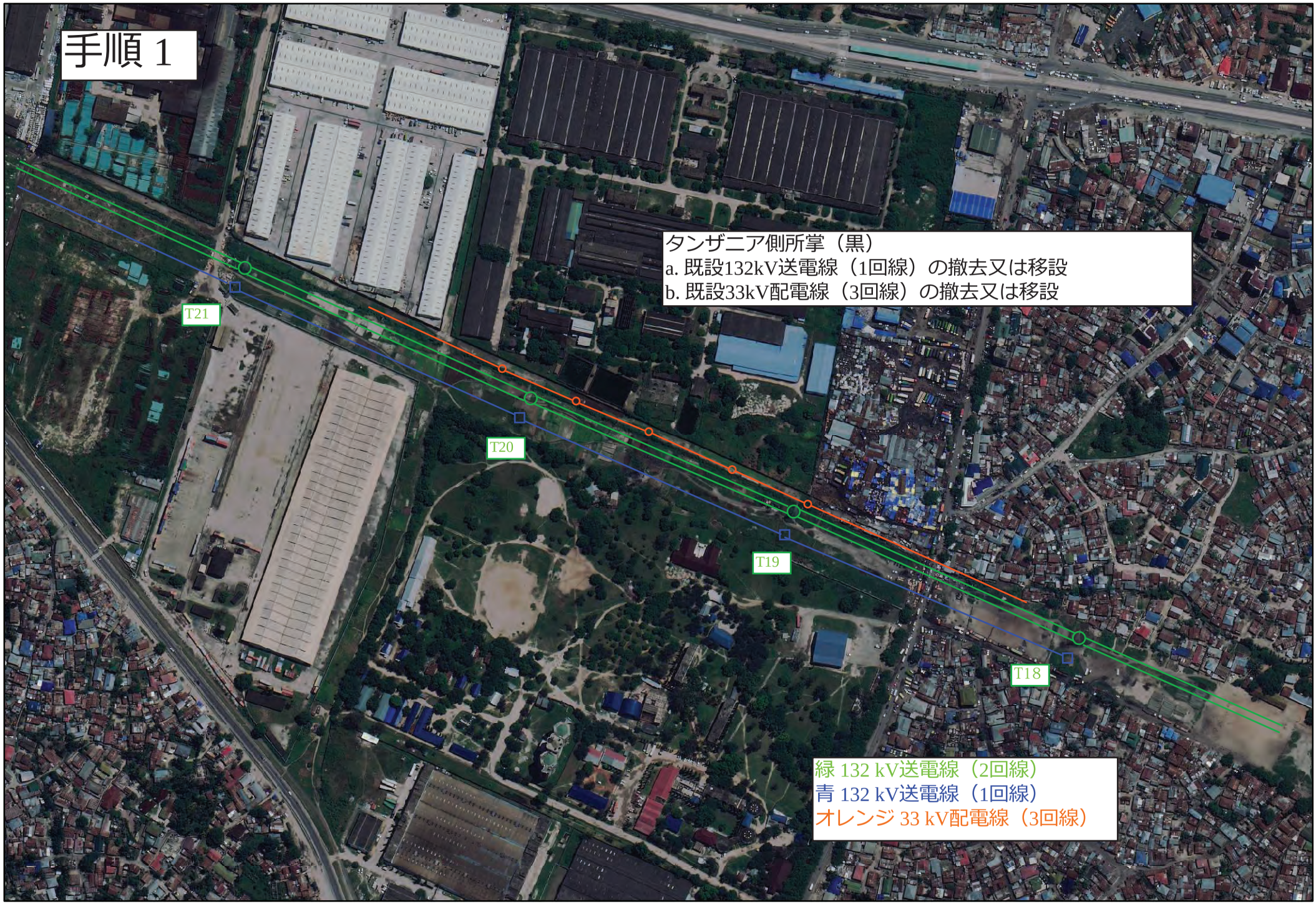

T12
懸垂鉄塔(3A)
220 kV, 3回線
緯度:521403.00 m E
経度:9248522.00 m S
T13
耐張鉄塔 (3B)
220 kV, 3回線
緯度:521871.00 m E
経度:9248594.00 m S
278.37 m
R0° 46'
371.05 m
R0° 43'
473.51 m
L3° 57'
450.97 m


T15
引留鉄塔 (3D-2)
220 kV, 3回線
緯度:522712.23 m E
経度:9248955.37 m S
T14
耐張鉄塔 (3B)
220 kV, 3回線
緯度:522287.00 m E
経度:9248768.00 m S
15
14
13
R44° 2'
321.66 m
464.68 m
450.92 m
473.51 m


15
R44° 2′
464.68 m
321.66 m
16
14° 16′
230.25 m
17
R17° 44′
308.65 m
18
R0° 18′
T16
引留鉄塔 (2C)
220 kV, 2回線
緯度:523014.00 m E
経度:9248844.00 m S
T17
引留鉄塔 (2C)
220 kV, 2回線
緯度:523243.00 m E
経度:9248820.00 m S
T18
懸垂鉄塔(2A)
220 kV, 2回線
緯度:523525.60 m E
経度:9248695.89 m S

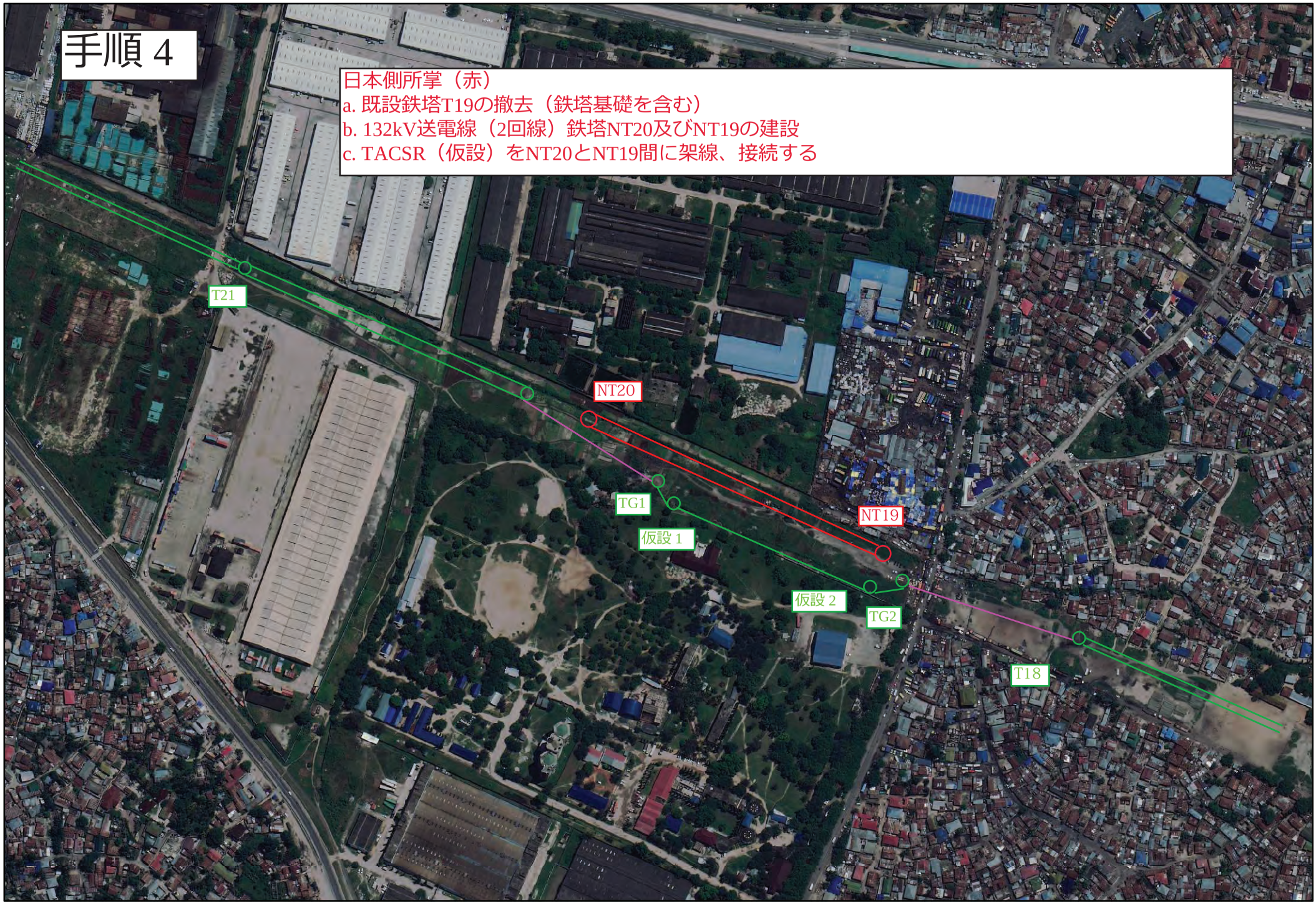

T19
懸垂鉄塔(2A)
220 kV, 2回線
緯度:523818.00 m E
経度:9248558.00 m S
318.64 m
19
R0° 44'
323.54 m
T20
懸垂鉄塔 (2A)
220 kV, 2回線
緯度:524107.00 m E
経度:9248425.00 m S
20
R0° 30'
332.7 m
T21
懸垂鉄塔 (2A)
220 kV, 2回線
緯度:524411.00 m E
経度:9248288.00 m S
T22
引留鉄塔 (2D)
220 kV, 2回線
緯度:524514.00 m E
経度:9248237.00 m S
21
101.14 m
L0° 39'
22


現在の状況
T21
T20
T19
T18
緑 132 kV送電線（2回線）
青 132 kV送電線（1回線）
オレンジ 33 kV配電線（3回線）

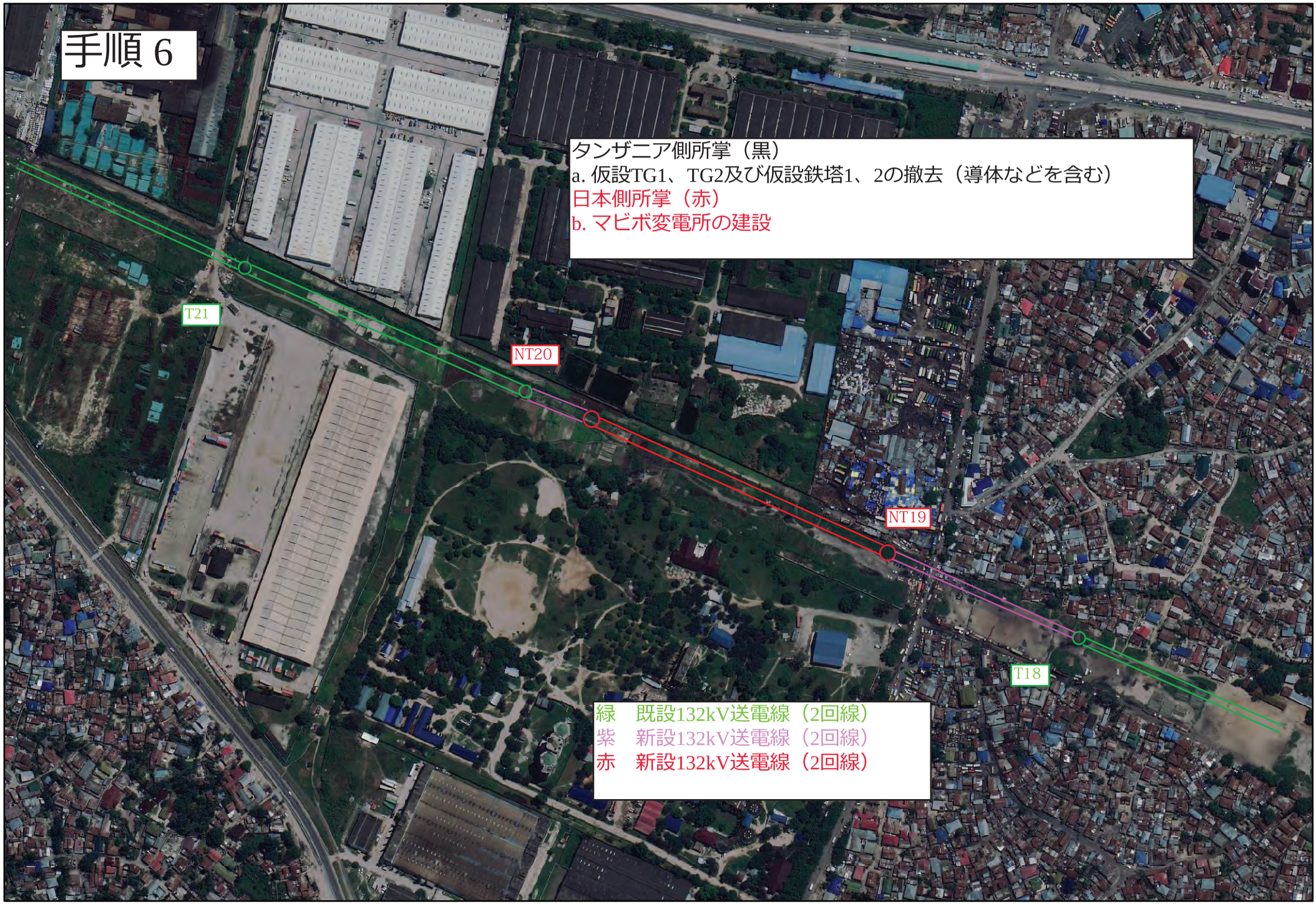

手順 1
タンザニア側所掌（黒）
a. 既設132kV送電線（1回線）の撤去又は移設
b. 既設33kV配電線（3回線）の撤去又は移設
T21
T20
T19
T18
緑 132 kV送電線（2回線）
青 132 kV送電線（1回線）
オレンジ 33 kV配電線（3回線）

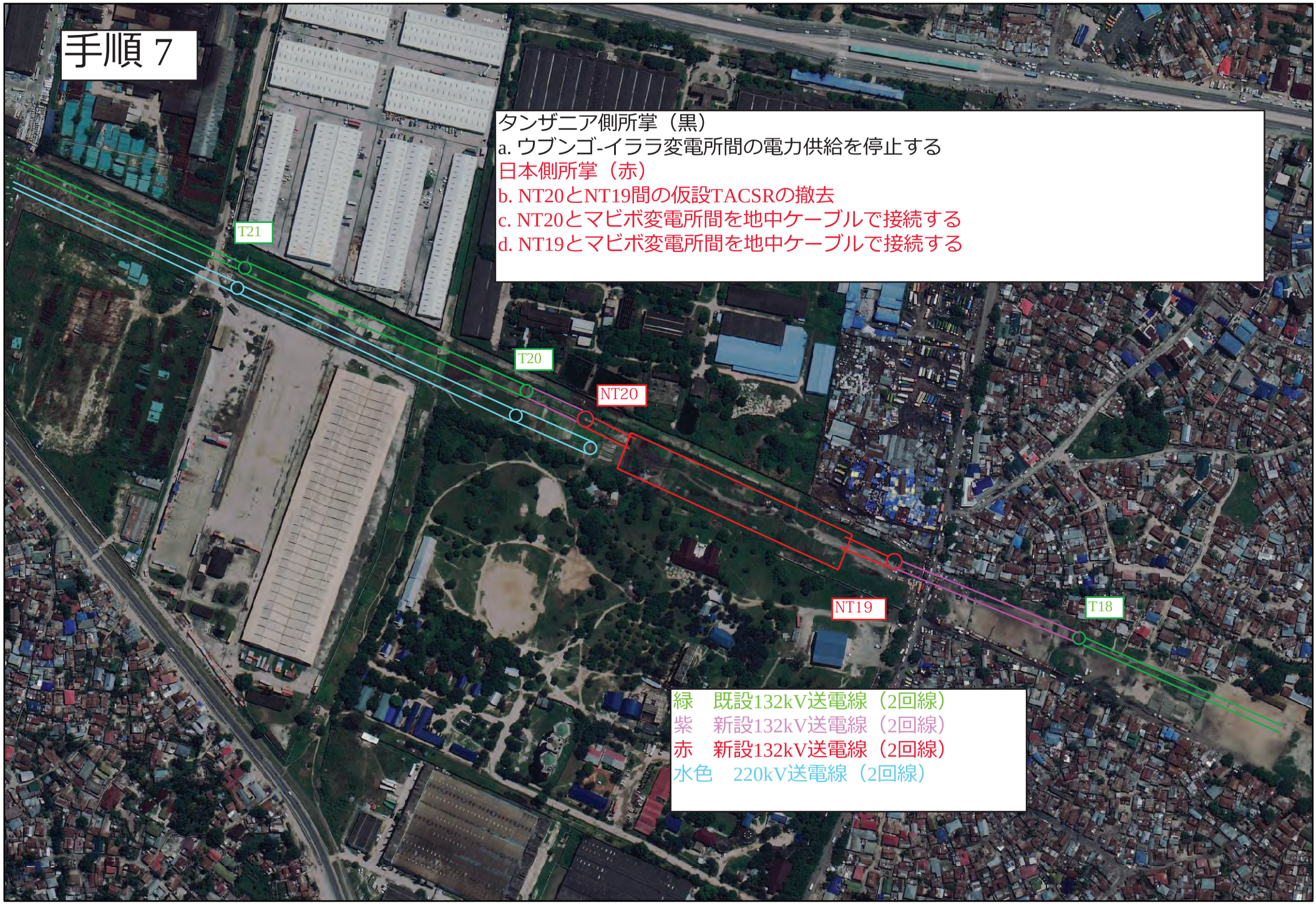

手順 2
タンザニア側所掌（黒）
a. 仮設ガントリーTG1とTG2を建設し、T20及びT18からの架線を支持する。
b. 132kV送電線（1回線又は2回線）仮設鉄塔1及び2を建設し、架線する。
T21
T20
TG1
T19
仮説 1
TG2
仮説 2
T18

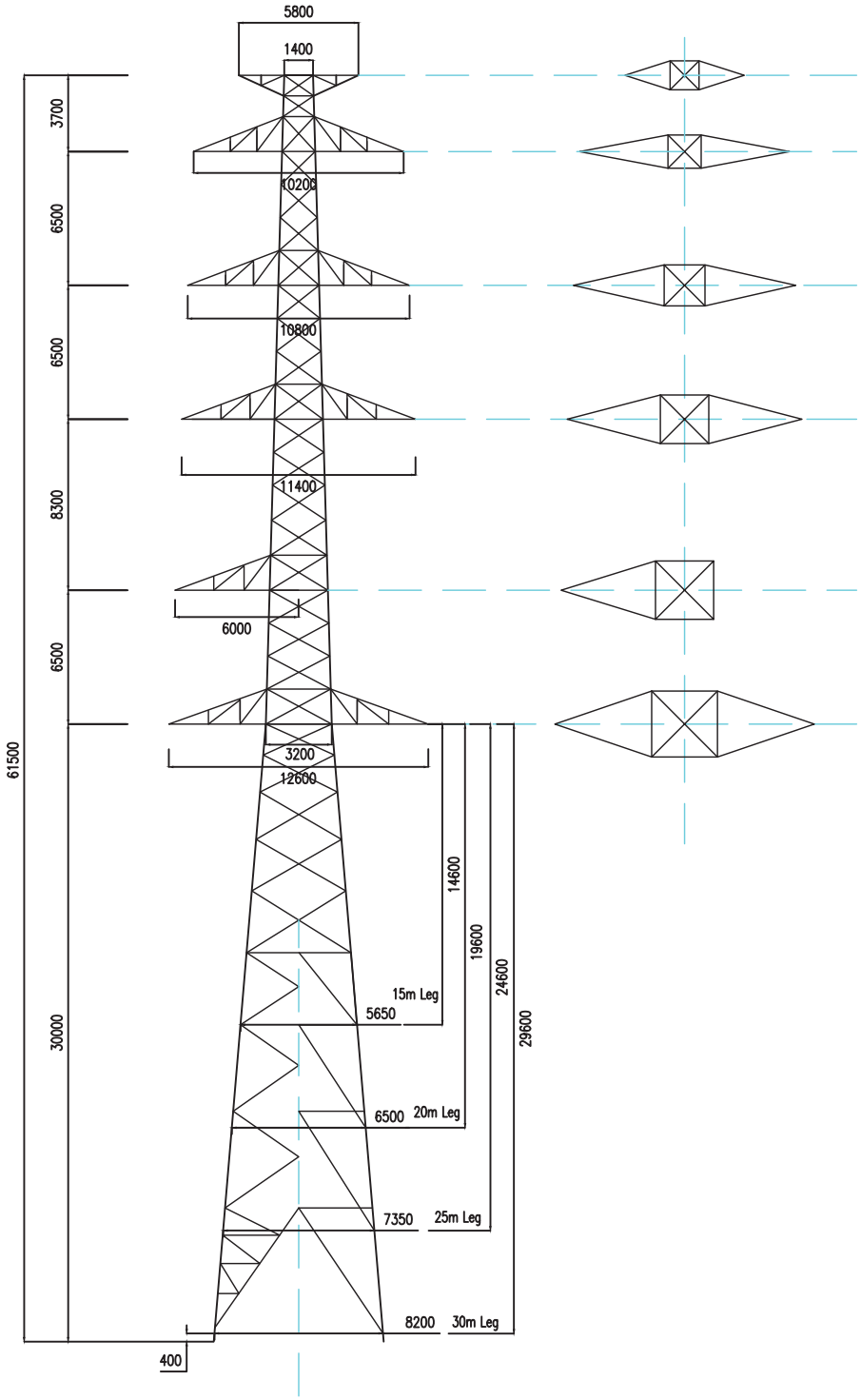

手順 3
タンザニア側所掌（黒）
a. ウブンゴ-イララ変電所間の電力供給を停止する
b. 既設T20と仮設TG1間を架線、接続する
c. 既設T18と仮設TG2間を架線、接続する
（機材及び材料の調達、据付はタンザニア側所掌）
T21
T20
TG1
T19
仮設 1
仮設 2
TG2
T18


手順 4
日本側所掌（赤）
a. 既設鉄塔T19の撤去（鉄塔基礎を含む）
b. 132kV送電線（2回線）鉄塔NT20及びNT19の建設
c. TACSR（仮設）をNT20とNT19間に架線、接続する
T21
NT20
TG1
仮設 1
NT19
仮設 2
TG2
T18


手順５
タンザニア側所掌（黒）
a. ウブンゴ-イララ変電所間の電力供給を停止する。
b. 既設T20と新設NT20間を架線、接続する
c. 既設T18と新設NT19間を架線、接続する
（T20とNT20間及びT18とNT19間の導体等は日本側で調達する。T20及びT18の碍子等はタンザニア側で調達する。）
d. T20とTG1間の導体を撤去する
e. T18とTG2間の導体を撤去する
T21
T20
NT20
TG1
仮設１
NT19
仮設２
TG2
T18


手順 6
タンザニア側所掌（黒）
a. 仮設TG1、TG2及び仮設鉄塔1、2の撤去（導体などを含む）
日本側所掌（赤）
b. マビボ変電所の建設
T21
NT20
NT19
T18
緑　既設132kV送電線（2回線）
紫　新設132kV送電線（2回線）
赤　新設132kV送電線（2回線）


手順 7
タンザニア側所掌（黒）
a. ウブンゴ-イララ変電所間の電力供給を停止する
日本側所掌（赤）
b. NT20とNT19間の仮設TACSRの撤去
c. NT20とマビボ変電所間を地中ケーブルで接続する
d. NT19とマビボ変電所間を地中ケーブルで接続する
T21
T20
NT20
NT19
T18
緑　既設132kV送電線（2回線）
紫　新設132kV送電線（2回線）
赤　新設132kV送電線（2回線）
水色　220kV送電線（2回線）

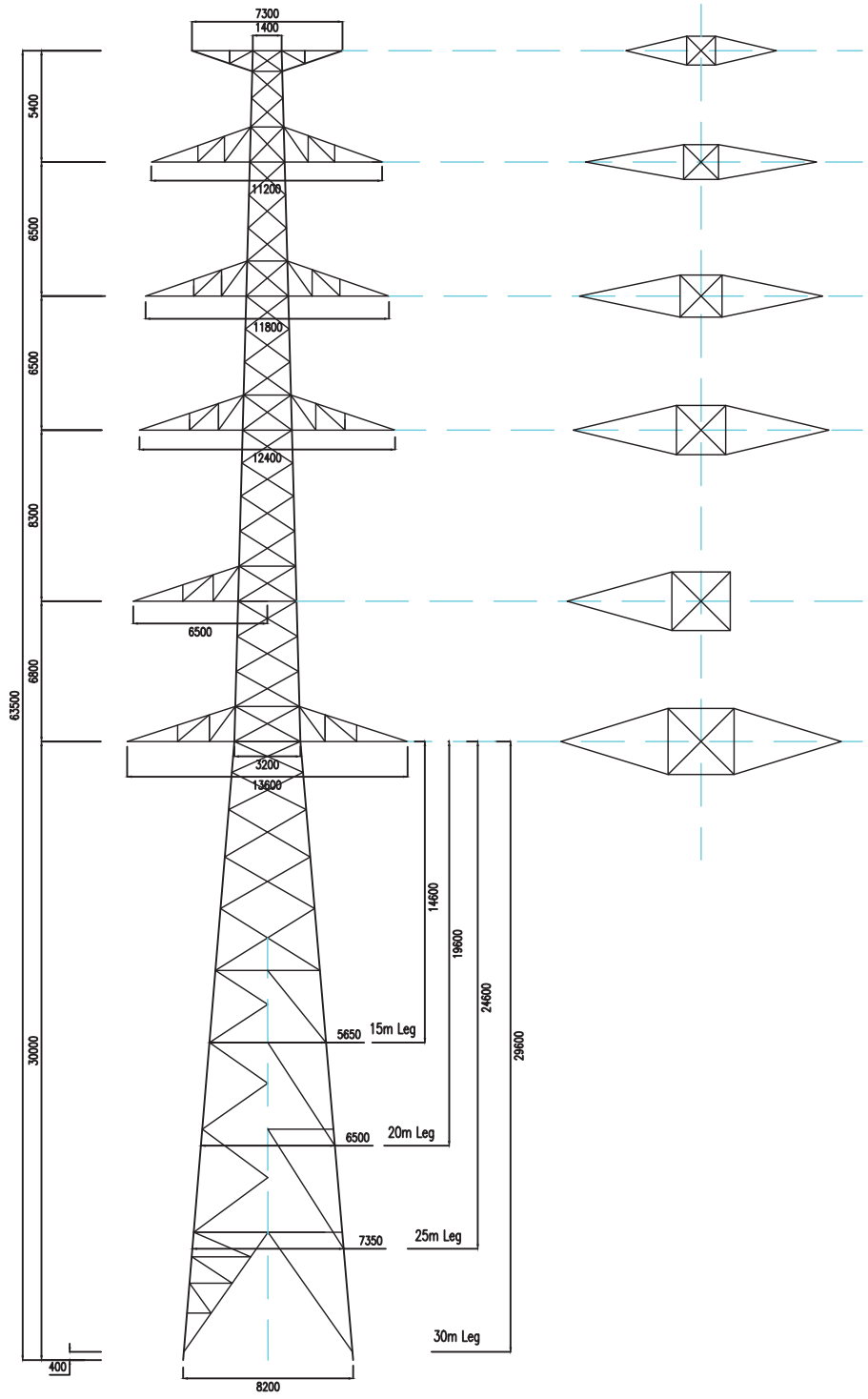


Front : マビボ変電所側

REFERENCE ONLY

タンザニア国キネレジ-ウブンゴ 電力供給強化計画				SCALE
Title 220 kV送電線（3回線） 鉄塔（220-3A）				DWG. No. TL-KU-1
DATE	DESIGNED	CHECKED	APPROVED	REVISION

YACHIYO ENGINEERING CO., LTD.
TOKYO, JAPAN



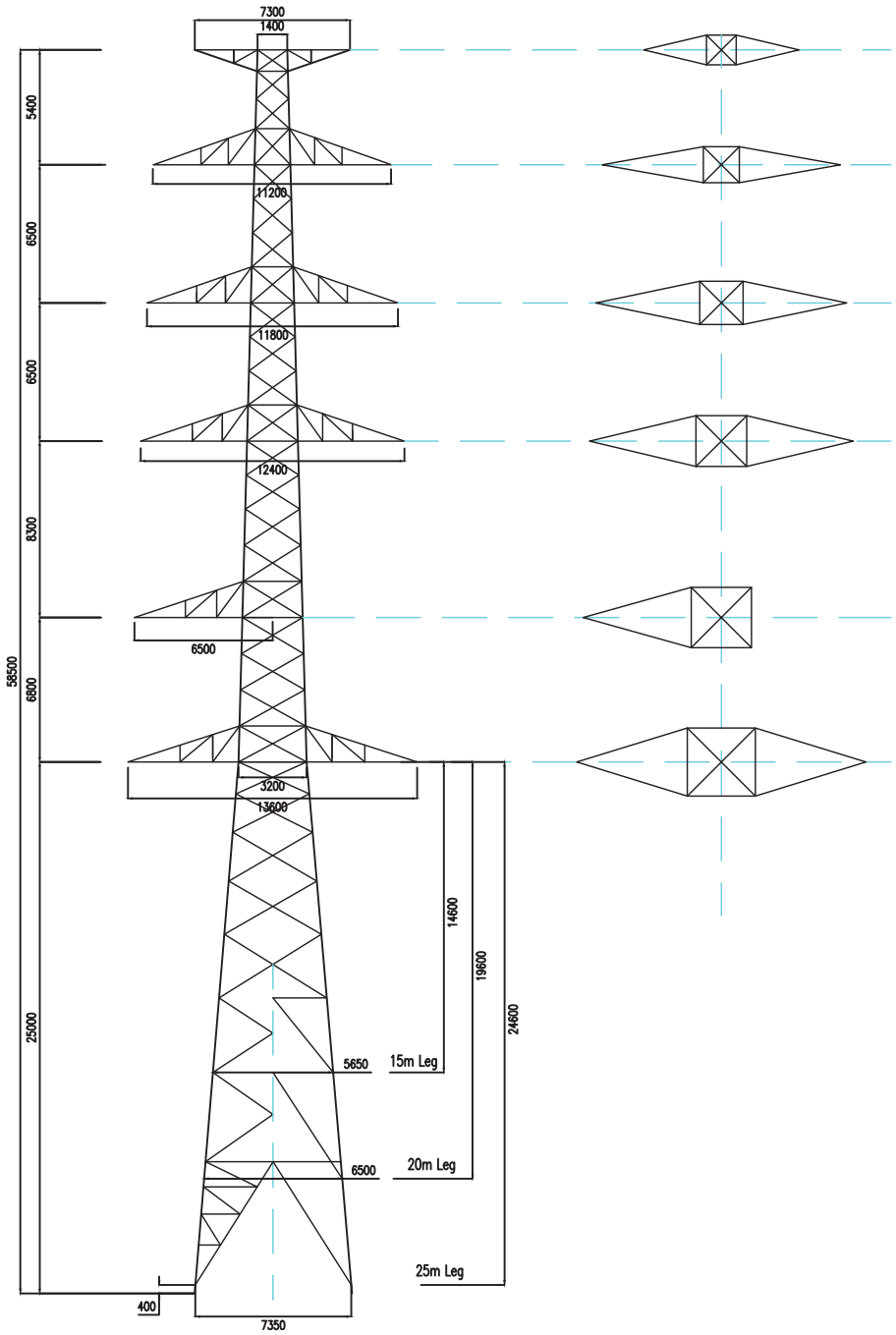
Front : マビボ変電所側

REFERENCE ONLY

タンザニア国キネレジ-ウブンゴ 電力供給強化計画	SCALE
Title 220 kV送電線（3回線） 鉄塔（220-3B）	DWG. No. TL-KU-2

DATE	DESIGNED	CHECKED	APPROVED	REVISION

YACHIYO ENGINEERING CO., LTD.
TOKYO, JAPAN

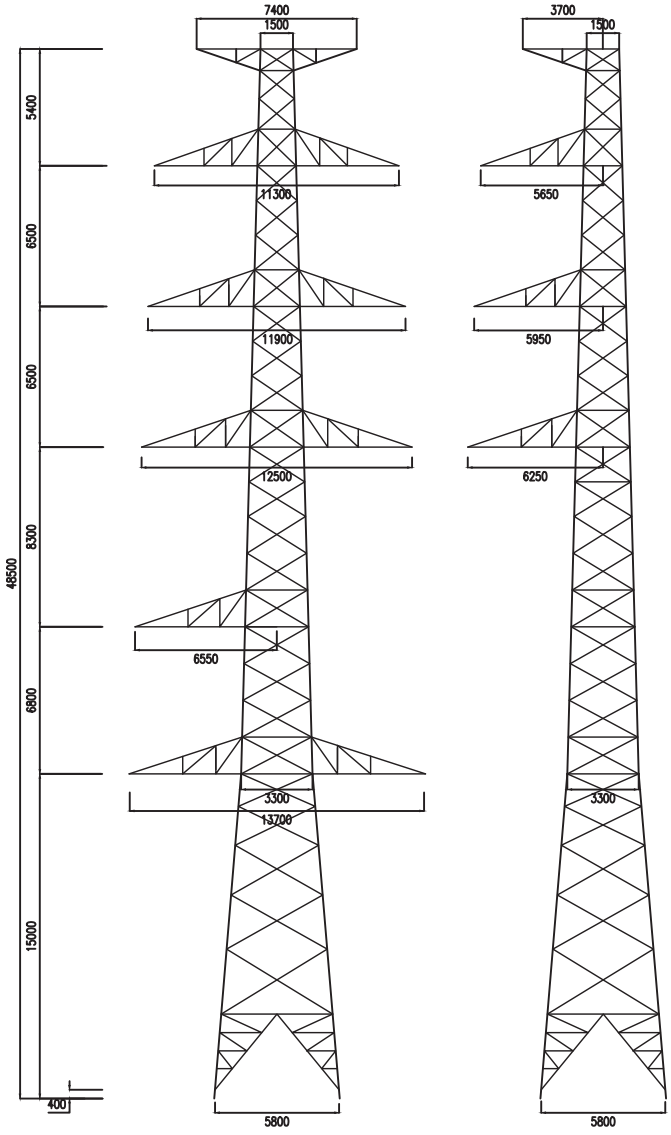


Front : マビボ変電所側

REFERENCE ONLY

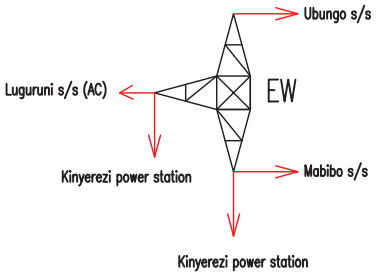
タンザニア国キネレジ-ウブンゴ 電力供給強化計画				SCALE
Title 220 kV送電線（3回線） 鉄塔（220-3C）				DWG. No. TL-KU-3
DATE	DESIGNED	CHECKED	APPROVED	REVISION

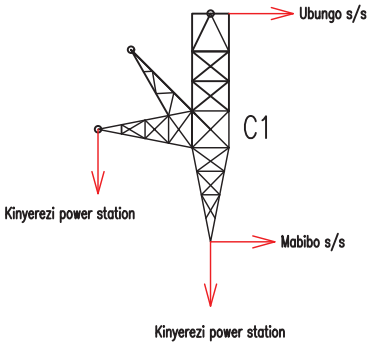
YACHIYO ENGINEERING CO., LTD.
TOKYO, JAPAN

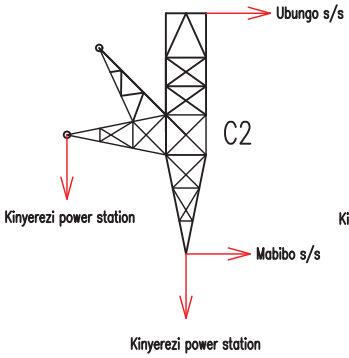


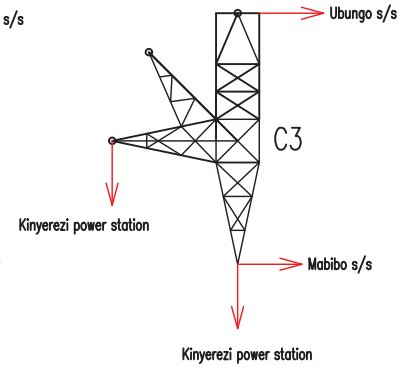
Front：ルグルニ変電所側　　Front： キネレジ発電所側

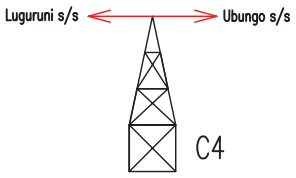
15m Leg

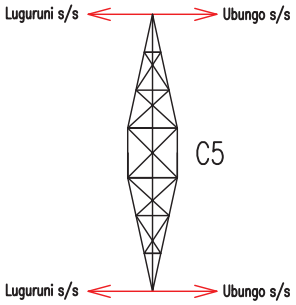








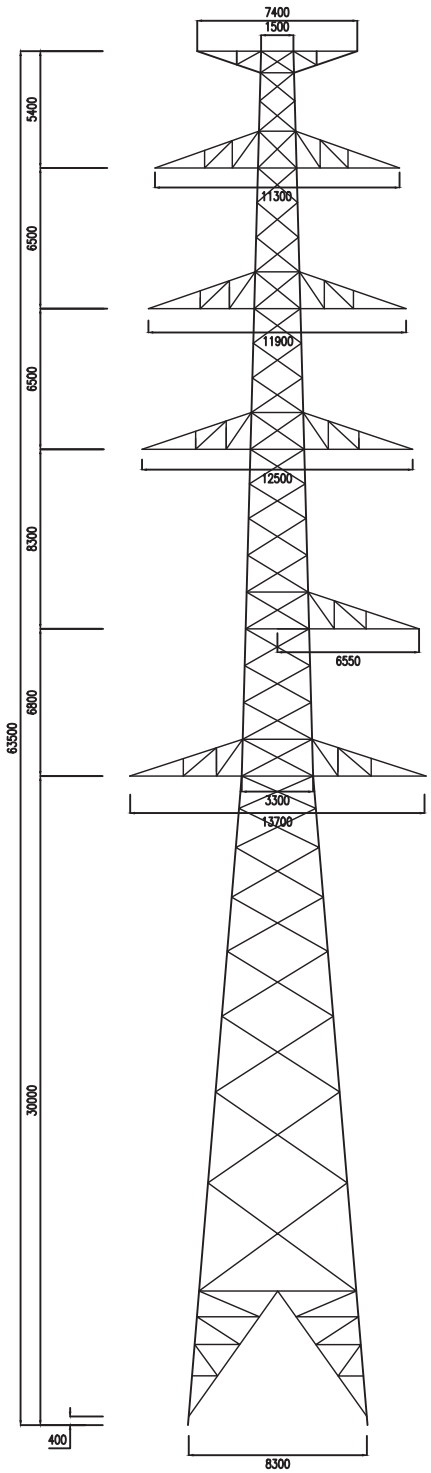




REFERENCE ONLY

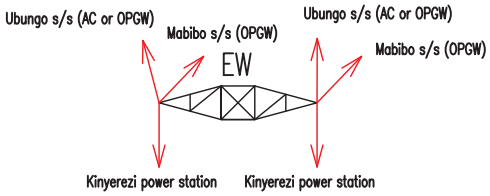
タンザニア国キネレジ-ウブンゴ 電力供給強化計画				SCALE
Title 220 kV送電線（3回線） 鉄塔（220-3D-1）				DWG. No. TL-KU-4
DATE	DESIGNED	CHECKED	APPROVED	REVISION

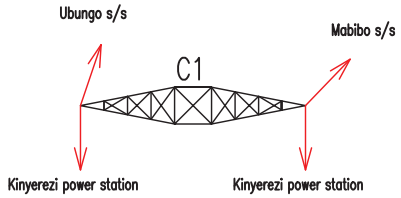
YACHIYO ENGINEERING CO., LTD.
TOKYO, JAPAN

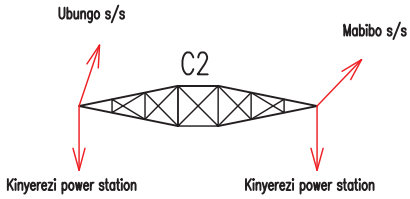


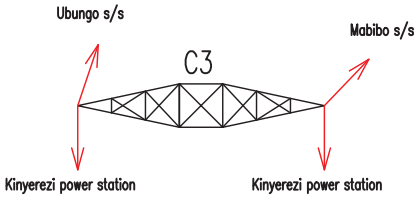
Front：キネレジ発電所側

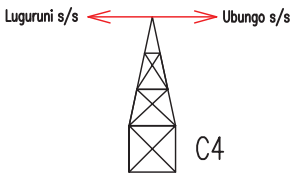
30m Leg

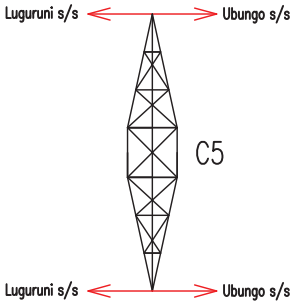








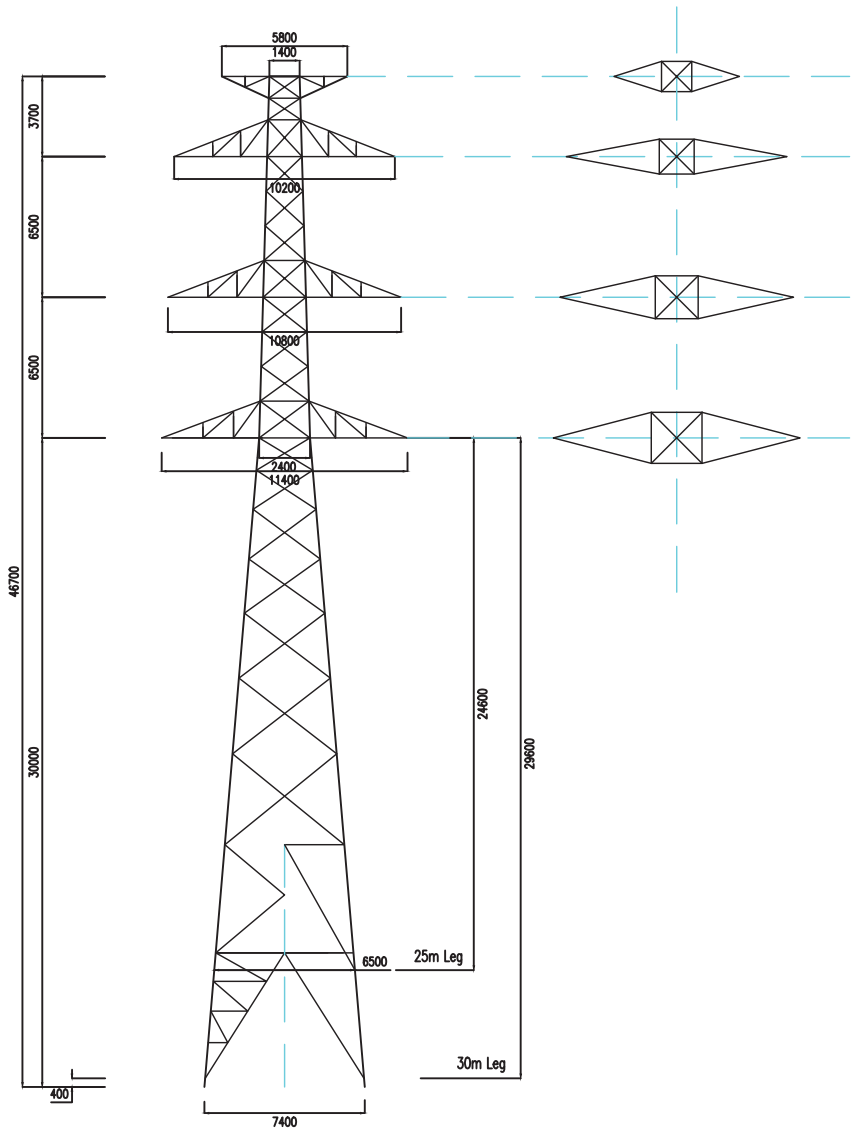




REFERENCE ONLY

タンザニア国キネレジ-ウブンゴ 電力供給強化計画				SCALE
Title 220 kV送電線（3回線） 鉄塔（220-3D-2）				DWG. No. TL-KU-5
DATE	DESIGNED	CHECKED	APPROVED	REVISION

YACHIYO ENGINEERING CO., LTD.
TOKYO, JAPAN

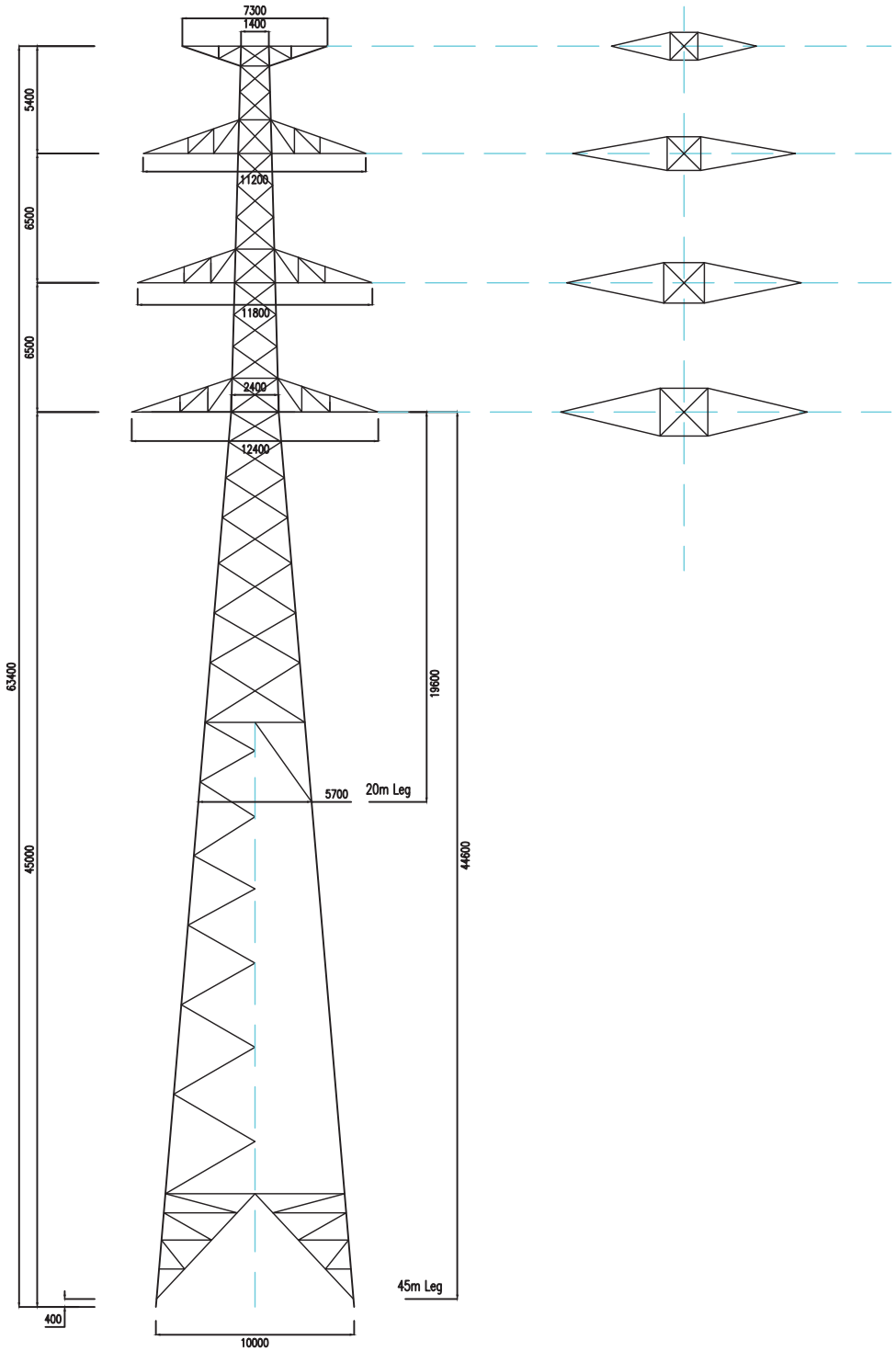


Front : マビボ変電所側

REFERENCE ONLY

タンザニア国キネレジ-ウブンゴ 電力供給強化計画				SCALE
Title 220 kV送電線（2回線） 鉄塔（220-2A）				DWG. No. TL-KU-6
DATE	DESIGNED	CHECKED	APPROVED	REVISION

YACHIYO ENGINEERING CO., LTD.
TOKYO, JAPAN

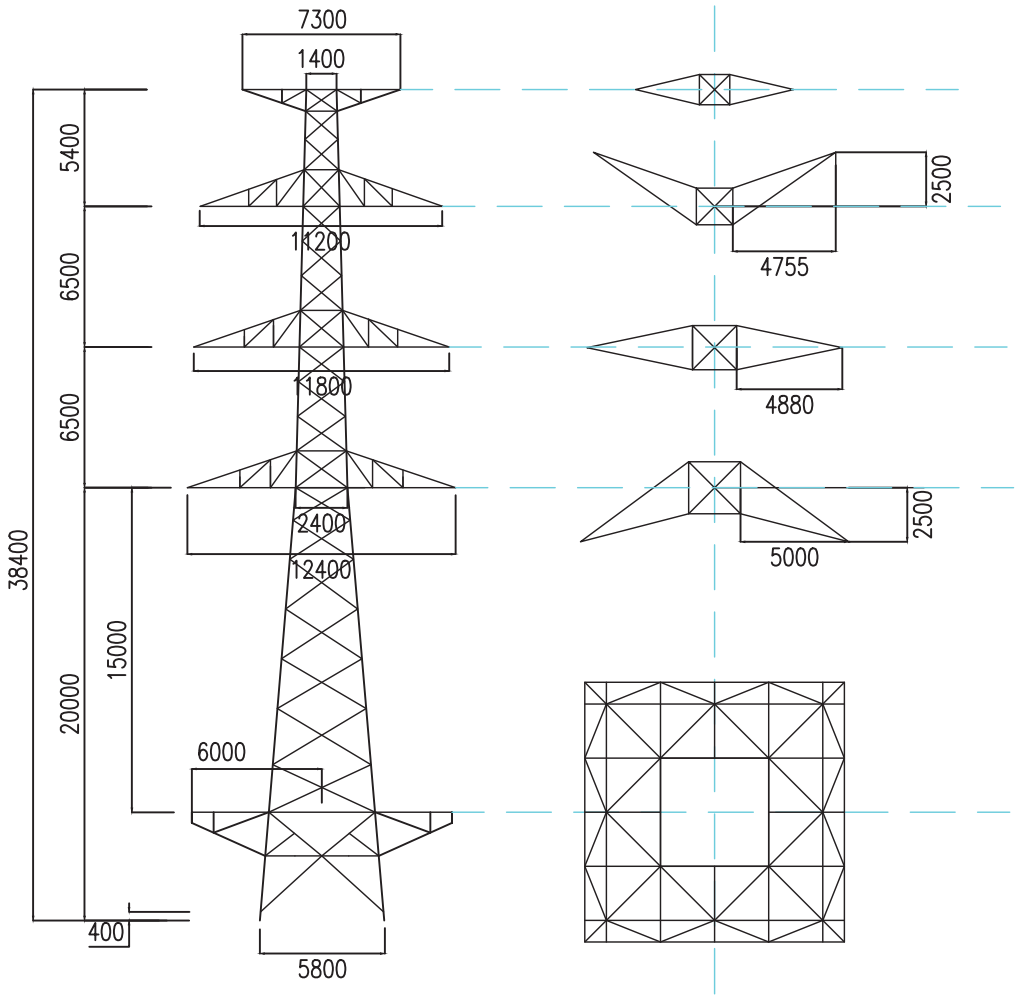


Front : マビボ変電所側

REFERENCE ONLY

タンザニア国キネレジ-ウブンゴ 電力供給強化計画				SCALE
Title 220 kV送電線（2回線） 鉄塔（220-2C）				DWG. No. TL-KU-7
DATE	DESIGNED	CHECKED	APPROVED	REVISION

YACHIYO ENGINEERING CO., LTD.
TOKYO, JAPAN



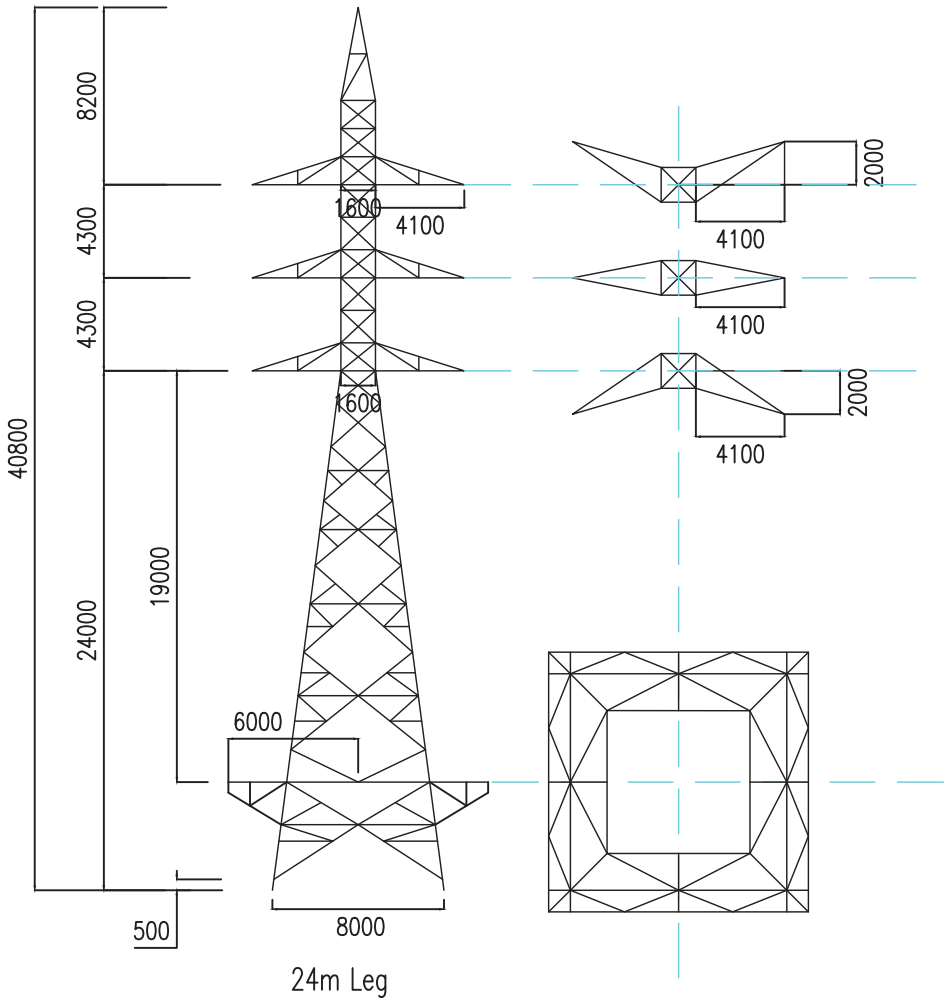
20m Leg

Front : マビボ変電所側

REFERENCE ONLY

タンザニア国キネレジ-ウブンゴ 電力供給強化計画	SCALE
Title 220 kV送電線（2回線） 鉄塔（220-2D）	DWG. No. TL-KU-8
DATE / DESIGNED / CHECKED / APPROVED	REVISION

YACHIYO ENGINEERING CO., LTD.
TOKYO, JAPAN



24m Leg

REFERENCE ONLY

タンザニア国キネレジ-ウブンゴ 電力供給強化計画	SCALE
Title 132 kV送電線（2回線） 鉄塔（132-2D）	DWG. No. TL-KU-9
DATE / DESIGNED / CHECKED / APPROVED	REVISION

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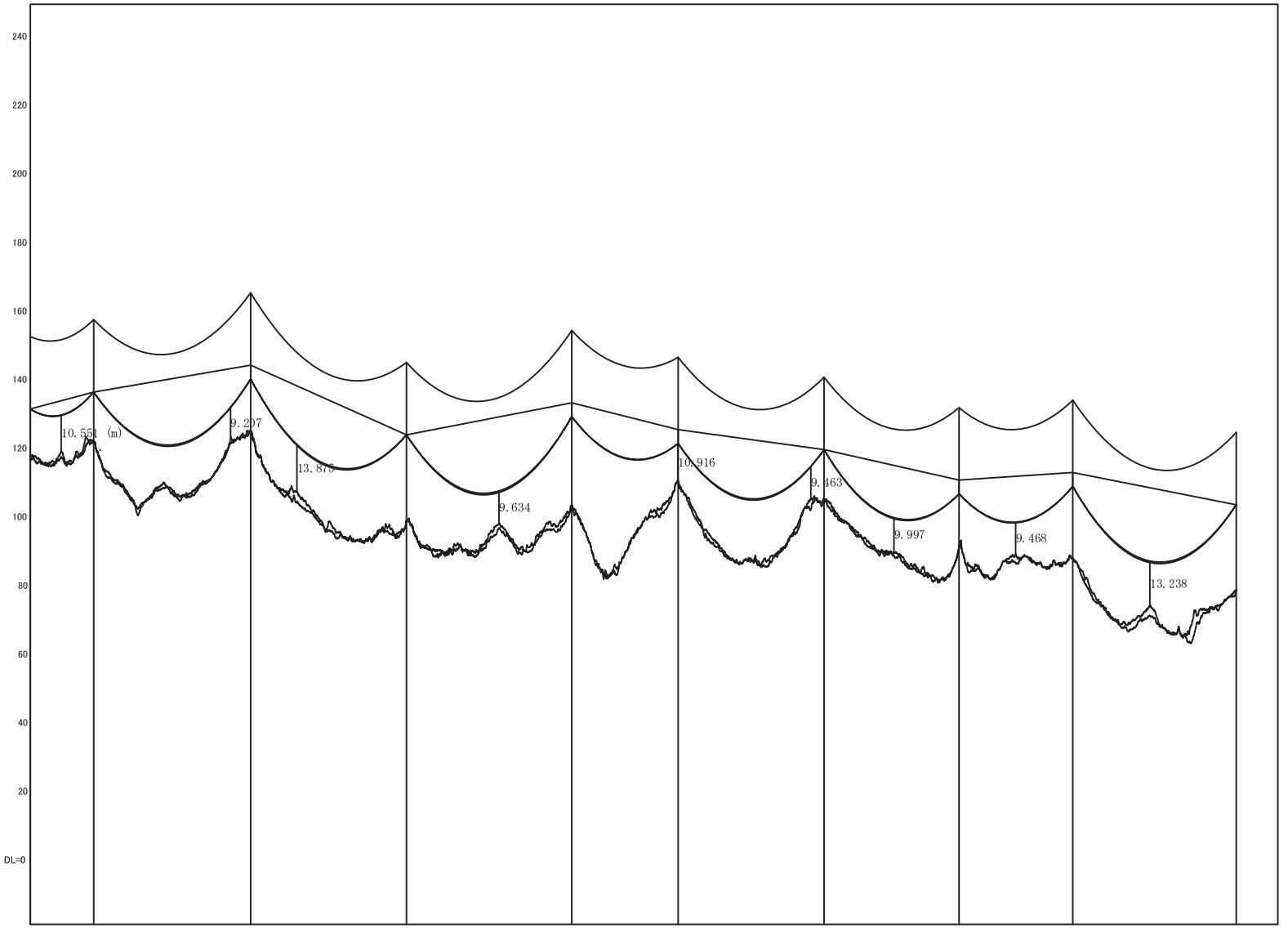
TOKYO, JAPAN



線種 (mm2)	ACSR 603
最大使用張力	5,441kgf

鉄塔番号	1	2	3	4	5	6	7	8	9	10
径間 (m)		184.72	457.75	454.15	482.17	310.26	425.27	393.59	331.73	476.68
水平角度		L0° -25′	L0° -3′	L0° -6′	R0° -29′	L0° -8′	L0° -41′	R0° -53′	L0° -44′	R1° -58′
地盤高低差 (m)		+4.95	+2.83	-25.31	+4.33	+7.18	-5.83	-13.88	-2.79	-9.39
地盤面 (m)	114	122	124	100	103	110	106	91	89	81
型式 (脚長さ(m))	3D-1(15)	3B(15)	3A(20)	3C(25)	3A(30)	3A(15)	3C(15)	3A(20)	3A(25)	3C(25)

REFERENCE ONLY

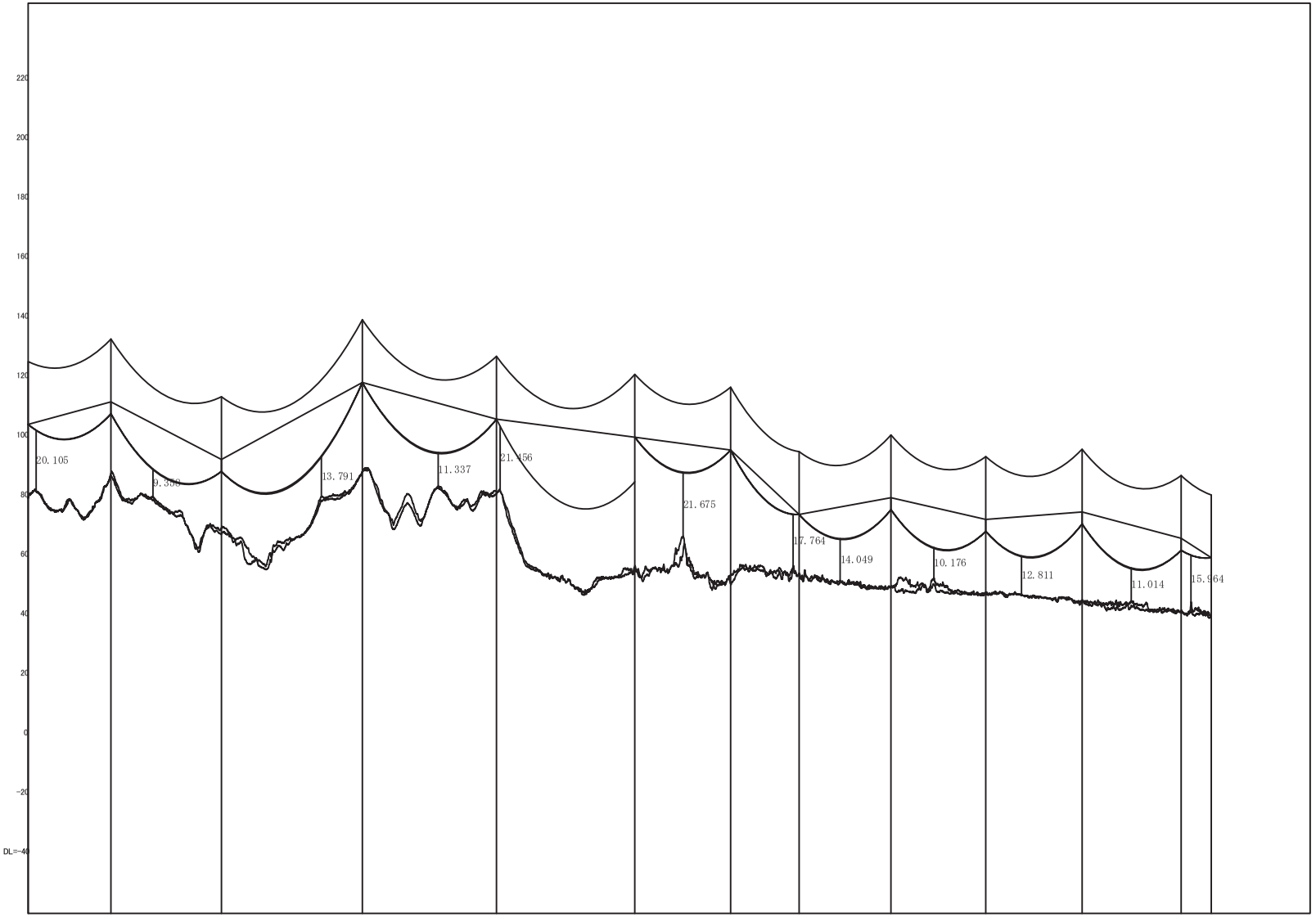
タンザニア国キネレジ-ウブンゴ電力供給強化計画

Title

220 kV送電線縦断図（案）
(1/2)

SCALE	DWG. No.	DATE	DESIGNED	CHECKED	APPROVED	REVISION
	TL-LP-01					

YACHIYO ENGINEERING CO., LTD.
TOKYO, JAPAN



線種　　(mm2)	ACSR 603
最大使用張力	5,441kgf

鉄塔番号	10	11	12	13	14	15	16	17	18	19	20	101.15	21	22
径間 (m)		278.37	371.05	473.51	450.92	464.68	321.66	230.25	308.65	318.83	323.8		332.7	101.1
水平角度	R1° -58′	R0° -46′	R0° -43′	L13° -57′	L1° -5′	R44° -2′	L14° -16′	R17° -44′	R0° -23′	R0° -24′	R0° -30′		R0° -39′	
地盤高低差 (m)	-9.39	+7.55	-19.38	+20.88	-7.31	-26.05	-4.31	+3.35	-4.4	-2.27	-2.62		-3.84	-1.53
地盤面 (m)	81	87	69	89	81	54	50	52	49	47	44		42	40
型式　(脚長さ(m))	3C(25)	3A(25)	3A(25)	3B(30)	3B(25)	3D-2(30/45)	2C(45)	2C(20)	2A(30)	2A(25)	2A(30)		2A(25)	2D(20)

REFERENCE ONLY

タンザニア国キネレジ-ウブンゴ電力供給強化計画

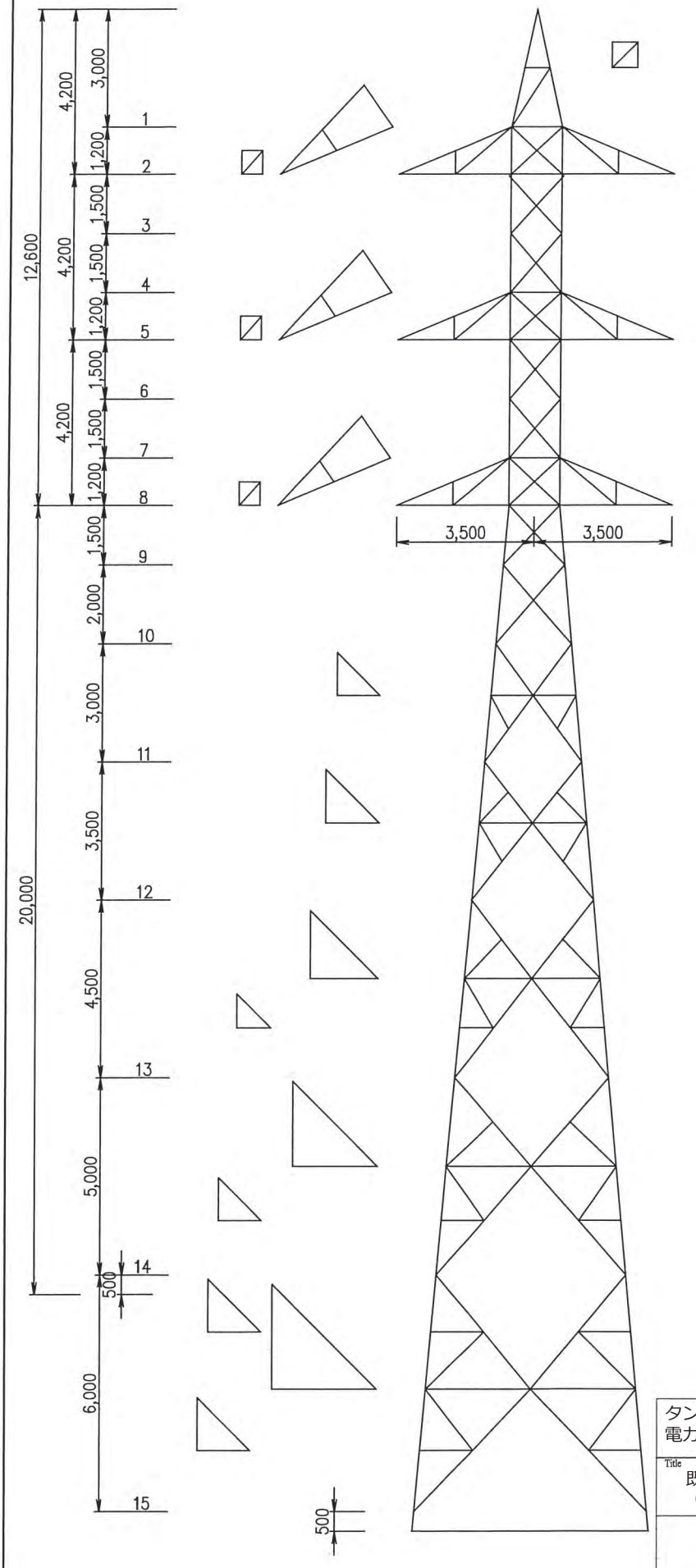
Title

220 kV送電線縦断図（案）
(2/2)

A6-42

SCALE	DWG. No.	DATE	DESIGNED	CHECKED	APPROVED	REVISION
	TL-LP-01					

YACHIYO ENGINEERING CO., LTD.
TOKYO, JAPAN



Reference only

タンザニア国キネレジ-ウブンゴ 電力供給強化計画	SCALE
Title 既設132kV ウブンゴーイララ間鉄塔 （No.19及びNo.20）	DWG. No. TL-UI-01

7. 系統解析に係る基礎データ

系統解析に係る基礎データ

１．発電機データ

Location	Unit	Type	Rated			Rated MVA Base
			(MW)	(kV)	(MVA)	Xd" (pu)
Kinyerezi	KINYE1G	GT	150	18	167	0.2
	KINYE1E	GT	185	20	206	0.2
	KINYE2G	C/C	240	18	267	0.2
Tegeta	TGGEN	GasEngine	45	11	50	0.2
	IPTL	DG	103	11	114	0.2
Ubungo	UGPA	GasEngine	102	11	120	0.2
	UGPB	GT	105	11	117	0.2
	SYMBION	GasEngine	112	11	124	0.2
	SONGAS3A	GT	20	11	22	0.2
	SONGAS3B	GT	20	11	22	0.2
	SONGAS1	GT	42	11	47	0.2
	SONGAS2	GT	120	11	133	0.2

添付資料7 系統解析に係る基礎データ

２．送電線データ

Location		Voltage	Length	Conductor				Impedance(pu)			Rating
From	To	(kV)	(km)	Type	Code	Size(mm^2)	No.	R	X	Y	(MVA)
FZ-III	Ubungo	132	9	ACSR	Hawk	240	1	0.006204	0.020067	0.004422	121
FZ-III	FZ-II	132	8.5		Rail	483		0.002898	0.017617	0.004493	182
Tegeta	Ubungo	132	18.2	ACSR	Wolf	150	1	0.019	0.045	0.00483	74.1
Tegeta	Ubungo	132	18.2	ACSR	Wolf	150	1	0.019	0.045	0.00483	74.1
Ubungo	Mlandizi	132	60	TACSR		240	2	0.062976	0.231	0.025458	352
Ubungo	Kurasini	132	13	ACSR		240	1	0.004432	0.026944	0.006872	182
Ubungo	Makumbusho	132	7	ACSR		240	1	0.006942	0.02695	0.00297	224
Ubungo	Mabibo	132	2	TACSR		240	1	0.002099	0.0077	0.000849	176
Ubungo	Mabibo	132	2	TACSR		240	1	0.002099	0.0077	0.000849	176
Ubungo	Mid1	220	7	ACSR	Bluejay		2	0.000343	0.005228	0.015197	666
Ubungo	Mid8	220	7	ACSR	Bluejay		1	0.0007	0.005445	0.009716	333
Ubungo	Luguruni	220	17.5	ACSR	Bluejay		1	0.00175	0.013612	0.02429	333
Ubungo	Mabibo	220	2	ACSR	Bluejay		2	0.000098	0.001494	0.004342	666
Mid1	Kinyerezi	220	8	ACSR	Bluejay		2	0.000392	0.005975	0.017368	666
Mid2	Kinyerezi	220	8	ACSR	Bluejay		2	0.000392	0.005975	0.017368	666
Mid2	Mabibo	220	10	ACSR	Bluejay		2	0.00049	0.007469	0.02171	666
Mid3	Chalinze	132	4	ACSR	Wolf	150	1	0.004224	0.009054	0.001936	74
Mid3	Mlandizi	132	46	ACSR	Wolf	150	1	0.048576	0.104124	0.022264	74
Chalinze	Morogoro	132	82	ACSR	Wolf	150	1	0.086	0.2	0.03772	74.1
Ilala	Mid7	132	1.3	ACSR		240		0.001289	0.005005	0.000552	125
Ilala	Mabibo	132	5.5	TACSR		240	1	0.005773	0.021175	0.002334	176
Ilala	Mabibo	132	5.5	TACSR		240	1	0.005773	0.021175	0.002334	176
FZ-II	Mid6	132	5.2	ACSR		240	1	0.001773	0.010778	0.002749	182
FZ-II	Kinyerezi	132	2.8	TACSR		240	1	0.002939	0.01078	0.001188	176
Mid4	Mbagala	132	11	ACSR		240	1	0.00375	0.022799	0.005815	182
Mbagala	Mid10	132	10.2	ACSR		240	1	0.003477	0.021141	0.005392	182
Kurasini	Mid9	132	5	ACSR		240	1	0.001705	0.010363	0.002643	182
NCC	Mid7	132	1.8	XLPE				0.000423	0.001116	0.024719	140
Mid5	Luguruni	220	10.5	ACSR	Bluejay		1	0.00105	0.008167	0.014574	333
Kinyerezi	Luguruni	220	13.5	ACSR	Bluejay		1	0.00135	0.0105	0.018738	333
Kinyerezi	Luguruni	220	13.5	ACSR	Bluejay		1	0.00135	0.0105	0.018738	333
Somangila	Mid9	132	15	ACSR		240	1	0.005114	0.031783	0.007756	182
Somangila	Mid10	132	15	ACSR		240	1	0.005114	0.031783	0.007756	182
Luguruni	Morogoro	220	157.5	ACSR	Bluejay		1	0.01575	0.122504	0.21861	333
Luguruni	Morogoro	220	157.5	ACSR	Bluejay		1	0.01575	0.122504	0.21861	333

3．変圧器データ

Location			Rating			%Z
			Voltage(kV)		Power	Rating
	From	To	Prim.	Sec.	(MVA)	MVA Base
FZ-III	FZ-III 132kV	FZ-III 33kV	132	33	117	12.33
	FZ-III 132kV	FZ-III 33kV	132	33	117	12.45
Tegeta	Tegeta 132kV	Tegeta 33kV	132	33	65	12.10
	Tegeta 132kV	Tegeta 33kV	132	33	65	12.00
	TGGEN	Tegeta 132kV	11	132	50	10.00
	IPTL	Tegeta 132kV	11	132	120	10.00
Ubungo	Ubungo 220kV	Ubungo 132kV	220	132	300	10.00
	Ubungo 220kV	Ubungo 132kV	220	132	300	10.00
	Ubungo 132kV	Ubungo 33kV	132	33	120	13.67
	Ubungo 132kV	Ubungo 33kV	132	33	120	13.55
	UPGA	Ubungo 132kV	11	132	120	10.00
	SYMBION	Ubungo 132kV	11	132	150	10.00
	SONGAS1	Ubungo 132kV	11	132	50	10.00
	SONGAS2	Ubungo 132kV	11	132	150	10.00
	UGPB	Ubungo 220kV	11	220	120	12.00
	SONGAS3A	Ubungo 33kV	11	33	25	10.00
	SONGAS3B	Ubungo 33kV	11	33	25	10.00
Chalinze	Chalinze 132kV	Chalinze 33kV	132	33	55	12.21
Ilala	Ilala 132kV	Ilala 33kV	132	33	60	12.60
	Ilala 132kV	Ilala 33kV	132	33	60	12.60
	Ilala 132kV	Ilala 33kV	132	33	60	12.40
	Ilala 132kV	Ilala 33kV	132	33	60	12.35
Mlandizi	Mlandizi 132kV	Mlandizi 33kV	132	33	20	10.00
	Mlandizi 132kV	Mlandizi 33kV	132	33	20	10.00
	Mlandizi 132kV	Mlandizi 33kV	132	33	50	9.65
	Mlandizi 132kV	Mlandizi 33kV	132	33	50	4.74
FZ-II	FZ-II 132kV	FZ-II 33kV	132	33	50	14.20
	FZ-II 132kV	FZ-II 33kV	132	33	50	14.20
Mbagala	Mbagala 132kV	Mbagala 33kV	132	33	65	14.20
	Mbagala 132kV	Mbagala 33kV	132	33	65	14.20
Kurasini	kurasini 132kV	Kurasini 33kV	132	33	50	14.20
	kurasini 132kV	Kurasini 33kV	132	33	50	14.20
NCC	NCC 132kV	NCC 33kV	132	33	50	9.41
	NCC 132kV	NCC 33kV	132	33	50	9.41
Kinyerezi	Kinyerezi 220kV	Kinyerezi132kV	220	132	120	10.00
	Kinyerezi 220kV	Kinyerezi132kV	220	132	120	10.00
	KINYE1G	Kinyerezi 220kV	18	220	200	12.00
	KINYE1E	Kinyerezi 220kV	20	220	250	12.00
	KINYE2G	Kinyerezi 220kV	18	220	300	12.00
Somangila	Somangila 132kV	Somangira 33kV	132	33	50	10.00
	Somangila 132kV	Somangira 33kV	132	33	50	10.00

添付資料7 系統解析に係る基礎データ

Location			Rating			%Z
			Voltage(kV)		Power	Rating
	From	To	Prim.	Sec.	(MVA)	MVA Base
Luguruni	Luguruni 220kV	Luguruni 33kV	220	33	90	20.00
	Luguruni 220kV	Luguruni 33kV	220	33	90	20.00
Makumbusho	Makumbusho 132kV	Makumbusho 33kV	132	33	55	11.60
	Makumbusho 132kV	Makumbusho 33kV	132	33	55	11.60
Mabibo	Mabibo 220kV	Mabibo 132kV	220	132	200	10.00
	Mabibo 220kV	Mabibo 132kV	220	132	200	10.00
Morogoro	Morogoro 220kV	Morogoro 132kV	220	132	90	10.00
	Morogoro 220kV	Morogoro 132kV	220	132	150	10.00
	Morogoro 220kV	Morogoro 132kV	220	132	150	10.00

４．キャパシタデータ

Substation	Voltage (kV)	Bank No.	Rating/Bank (Mvar)	Total rating (Mvar)
Ubungo	33	1	18.3	18.3
Ilala	33	2	18.3	36.6
Makumbusho	33	1	9.3	9.3

8. 変電所及び送電線切替作業・手順（案）

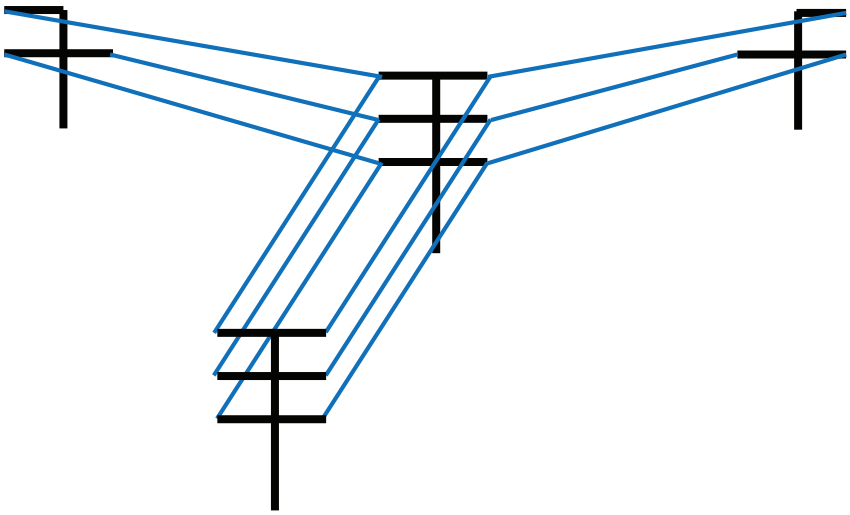
資料－8　変電所及び送電線切替作業・手順（案）

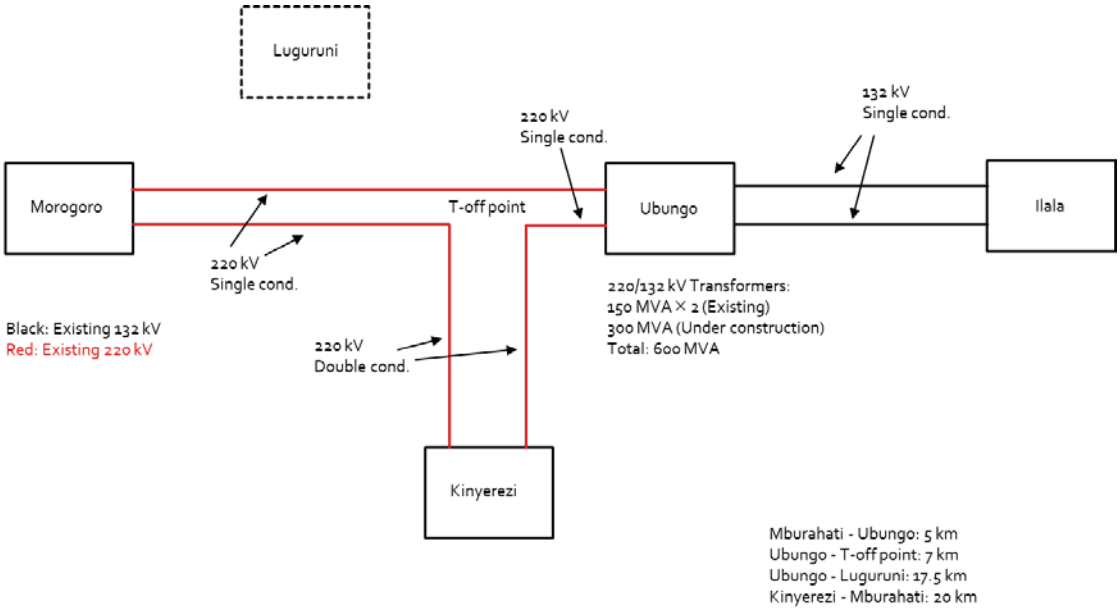
8. 変電所及び送電線切替作業・手順（案）

TL-02 Work Demarcation for Installation of 220 kV T-off tension tower (Draft)

Work Demarcation
for Installation of 220 kV T-off tension tower (Draft)

・Existing tower position

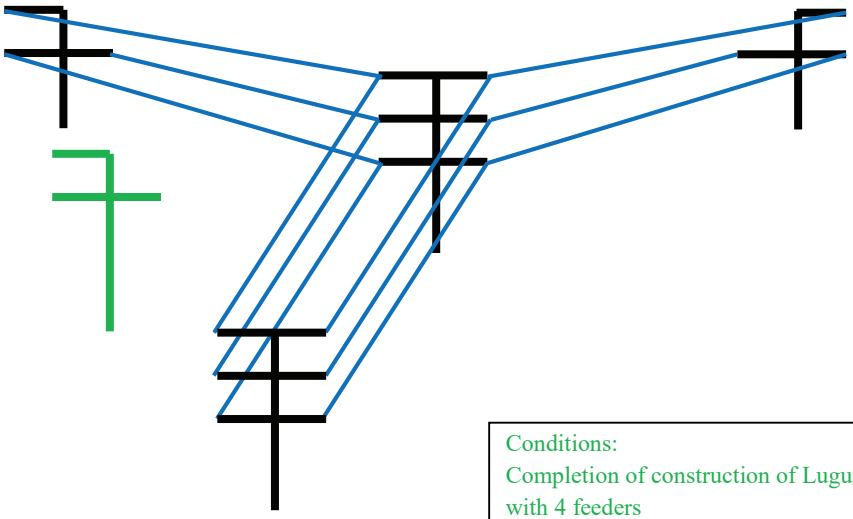




Present configuration in 2019

8. 変電所及び送電線切替作業・手順（案）

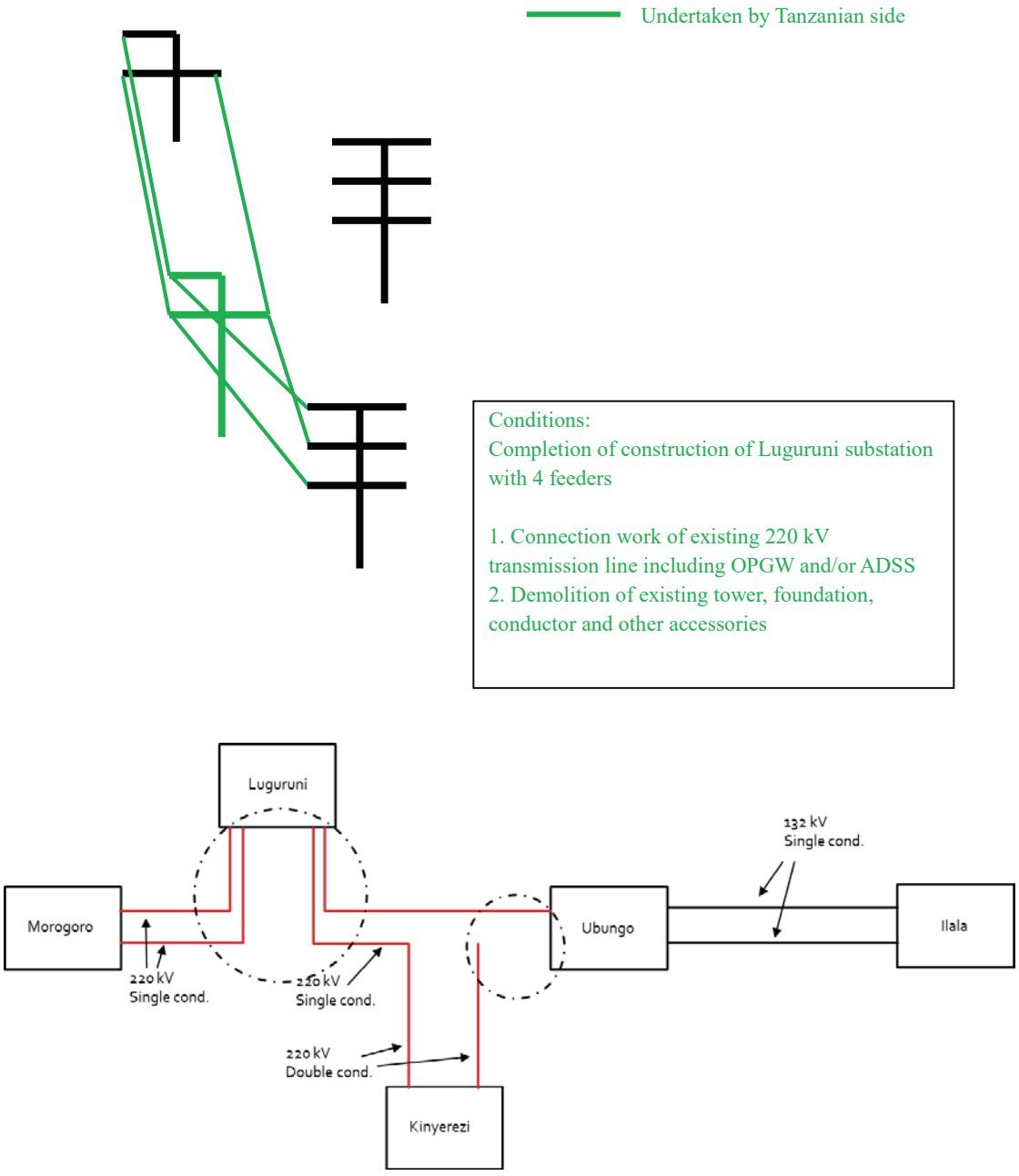
・Step 1



Conditions:
Completion of construction of Luguruni substation with 4 feeders

1. Construction of temporary tower

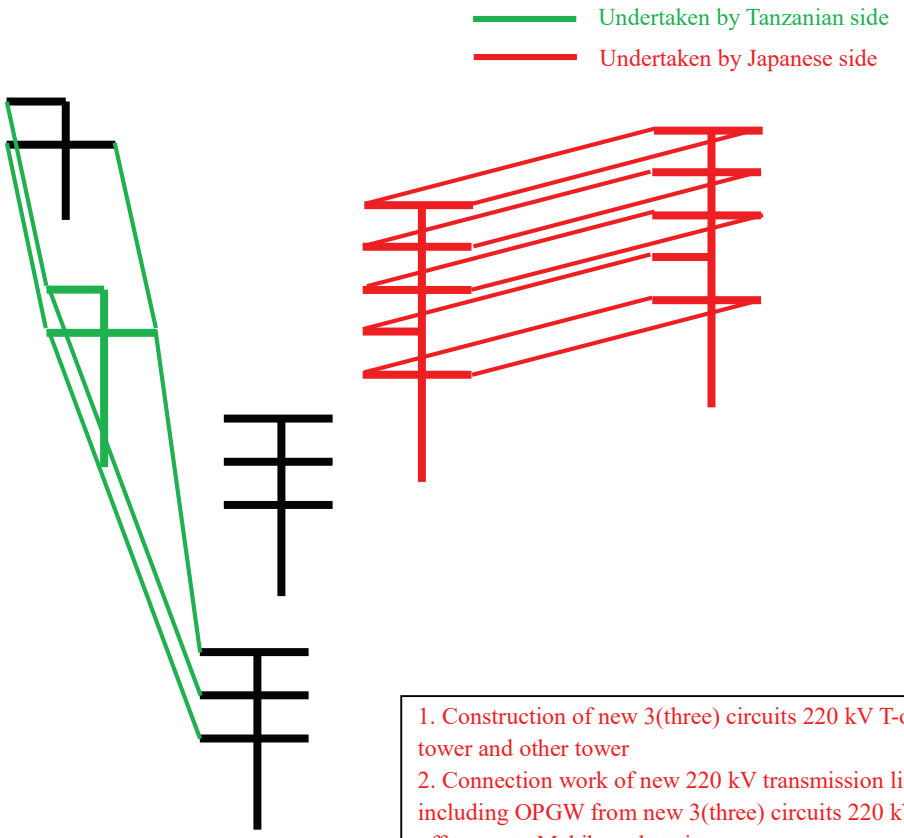
・Step 2



Configuration as of 2020 + α

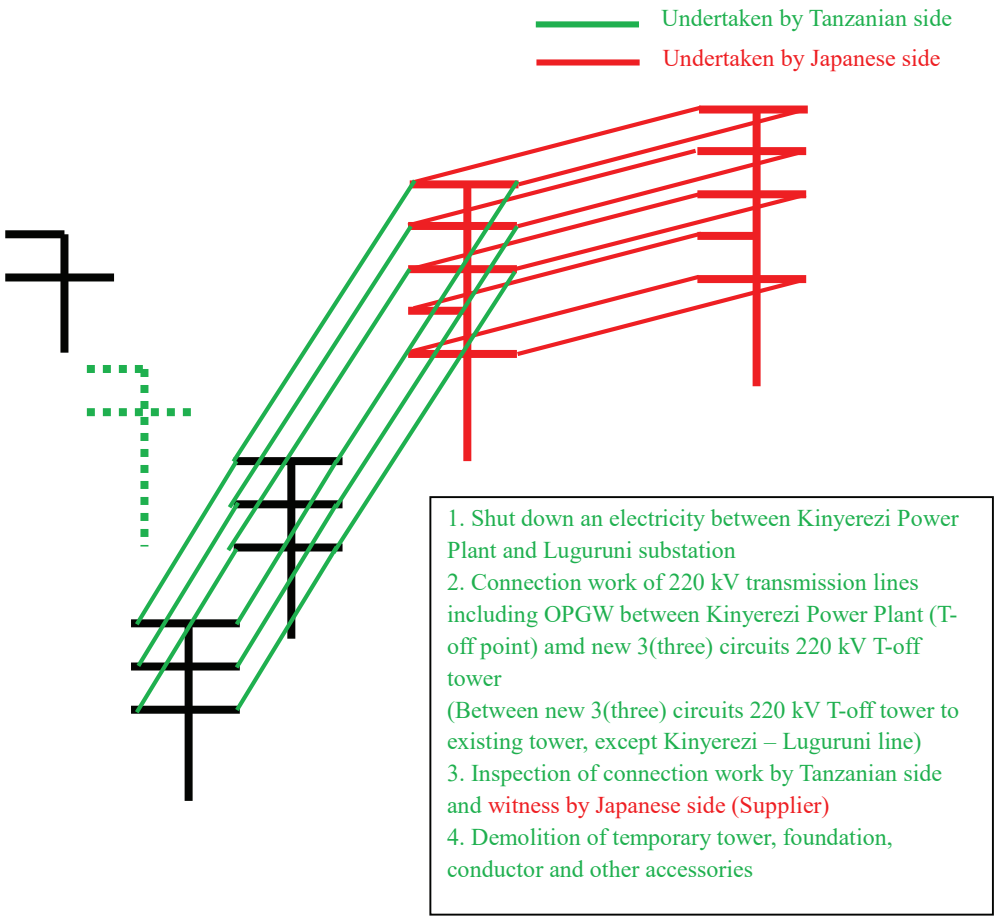
8. 変電所及び送電線切替作業・手順（案）

・Step 3

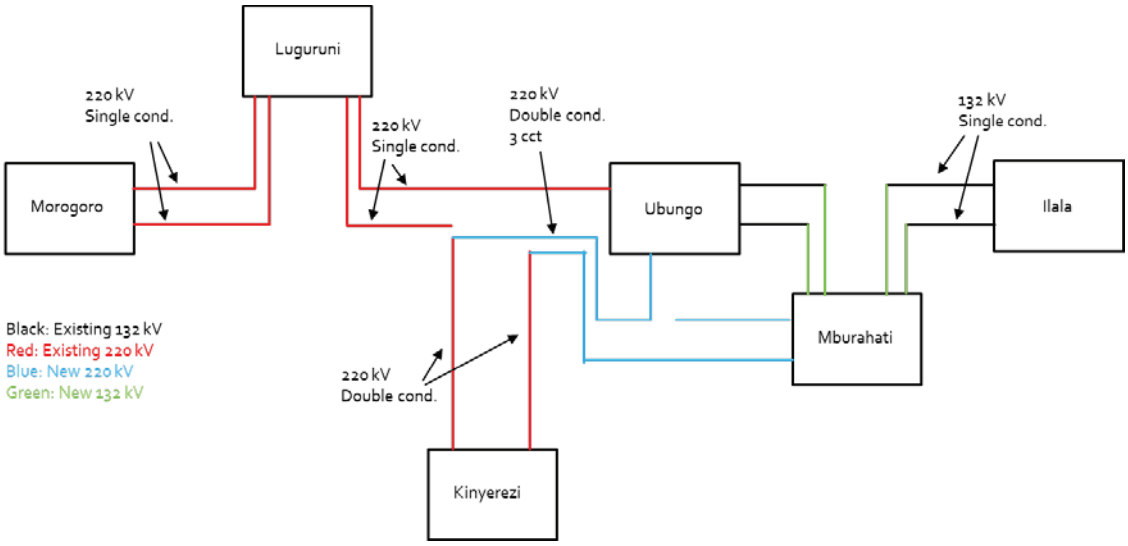


1. Construction of new 3(three) circuits 220 kV T-off tower and other tower
2. Connection work of new 220 kV transmission lines including OPGW from new 3(three) circuits 220 kV T-off tower to Mabibo substation

・Step 4

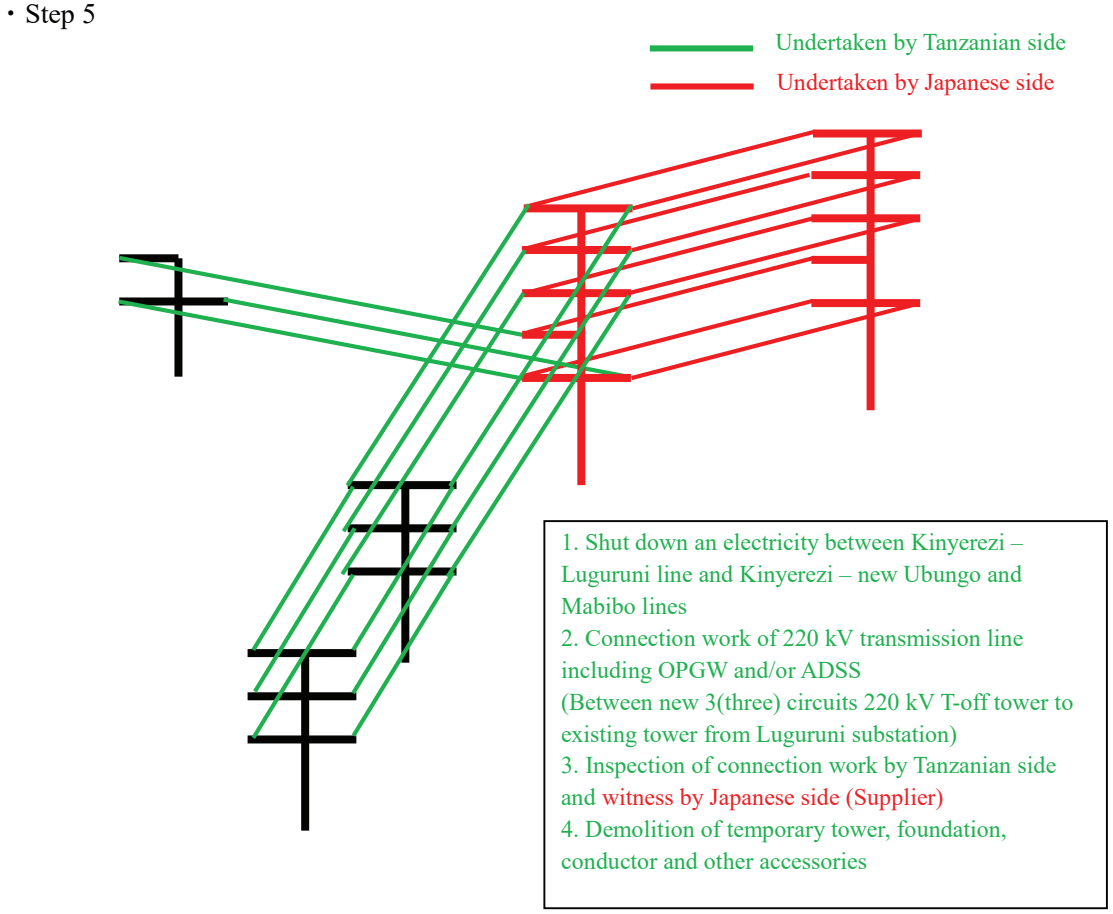


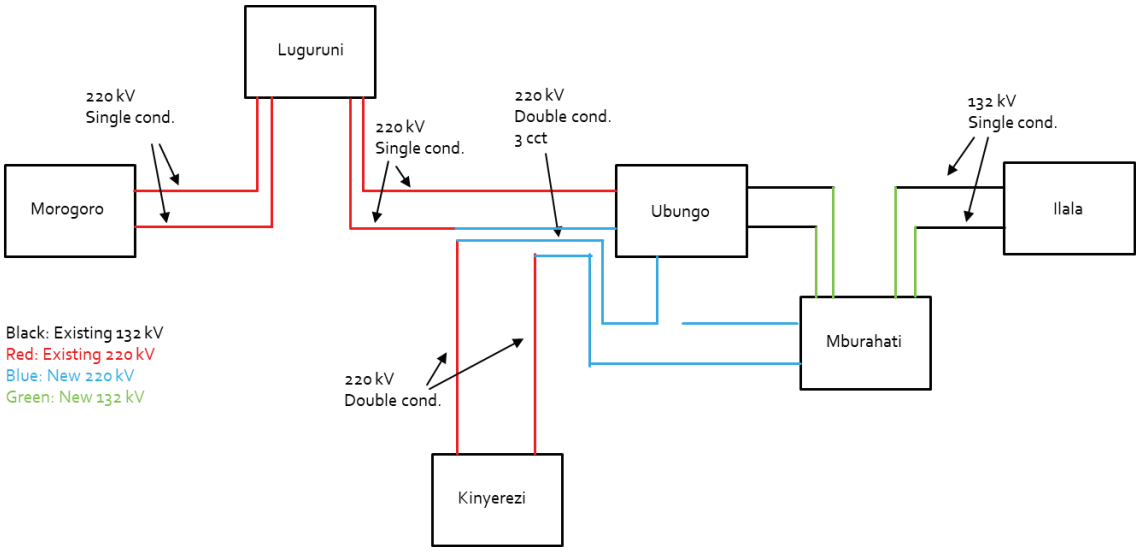
Configuration as of 2025



8. 変電所及び送電線切替作業・手順（案）

・Step 5



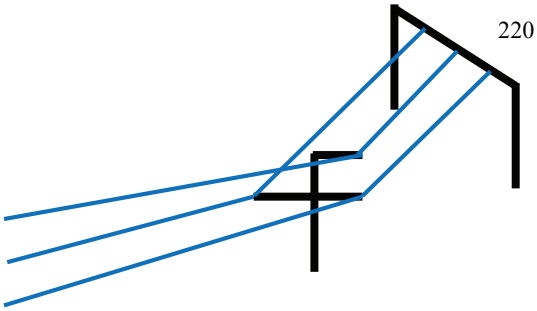


Configuration as of 2025

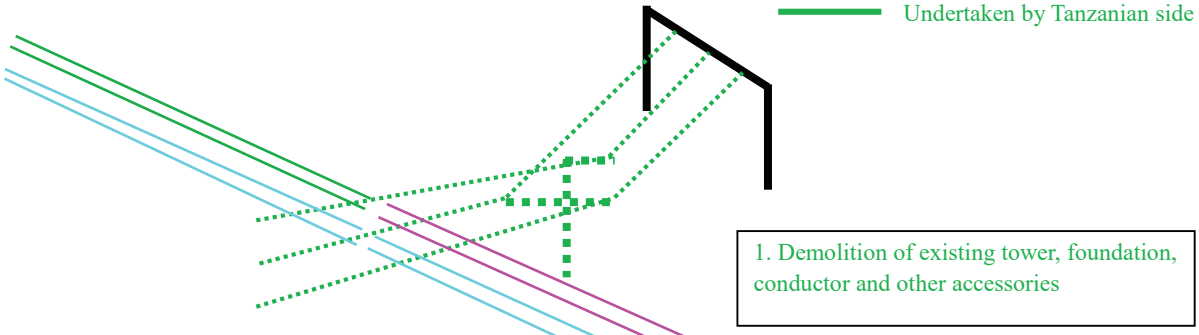
TL-03 Work Demarcation for Installation of 220 kV dead end tower nearby Ubungo substation (Draft)

Work Demarcation for Installation of 220 kV dead end tower nearby Ubungo substation (Draft)

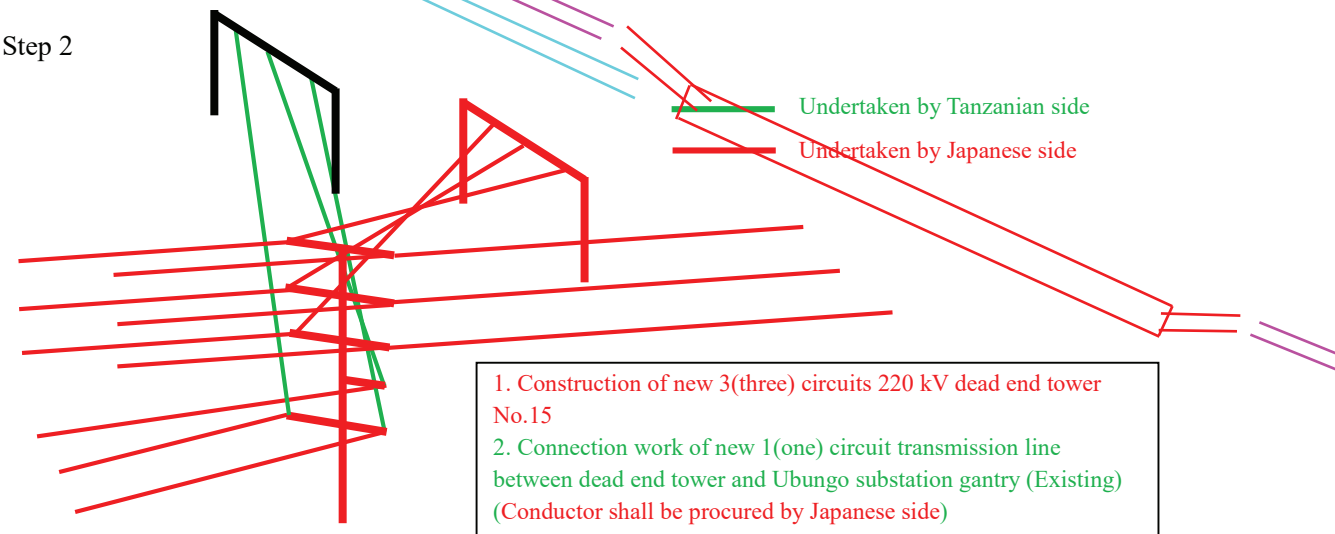
・Existing tower position



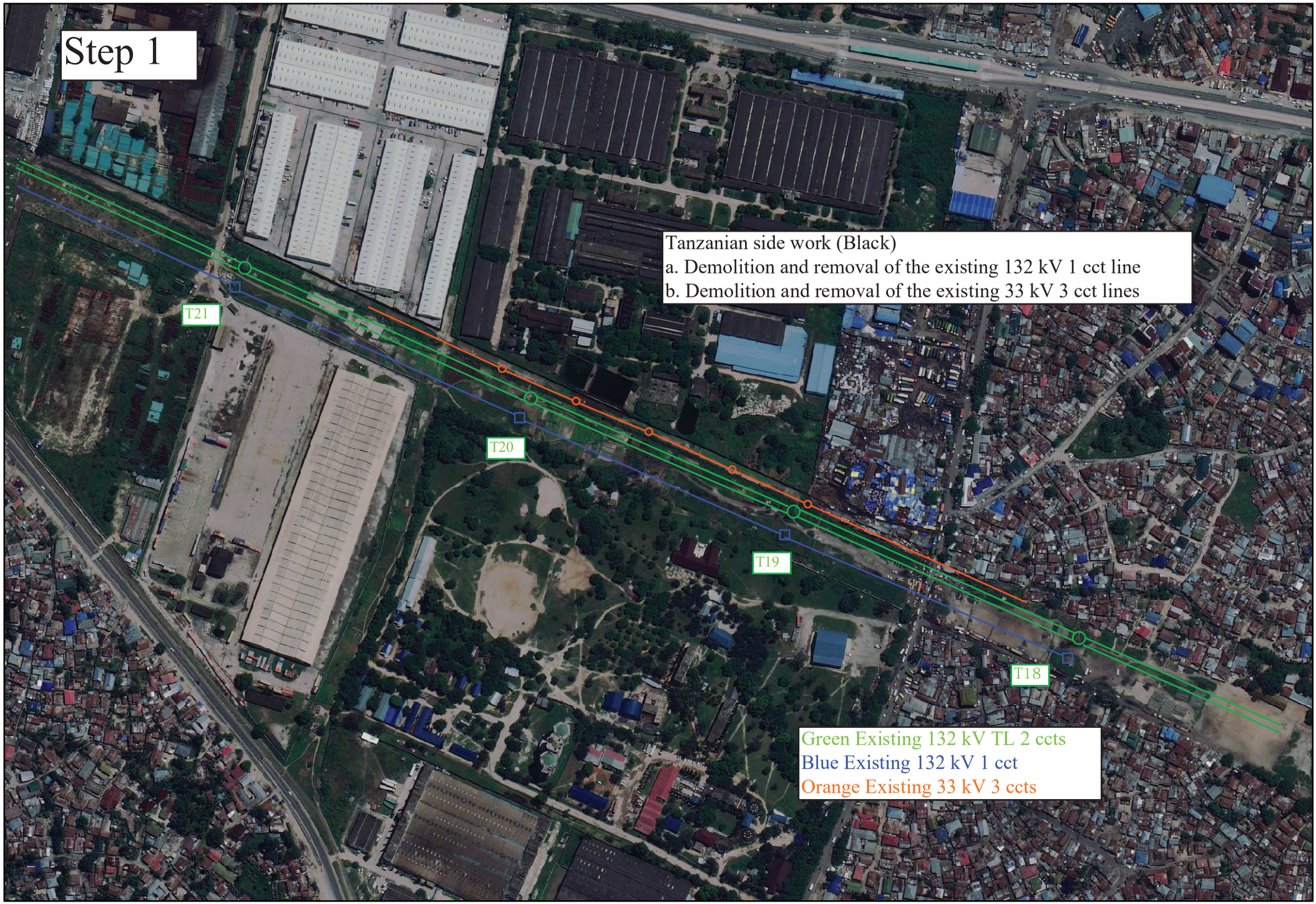
・Step 1



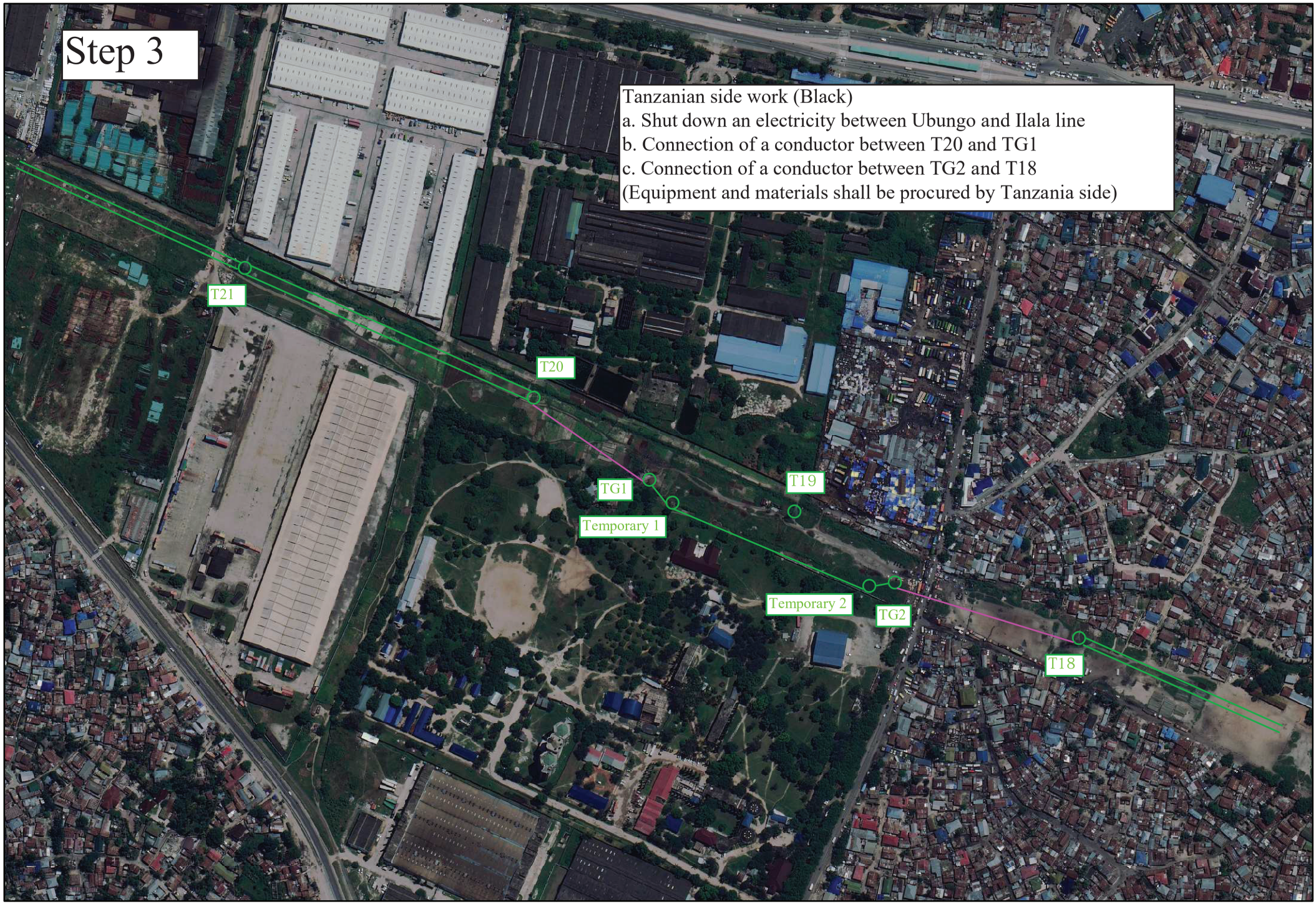
・Step 2




Current conditions
T21
T20
T19
T18
Green 132 kV TL 2 ccts
Blue 132 kV 1 cct
Orange 33 kV 3 ccts

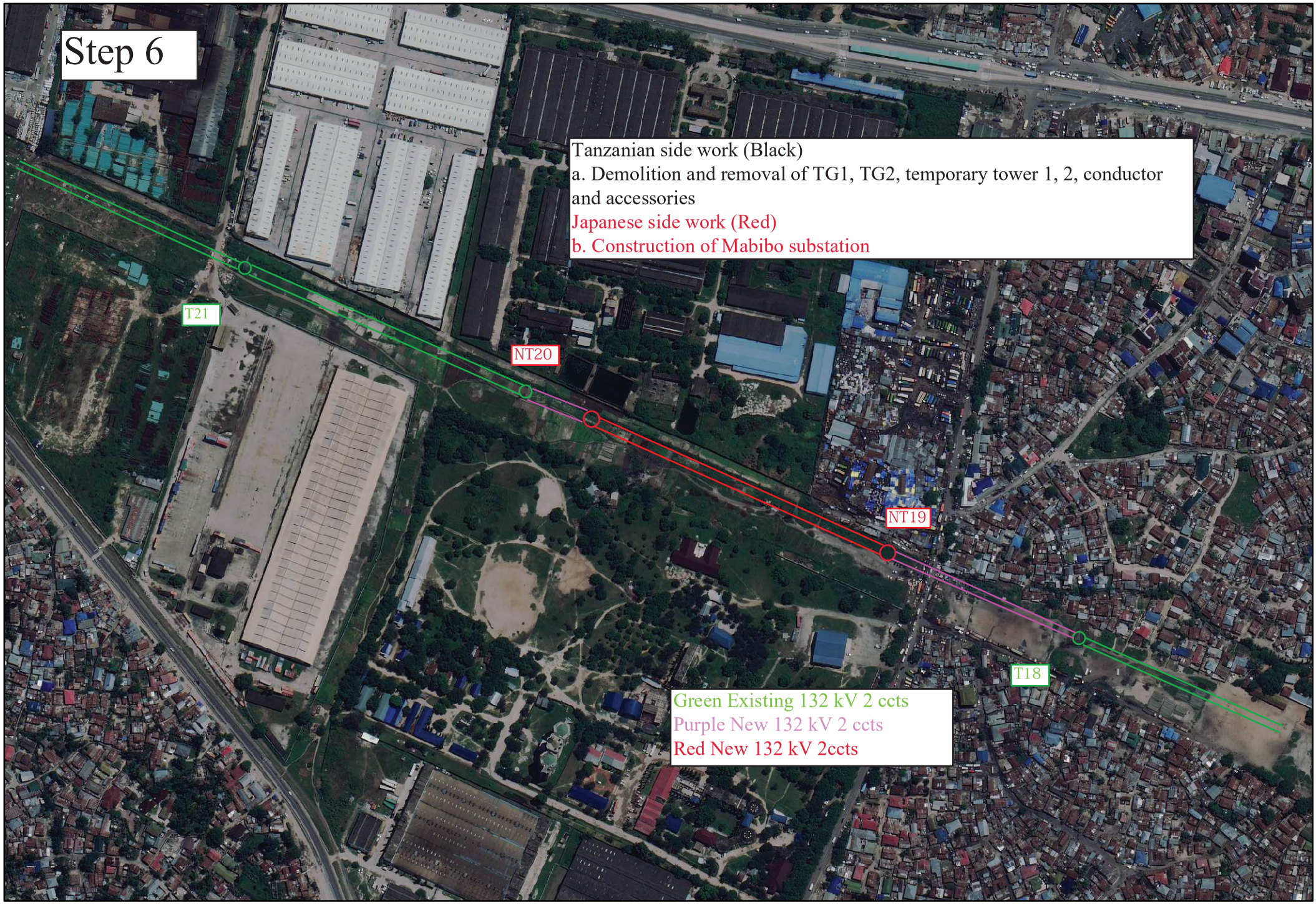

Step 1
Tanzanian side work (Black)
a. Demolition and removal of the existing 132 kV 1 cct line
b. Demolition and removal of the existing 33 kV 3 cct lines
T21
T20
T19
T18
Green Existing 132 kV TL 2 ccts
Blue Existing 132 kV 1 cct
Orange Existing 33 kV 3 ccts


Step 2
Tanzanian side work (Black)
a. Construction of the temporary gantry No. TG1 and TG2 for supporting a conductor from T20 and T18
b. Construction of the temporary 132 kV 1cct (or 2cct) towers temporary 1 and 2 and connection of string
T21
T20
TG1
T19
Temporary 1
TG2
Temporary 2
T18


Step 3
Tanzanian side work (Black)
a. Shut down an electricity between Ubungo and Ilala line
b. Connection of a conductor between T20 and TG1
c. Connection of a conductor between TG2 and T18
(Equipment and materials shall be procured by Tanzania side)
T21
T20
TG1
Temporary 1
T19
Temporary 2
TG2
T18


Step 4
Japanese side work (Red)
a. Demolition and removal of the existing 132 kV tower T19 (including foundation)
b. Construction of 132 kV 2 ccts dead end tower (permanent) NT20 and NT19
c. Connection work of 132 kV temporary conductor (TACSR) between NT20 and NT19
T21
NT20
TG1
Temporary 1
NT19
Temporary 2
TG2
T18


Step 5
Tanzanian side work (Black)
a. Shut down an electricity between Ubungo and Ilala line
b. Connection work of 132 kV conductor between T20 and NT20
c. Connection work of 132 kV conductor between T18 and NT19
(Materials, such as conductor, etc, between T20 and NT20 and between NT19 and T18 shall be procured by Japanese side except insulator and etc. at T20 and T18)
d. Demolition and removal of a conductor between T20 and TG1
e. Demolition and removal of a conductor between T18 and TG2
T21
T20
NT20
TG1
Temporary 1
NT19
Temporary 2
TG2
T18


Step 6
Tanzanian side work (Black)
a. Demolition and removal of TG1, TG2, temporary tower 1, 2, conductor and accessories
Japanese side work (Red)
b. Construction of Mabibo substation
T21
NT20
NT19
T18
Green Existing 132 kV 2 ccts
Purple New 132 kV 2 ccts
Red New 132 kV 2ccts


Step 7
Tanzanian side work
a. Shut down an electricity between Ubungo and Ilala substation
Japanese side work (Red)
b. Removal of 132 kV temporary conductor (TACSR) between NT20 and NT19
c. Connection of 132 kV under ground cable between NT20 and new Mabibo substation
d. Connection of 132 kV under ground cable between NT19 and new Mabibo substation
T21
T20
NT20
NT19
T18
Green Existing 132 kV 2 ccts
Purple New 132 kV 2 ccts
Red New 132 kV 2ccts
Light bule 220 kV 2 ccts

9. NEMC によるスクリーニング結果

9. NEMCによるスクリーニング結果

NEMC Screening Decision

9. NEMCによるスクリーニング結果

NATIONAL ENVIRONMENT MANAGEMENT COUNCIL(NEMC)
BARAZA LA TAIFA LA HIFADHI NA USIMAMIZI WA MAZINGIRA

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35 Regent Street,
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11404 Dar es Salaam
TANZANIA

In reply please quote: **CB. 145/330/165/05**

Date: 27/04/2020

Managing Director,
Tanzania Electric Supply Company Limited (TANESCO),
P.O. Box 9024,
Dar es Salaam.

RE: SCREENING DECISION FOR THE PROPOSED CONSTRUCTION OF 9KM OF 220Kv TRANSMISSION LINE FROM KINYEREZI T-OFF POINT TO THE NEW MABIBO SUBSTATION, DAR ES SALAAM

We acknowledge receipt of your consultant's letter dated 19th March, 2020 attached with the project brief and Environmental Impact Assessment (EIA) Application forms for the above project. The project has been registered and allotted Application Reference Number **(ARN) 10855** We advise you to refer to this ARN as well as our File Reference number **(CB.145/330/165)** whenever you communicate with the Council concerning this project.

According to the first schedule of the Environmental Management Act (EMA) of 2004 and its subsequent Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018, this project falls under Type A projects, which Environmental Impact Assessment (EIA) study is mandatory. As a first step towards this process, you will be required to carry out a Scoping exercise and submit a Scoping report (together with investment cost) and draft Terms of Reference (ToR) to the Council for review and approval before the start of the EIA study.
According to the first schedule of the Environmental Management Act (EMA) of 2004 and its subsequent Environmental Management (Environmental Impact Assessment and Audit Amendment) Regulations, 2018, this project falls under Type A projects, which Environmental Impact Assessment (EIA) study is a mandatory.

Please take note that the Scoping report should conform to the Environmental Management (EIA and Audit) (Amendment) Regulations 2018, particularly Regulations 8(1) and 10(1) regarding the contents of the scoping report and the essence of the scoping exercise

respectively. Also, be reminded to observe directives given under Regulation 10(2) of the Amended Regulations.

For further information or clarification on this matter, please do not hesitate to contact us through Tel. No. +255 767 774 777, Monday – Friday around 8:00am to 4:00pm.

Yours Sincerely,

Glory J. Kombe
For: Director General

Cc: EAST AFRICA RESOURCE GROUP,
P.O. Box 35631,
Dar es Salaam.

All correspondence should be addressed to the Director General

10. EIA レポート(TANESCO→NEMC)

TANZANIA ELECTRIC SUPPLY COMPANY LIMITED

ENVIRONMENTAL IMPACT ASSESSMENT REPROT FOR THE PROPOSED CONSTRUCTION OF 9KM OF 220kV TRANSMISSION LINE FROM KINYEREZI T – OFF POINT TO THE NEW MABIBO SUBSTATION, DAR ES SALAAM

SUBMITTED TO: **NATIONAL ENVIRONMET MANAGEMENT COUNCIL (NEMC)**
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Email: info@earg.co.tz

SUBMISSION DATE: **NOVEMBER 25TH 2021**

DECLARATION

The following experts conducted and prepared this EIA report

S/n	Name	Position	Signature
1	Prof. Hussein Sosovele	Sociologist/ Environment/ Policy Analyst Team Leader	
2	Dr. Florian Silangwa	Socio-economic and Resettlement Expert	
3	Dr. George Sangu	Plant Ecologist	
4	Mr. Alexander Chambi	Land Use	
5	Mr. Anselm Silayo	Natural Resource Management	
6	Bernadina Kelvin	Environmental Engineer	
7	Neema Masawe	Environmental Technologist	
8.	Ombeni Mosha	Environmental Officer – TANESCO	

ACKNOWLEDGEMENT

Tanzania Electric Supply Company Limited (TANESCO) wishes to thank with profound gratitude all the people that contributed to the preparation of this EIA report. In particular, TANESCO would like to thank the local communities residing in Ubungo Municipal Council as well as Ubungo Municipal Council Officials, where the largest part of the assessment and consultations took place. Without the support of these individuals and their institutions, much of the information that is presented in this report would not have been gathered.

The Management also wishes to thank the National Institute of Transport (NIT), Tanzania Port Authority (TPA) and other institutions for their views and contributions to this report. Their views and suggestions form part of this report.

The management of TANESCO is grateful to the Company staff, particularly, **Mr. Ombeni Mosha** for the valuable contributions to the report through field visit, reviews, provision of all necessary information including trends of power supply and demand in Dar es Salaam and the national in general. Their contribution really made this EIA processes a true iterative and participatory one. Some of the issues of concern were raised and discussed during these consultations, which have resulted in the improvement of the project concept in general.

EXECUTIVE SUMMARY

Project Background and Rationale

The Government of Tanzania in collaboration with the Japan International Cooperation Agency (JICA) through Tanzania Electric Supply Company Limited (TANESCO) are in the plan to construct a new 220kV transmission line from Kinyerezi T-off Point to the new 220/132kV substation near Mabibo area. This unique project will involve construction of a new substation and triple circuit towers from Kinyerezi t-off point to Ubungo substation (7km) and double circuit towers from Ubungo substation to Mabibo substation (2km). The proposed transmission line is estimated to cover a distance of 9km. The project will utilize existing wayleave of Morogoro two (MG2) and existing Ubungo Ilala wayleave on the second portion of the line, the new substation will be constructed on the existing wayleave corridor near Mabibo market and National Institute of Transport (NIT). Therefore no new land will be acquired for construction of the transmission line and the substation; rather the existing transmission line will be demolished and replaced with the new one. However, the MG2 wayleave was acquired long time ago since 1960s before EMA came into force; the project has no EIA certificate which is the same to the Ubungo – Ilala wayleave.

The project is expected to utilize the wayleave of 60m that is 30m from both sides of the centerline. The preliminary survey reveals that, there are several ongoing human activities at the project site. It was noted that the area near Ubungo substation has few residential houses and few mobile shops which will be affected during project construction. Although these activities are done illegally since the wayleave is the property of TANESCO but it was found important to seek the best way to deal with them. These includes graveyards near Ubungo Maziwa and in Kimara Mavurunza and small vegetable gardens near Urafiki textile industry and few pedestrian ways.

According to the Environmental Impact Assessment and Audit Regulations of 2005, all energy development projects require a mandatory EIA. It is on this basis that the National Environment Management Council (NEMC) directed TANESCO to carry out a full EIA study after screening the detailed project brief.

Aside from fulfilling the requirements of the Environmental Impact Assessment and Audit Regulations (2005), this EIA is also aimed at meeting requirements set by the Japan International Cooperation Agency (JICA), in particular the JICA Guidelines for environmental and social considerations (JICA Guidelines). Based on these regulations and requirements, the Project will ensure that Implementation of this project may have negative and positive impacts on social, economic and environment within the project area and beyond, hence this S intends to address those impacts.

This executive summary report presents an overview of assessment of the potential environmental and social impacts associated with the proposed New Mabibo substation and transmission line from Kinyerezi T – Off Point to New Mabibo Substation in Tanzania. This report has been prepared for TANESCO and presents the objectives, methodology and outcomes of the EIA study.

Description of the Project Environment

The proposed 220 KV transmission line project will be located in Dar esSalaam particularly in Ubungo municipality. The 9 km transmission line traverses four wards namely of Kimara, Makuburi, Ubungo and Mabibo. The project intends to utilize existing MG2 way leave from Kinyerezi t-off at Mavurunza mtaa in Kimara ward to the existing Ubungo substation about 7km while the remaining 2 km will utilize the 132kV Ubungo - Ilala wayleave to Mabibo near Nation Institute of Transportation.

The project being in urban area, large part of the project area is characterized by secondary vegetation modified from prevous disturbance caused by construction of MG2 transmission line, TPDC Gas pipeline and DAWASA water infrastructure.Similarly, the whole stretch from Mabibo to Kinyerezi T-off point is surrounded by settlement located outside the wayleave with some encroaching the wayleave particularly at Mavurunza mtaa, Kimara baruti mtaa and Kilungule A and B mtaa in Kimara ward. Also way leave encroachment can be seen at Mabibo where NIT boundary wall is more than 5 m within the way leave, Port authority building has its wall encroaching the way leave and NRS godown has some of ts facility within the wayleave. In

addition to those parmanent encroachment, there are temporary business near Ubungo substation on either side of the Ubungo bridge, garages at Ubungo maziwa, vegatable farming near Urafiki textile industry and grave yards at Ubungo maziwa, mavurunza near settlement.

The terrain of the project area is relatively undulating from Kinyerezi t-off point to ubungo substation; and from Ubungo substation to Mabibo substation the terrain is relatively flat. Access within the way leave corridor is poor, the previous aexisting access has been eroded sevrely and damaged by surface run-off and pratically not accessible. However the project site can be accessed via sevaral feeder roads emerging from Dar-Moro main road crossing the way leave at different points.

Stakeholders and their Involvement in the EIA Process

Stakeholder participation was done in accordance to Section 89 of the Environmental Management Act (EMA) No. 20 of 2004 as outlined in Part V of section 17 of the EIA and Audit Regulations (URT, 2005). Subsection (1) stated that, during the EIA process, the developer or proponent shall in consultation with the Council, seek views of any person who is or is likely to be affected by the project/activity; while subsection (2) provides detailed processes and procedures for public/stakeholders participation in the EIA process.

Various stakeholders' were consulted in undertaking this EIA, these includes Tanzania Electric Supply Company Limited officials, Ubungo Municipal Council, National Institute of Transport, Dar Es Salaam Water Supply and Sanitation Authority (DAWASA), Tanzania Petroleum Development Corporation (TPDC), Wards and Mtaa officials as well as local communities. Similarly the EIA team conducted focused group discussions in the affected wards and streets using checklists. In addition household interviews were conducted using structured questionnaires. This technique was used in order to get quantitative information, which could give the general picture of the affected communities or adjacent communities.

Results of Public Consultations

In general, stakeholders had different opinions with regard to the implementation of the proposed 220kV transmission line project. Some of the issues and concerns raised revolve around social and environmental aspects. The issues and concerns raised during the consultations include;

- **Valuation and compensation issues**

The issue of fair and timely compensation was also raised during the consultation. Stakeholders complained that it is taking long time for the compensation to be paid to the affected people after the completion of the valuation process. Stakeholders at Kibo mtaa reported that the valuation of properties in the area was done since 2013 but no compensation has been paid so far. They complained that they have been living in a difficult environment since the valuation has taken place because they are not allowed to do any improvement in their houses as any modification after the valuation will not be considered for compensation. Stakeholders raised concern that in most cases local communities are not well informed of their rights, leave alone the compensation procedure as a result people are denied of their rights.

- **Accident, risks and Hazards**

Accidents and risks may occur to workers during construction phase especially when handling of machinery and equipment. The communities in the project area are very concerned about the safety risks associated with construction of the power transmission line, which will involve high-tension electricity, movement of tracks carrying construction equipment and existence of substations around Mabibo area. The contractor will have to be sensitive of this issue during mobilization and construction and mitigation measures associated with the raised concerns should be implemented.

- **Noise and Dust emission**

Local communities were concerned that development of the project especially during mobilization and construction phases; project activities will generate noise and dust. This may affect the health of the workers and the people in surrounding areas. The communities recommended contractor to dampen the ground during construction in order to avoid or reduce dust emission.

- **Encroachments of TANESCO way leave**

During the field survey, it was revealed that some business and settlement structures were located within the existing way leave of TANESCO in Ubungo and Kimara wards. During discussion with community and local government officials, they admitted that they are utilizing the TANESCO Way leave for various activities illegally and therefore, they expressed their willing to vacate the area before the commencement of the project. Those who are engaged with vehicle maintenance at Ubungo Kisiwani were concerned with the possibility of getting alternative areas for their activities since they are solely relying on these areas for their livelihoods. **Main Significant Impacts**

Main significant positive impacts

- Improvement quality, reliability and efficiency of power supplied
- Increased access to electricity
- Benefits to local communities and Government in terms of revenues generated from various auxiliary activities accelerated by the project
- Employment and income to local people

Main significant negative impacts include

- Loss of land and other properties/assets
- Change in levels of risk of diseases transmission including HIV/ AIDS and STDs.
- Change in level of Waste generation and management issues, including dealing with spoil materials
- Social disturbances from grave removal among others
- Accelerated soil erosion due to increased surface runoff, removal of vegetation cover and storm water
- Increased gaseous pollution
- Change in aesthetics and landscape
- Risks, hazards and accidents

Enhancement measures

- Introduce and implement efficient tax collection systems,
- Improve transparency and accountability in managing government resource.
- Give priority of employment opportunities to the local communities and make it gender equitable.
- Embark on deliberate policy to train local people in skilled jobs so as to benefit from the Power transmission line project.

Mitigation measures

- Continuous awareness programs on HIV/AIDS and providing and equipping of VCT facilities and preventive gears.
- Compensate fairly and promptly the affected communities.
- Undertake proper waste water treatment and disposal of the other waste.
- Undertake regular maintenance services to ensure equipment and vehicles are in line with prescribed emission standards.
- Developer to use appropriate technology that will minimize emission of gaseous and particulate matter.
- Enforce use of polluter pays principal for pollution of river, streams, soils and marine environment
- Raise awareness for foreigners to observe host culture, norms and values.
- Prepare contingency plan for unplanned accidents and hazardous.

Project Alternatives

The 'No Project Alternative'

The '*no project alternative*' is the option of not undertaking the proposed project or any of its alternatives. The "no project alternative" provides the baseline against which the impact of other alternatives should be compared. It is expected that the construction of the 220kV transmission

line from kinyerezi T-Off point to new substation at Mabibo area would have more potentials benefits than negatives thus the 'no project alternative' is over ruled.

Alternative location including connecting the line to the existing Ubungo substation

The proposed project involves construction of new substation at Mabibo area. With the development of new substation the transmission line from Kinyerezi will bypass Ubungo substation and touches some few houses adjacent to Ubungo substation. As an alternative to this approach the proposed line from Kinyereze T-off point should connect to Ubungo substation and avoid affecting households adjacent to Ubungo substation and business taking place adjacent to Ubungo substation.

Mitigation Measures and Mitigation Plan

The Environmental Management Plan (EMP) outlines mitigation and enhancement measures addressing all predicted significant negative and positive impacts as per the EIA report. The EMP requires the developer to implement mitigation and enhancement measures for predicted impacts and demonstrate compliance to environmental standards relevant to Tanzania and/ or as adopted from international organisations. The cost of mitigation/ enhancement to the developer is about **USD 600,000.00** which is relatively low and manageable. A larger proportion of the mitigation/ enhancement cost are due to the government but in this EIA these cost have not been determined or included in the report. The developer will have to set aside a budget to cover the cost of mitigating all impacts as addressed in the EIA document.

Environmental Monitoring Plan

A Monitoring Plan presented as part of this EIA details the parameters and frequencies for measurement or monitoring as well as institutional arrangement for monitoring. Monitoring would entail examination of whether impacts have actually occurred as predicted, the effectiveness of mitigation measures and compliance to national and international standards. Reports from the monitoring process would provide information that might be used for intervention purposes. Various parameters including social, economic and biological/ environmental ones would be considered in the monitoring process. The main responsibility for monitoring is with the developer and it would cost about **TZUSD 80,000.00**.

Other players in monitoring include the government i.e. Ministry of Energy, National Environment Management Council (NEMC), Ubungo Municipal Council and Ministry of Land and Human Settlement Development as identified in the Plan. The cost for the participation of government institutions in monitoring is not included in this EIA.

Cost Benefit Analysis

The cost benefit analysis for this project has not evaluated the project from the point of view of its IRR and NPV because; the financing mechanism for the project is a grant and not a loan, where IRR and NPV would have been important**.** However, the EIA team has worked out the economic analysis for transmission line routes of the Project for Reinforcement of Supply from Kinyerezi Power Station. Prior to the selection of the final route option, six alternatives were comparatively analyzed on the basis of technical, economic and social-environment criteria. Based on the analysis, EIA Team selected the most feasible option, the 9 km route.

The proposed project will positively contribute to revitalize the industries and economic activities in Dar es Salaam and improve stable operation of public welfare facilities and healthcare services as well as the living environment of local residents

Decommissioning

The proposed transmission line system is expected to operate for at least 40 years before it comes to an end. There will be some components of the project that will be closed as soon as their requirement has come to the end. Activities to be done during decommissioning include demolition of power plant and hauling rubble and waste materials from the demolition. Several impacts (negative and positive) are likely to occur as result of the decommissioning.

In implementing decommissioning activities, TANESCO will prepare a detailed decommissioning plan to ensure that environmental and social impacts are minimized in order to comply with environmental legislations and policy requirements. In decommissioning phase, TANESCO will form a team of experts with a representative from the relevant national, regional and local government bodies to monitor the implementation of the decommissioning plan.

Impacts which need to be considered during decommissioning include the following:

- Soil erosion
- Surface run off and surface water quality
- Noise and Vibration
- Waste generation

Mitigation measures which need to be considered includes

- TANESCO/Contractor to schedule decommissioning to be scheduled during dry season.
- TANESCO/Contractor to ensure spoil material from demolished infrastructure is appropriately disposed away from wetlands, water sources.
- TANESCO/Contractor must to all decommissioning activities are confined to core areas.
- TANESCO to ensure there is no unnecessary movement of vehicle.

Conclusions and Recommendations

The proposed Kinyerezi T – Off Point to the New Mabibo Substation transmission line is located in Ubungo Municipality, Dar es Salaam Region. The proposed development of power transmission line from Kinyerezi T – Off Point to the New Mabibo Substation traverses within covering four wards and seven mtaas, namely Kimara (Mavurunza, Kilungule A and Kilungule B), Makuburi (Kibangu), Ubungo (Kibo and Ubungo Kisiwani) and Mabibo where the substation will be located.

The potential impacts have been identified and evaluated for the project on the existing environment (biophysical, social and health). Mitigation measures have been recommended for unavoidable impacts considered significant, to reduce the rating of their identified adverse effects to levels as low as reasonably practicable. Recommendations have also been made to enhance the benefits of the identified positive impacts. A project-specific Environmental and Social Management Plan (ESMP) for assessing the effectiveness of the mitigation measures in controlling identified significant impacts has been recommended.

The EIA has shown that with the implementation of the recommended mitigation measures embodied in the Environmental and Social Management Plan could be executed and

decommissioned with minimal adverse impacts on the environment. The Projects will result in substantial economic benefits to the Dar es Salaam economy and Tanzania in general through increased electric power transmission and distribution. The local communities shall also benefit immensely from the project through employment opportunities and increased financial flows from supply of materials and contracts as well as community development projects that TANESCO will be committed to put in place.

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LIST OF ABBREVIATIONS

ARAP	Abbreviated Resettlement Action Plan
BAT	Best Available Technology
CBD	Convention on Biological Diversity
CICL	Children in conflict with the Law
DAWASA	Dar es Salaam Water and Sanitation Authority
DMRS	Dar es Salaam Marine Reserves System
EARG	East Africa Resource Group
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
EWURA	Energy and Water Utilities Regulatory Authority
HIV/AIDS	Human immunodeficiency virus infection and acquired immune deficiency syndrome
HSE	Health, Safety and Environmental
IFC	International Finance Corporation
IRR	Internal Rate of Return
JICA	Japan International Cooperation Agency
MG2	Morogoro two
NACTE	National Council for Technical Education
NEMC	National Environment Management Council
NESC	National Environmental Standards Compendium
NGOs	Non - Governmental Organization
NIT	National Institute of Transport
NOX	Nitrogen Oxides
NPV	Net Present Value
NSGRP	National Strategy for Growth and Reduction of Poverty
NSGRP	National Strategy for Growth and Reduction of Poverty
OSHA	Occupational Health and Safety

PAPs	Person Affected Projects
PM	Particulate matter
PPE	Person Protective Equipment
PWDs	People With Disabilities
RoW	Right of Way
RWSSP	Rural Water Supply and Sanitation Programme
SGR	Standard Gauge Railway
SIDP	Sustainable Industrial Development Policy
SMEDP	Small and Medium Enterprises Development Policy
SOPs	Standard Operation Procedures
SOX	Sulphur Oxide
STDs	Sexual Transmission Diseases
TACAIDS	Tanzania Commission for AIDS
TANESCO	Tanzania Electric Supply Company Limited
TBS	Tanzania Bureau of standard
TCU	Tanzania Commission for Universities
TL	Transmission Line
TPA	Tanzania Port Authority
TPDC	Tanzania Petroleum Development Corporation
TSCP	Tanzania Strategic Cities Project
TSCP	Tanzania Strategic City Program
URT	United Republic of Tanzania
VCT	Voluntary Counseling and Testing
VPO	Vice President Office
VPO	Vice President Office
WSDP	Water Services Development Plan

1.0 INTRODUCTION

1.1 Background of the Project

The Government of Tanzania in collaboration with the Japan International Cooperation Agency (JICA) through Tanzania Electric Supply Company Limited (TANESCO) are in the plan to construct a new 220kV transmission line from Kinyerezi T-off Point to the new 220/132kV substation near Mabibo area. This unique project will involve construction of a new substation and triple circuit towers from Kinyerezi t-off point to Ubungo substation (7km) and double circuit towers from Ubungo substation to Mabibo substation (2km). The proposed transmission line is estimated to cover a distance of 9km. The project will utilize existing wayleave of Morogoro two (MG2) and existing Ubungo Ilala wayleave on the second portion of the line, the new substation will be constructed on the existing wayleave corridor near Mabibo market and National Institute of Transport (NIT). Therefore no new land will be acquired for construction of the transmission line and the substation; rather the existing transmission line will be demolished and replaced with the new one. However, the MG2 wayleave was acquired long time ago since 1960s before EMA came into force; the project has no EIA certificate which is the same to the Ubungo – Ilala wayleave.

The project is expected to utilize the wayleave of 60m that is 30m from both sides of the centerline. The survey reveals that, there are several ongoing human activities at the project site. It was noted that the area near Ubungo substation has few residential houses and few mobile shops which will be affected during project construction. Although these activities are done illegally since the wayleave is the property of TANESCO but it was found important to seek the best way to deal with them. These includes graveyards near Ubungo Maziwa and in Kimara Mavurunza, few mobile shops and small vegetable gardens near Urafiki textile industry and few pedestrian ways.

Gas pipelines and water pipelines were found using the same corridor however, a detailed report will be prepared by the responsible parties i.e. DAWASCO and TPDC to avoid damage to exsiting infrastructure. Since the line is planned to use existing wayleave the environmental and social impacts are expected to be minimum however, proper attention including stakeholders

engagement is of paramount important. The site can be reached through existing nearby road infrastructures this includes Mandela and Maziwa roads in Ubungo and Kimara Mavurunza road on Kimara side.

1.2 Rationale of the project

According to the Power System Master Plan, 2012, Dar es Salaam is a fast growing city in Tanzania in terms of social and economic development. The fast growth of the city is the result of a number of factors that include expansion of industrial base within the city, population growth, development of new structures including tall buildings and expansion of transport infrastructures such as railway (SGR), road network and expansion of Julius Nyerere International Airport terminal three among others. The combination of economic growth, housing and population growth, income growth and social development have all contributed to the increased demand for electricity consumptions hence requiring reliable supply of power. Ubungo Substation is mostly considered as the mother or primary grid substation to supply power to the other substations around the city. Ubungo Substation is receiving 220kV from MG1 and MG2 lines, and from the following power plants: Kinyerezi (220kV), Ubungo one (220kV), Ubungo two (132kV) and Songas (132kV) and then supplying power to other substation in Dar es Salaam.

The overdependence on Ubungo Substation has sometimes brought difficulties in planning for maintenance services and any technical problems can results to collapse of the national grid. Therefore the construction of new Mabibo 220/132kV substation will reduce overdependence to Ubungo substation and ensure power security to the national grid and to the city of Dar es salaam. By considering the unforeseen impacts to the national grid that might arise from any technical failure on Ubungo Substation the construction of new Transmission line and the substation to evacuate power from Kinyerezi Power plant is of vital importance.

1.3 Scope and objectives of the Environmental Impact assessment

According to the Environmental Impact Assessment and Audit Regulations of 2005, all energy development projects require a mandatory EIA. It is on this basis that the National Environment Management Council (NEMC) directed TANESCO to carry out a full EIA study after screening the detailed project brief.

Aside from fulfilling the requirements of the Environmental Impact Assessment and Audit Regulations (2005), this EIA is also aimed at meeting requirements set by the Japan International Cooperation Agency (JICA), in particular the JICA Guidelines for environmental and social considerations (JICA Guidelines). Based on these regulations and requirements, the Project will ensure that Implementation of this project may have negative and positive impacts on social, economic and environment within the project area and beyond, hence this S intends to address those impacts.

This EIA study seeks to establish biophysical and socio-economic baseline data of the project seating and surrounding environment. The outcome of this assessment will inform TANESCO on likely socio-economic and environmental impacts and recommend mitigation measures, including Environmental and Social Management & Monitoring Plan. Thus, the main objective of the EIA is to provide to decision-makers indications of the likely consequences of the project for their actions or decisions. Therefore, an EIA must: document, in as much detail as possible, the baseline conditions prevailing before the project construction starts; assess and report on the likely magnitude and significance of impacts, both positive and negative; propose mitigation activities to reduce negative impacts and monitoring of important impacts during and after construction; The Environmental Impact Assessment and Audit Regulations of 2005 p.g 5.

This EIA is in response to the proposed transmission line from Kinyerezi T – Off Pointto New Mabibo Substation. The EIA is intended to provide decision-makers with sufficient background information to: (i) assess the socio-economic, biophysical and ecological conditions of the proposed project area; (ii) predict significant impacts that could be caused by the project; (iii)

consider the project alternatives, mitigation measures and prepare environmental management and monitoring plan. The specific objectives of this EIA are:

- To provide detailed description of the proposed power transmission line activities.
- To establish an environmental and socio-economic baseline analysis in the study area and identify issues of significant bio-physical, ecological/biological and socio-economic impacts that is likely to be affected by the proposed project.
- To provide an understanding of the policy, legal and institutional framework for the project including a forum and opportunity for public and stakeholder involvement.
- To identify, predict and evaluate environmental, social and economic impacts associated with the proposed project activities and provide the required alternatives for mitigation.
- To develop appropriate environmental and socio-economic management plan for implementing, monitoring, and reporting of the mitigation measures.

This Environmental Impact assessment (EIA) report presents an assessment of the potential environmental and social impacts associated with the proposed New Mabibo substation and transmission line from Kinyerezi T – Off Point to New Mabibo Substation in Tanzania. This report has been prepared for TANESCO and presents the objectives, methodology and outcomes of the EIA study.

1.4. Approach and Methodology in the EIA Study

The following approaches and methods were used in carrying out the scoping exercise

1.4.1 Approach for Environmental Issues

Data on environmental issues were obtained through literature review and assessment of existing environmental baseline (e.g. vegetation, characteristics of land, geomorphology, water resources and water quality, existing waste practices. To complement the review of available information, field visits in project area from Kinyerezi T-off point to Mabibo substation where the project will be located was made. Site visit was undertaken to assess project location and layout in relation to the proposed development activities; assess the physical characteristics of the project area including the geography, water, vegetation, economic activities, human population settlement and distribution in order to gauge the kind of issues and impacts that are likely to be due to the

implementation of this project. In all the areas various issues related to the proposed development were identified.

1.4.2 Approach for the Assessment of Land Use Issues

A preliminary understanding of the current use of the land in the proposed project area was collected through field observation and discussion with local communities occupying and using the areas. The field observation and discussions focused on the main current uses of the land; the significance attached to their lands; the possible impact of disturbance to economic activities and wildlife during implementation.

1.4.3 Approaches for Socio-economic Issues

Literature review, public consultations and extensive stakeholder involvement constituted the main approach for collecting socio-economic data and issues. On the basis of this approach, existing socio-economic baseline along the transmission line such as local population indicators such as demographics characteristics, employment, economic activities, income levels, land use, NGO's, social organizations, education, health and development programs were undertaken. In order to collect socio-economic baseline information, the following methods and tools were used:

- ***Literature Review***

This method was applied in order to have secondary data about the proposed project. For instance, the consultant had to review feasibility study report, EIA for Rehabilitation of Substations and Construction of new Lines and Substations in Dar es salaam, December 2013 and the reviewing of the relevant legislations such as national policies, laws and regulations governing the power transmission project in Tanzania including the new (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018. Similarly information and other types of data describing the project area were reviewed.

- ***Household Survey***

In order to understand the socio-economic condition of communities around the proposed development, Ubungo Municipal socio-economic profiles was reviewed and supplemented by a household survey. In conducting a detailed household's survey, the following tools were used:

- **Household questionnaire:** A household questionnaire was prepared and used for collecting basic information from all possible affected people. In addition, the questionnaire collected

household demographic information, type of residential houses, level education, economic activities, and average household's income and land related issues from the household's heads along the proposed development. Household's survey was conducted in three streets in Ubungo ward, Mabibo ward and Makuburi ward. The survey covered socio-economic characteristics of the likely affected person and the data will be used for the preparation of Abbreviated Resettlement Action Plan for the project. The targeted audience for household questionnaire was all local community house and business activities within the way leave corridor likely to be affected by the project was conducted.

- **Checklist:** A checklist was prepared and used for collecting qualitative data on social services that are obtained in the ward and streets (mtaa) falling within the way leave corridor, main economic activities, land use, and views regarding the proposed transmission line development in the area.
- ***Meetings and Stakeholders consultations***

Consultations: Stakeholder consultations were conducted at municipal level, wards level and Mtaa /street likely to be traversed by the proposed transmission line. Issues discussed were component of the project, areas traversed by the project, dimension of the way leave required and need for local community to be informed of the proposed project and possibly participate during construction as labor force. Also consultation meeting were used as platform to provide general information about the project and receiving their concerning about the project.

Site visit

To complement the review of available information, a field visit to the project area was carry out to assess project location and layout in relation to the proposed development activities to gauge the impacts that are likely to be of interest in the EIA process. Field visit was carried out by visiting the project site from Kinyerezi t-off point at Mavurunza mtaa in Kimara ward to Mabibo substation located at Mabibo area. Assessment of biophysical environment, available infrastructures within the corridor, settlement, vegetation, streams and rivers in relation to the proposed construction activities were done.

This approach helped the team to analyze natural environment of the project area and solicit information on the socio-economic aspects at the affected environment in the project area.

2.0 DESCRIPTION OF THE PROJECT COMPONENTS

2.1 Project Location

The proposed 220 KV transmission line project will be located in Dar esSalaam particularly in Ubungo municipality. The 9 km transmission line traverses four wards namely of Kimara, Makuburi, Ubungo and Mabibo. The new 220kV transmission line from Kinyerezi T-off Point to the new 220/132kV substation near Mabibo area is presented in figure (1). The project intends to utilize existing MG - 2 corridor from Kinyerezi T-off point at Mavurunza mtaa in Kimara ward to the existing Ubungo substation about 7km, while the remaining 2km will utilize the 132kV Ubungo - Ilala wayleave to Mabibo near the National Institute of Transportation (NIT). The project traverses the four wards and eight mtaas in blackets, namely, Kimara (Mavurunza, Kilungule, A, Kilungule B and Kimara Baruti), Makuburi (Kibangu), Ubungo (Kibo and Ubungo Kisiwani) and Mabibo (Mabibo).

2.2 Description of the Project Area

The project being in urban area, large part of the project area is characterized by secondary vegetation modified from prevous disturbance caused by construction of MG2 transmission line, TPDC Gas pipeline and DAWASA water infrastructure.Similarly, the whole stretch from Mabibo to Kinyerezi T-off point is surrounded by settlement located outside the wayleave with some encroaching the wayleave particularly at Mavurunza mtaa, Kimara baruti mtaa and Kilungule A and B mtaa in Kimara ward. Also way leave encroachment can be seen at Mabibo where NIT boundary wall is more than 5 m within the way leave, Port authority building has its wall encroaching the way leave and NRS godown has some of ts facility within the wayleave. In addition to those parmanent encroachment, there are temporary business near Ubungo substation on either side of the Ubungo bridge, garages at Ubungo maziwa, vegatable farming near Urafiki textile industry and grave yards at Ubungo Maziwa, mavurunza near settlements.

The terrain of the project area is relatively undulating from Kinyerezi t-off point to ubungo substation; and from Ubungo substation to Mabibo substation the terrain is relatively flat. Access within the way leave corridor is poor, the previous existing access roads have been eroded severely and damaged by surface run-off and pratically not accessible. However the project site

can be accessed via sevaral feeder roads emerging from Dar-Moro main road crossing the way leave at different points.

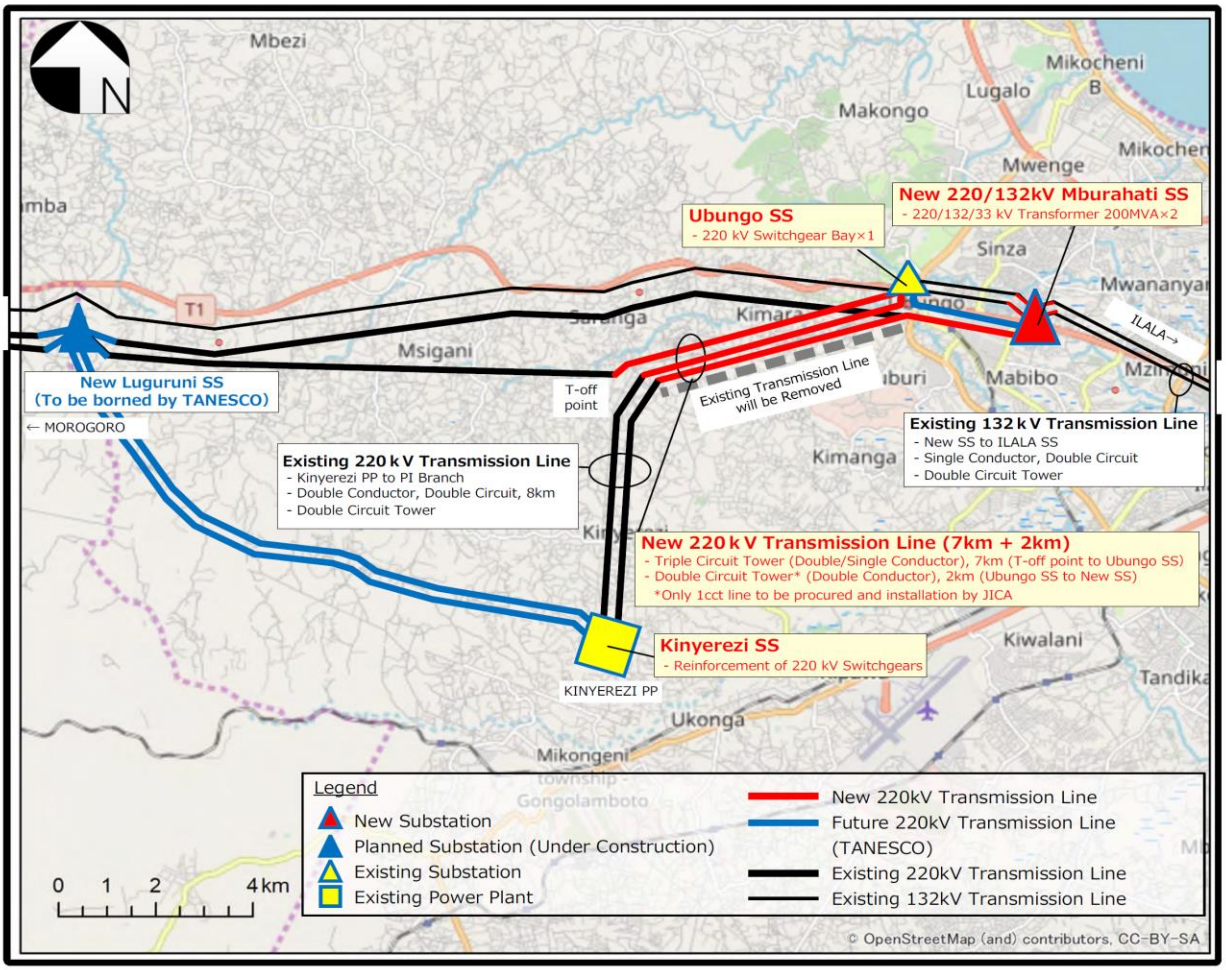

Figure 1: The Map Representing the Proposed Kinyerezi – Mabibo 220kV Transmission Line
Source: JICA Preparatory Survey Team, 2020

2.3 Project Components

The proposed project will involve construction of a new substation and triple circuit towers from Kinyerezi t-off point to Ubungo substation (7km) and double circuit towers from Ubungo substation to Mabibo substation (2km). The major components of this project are 220/132KV Substation and Transmission line.

2.3.1 Transmission Lines

The Transmission line consisting of series of towers of different type (Figure 2) and insulator that will run a total length of 9km with 220/132kV triple circuit conductors (3cct) from Kinyerezi T-off point to Ubungo Substation (7km) and double circuit conductors (2cct) from Ubungo S/S to Mabibo area (2km). Since there is no designed standard for way leave size for triple circuit conductors and towers it was recommended to use 40m size ROW which will cover 20m wide on both sides from the centreline. The proposed transmission and substation will utilize the existing way leave to avoid relocation of people and expensive compensation therefore no additional land will be acquired for the proposed project. Example of tower to be used for the proposed project is shown in Figure 2.

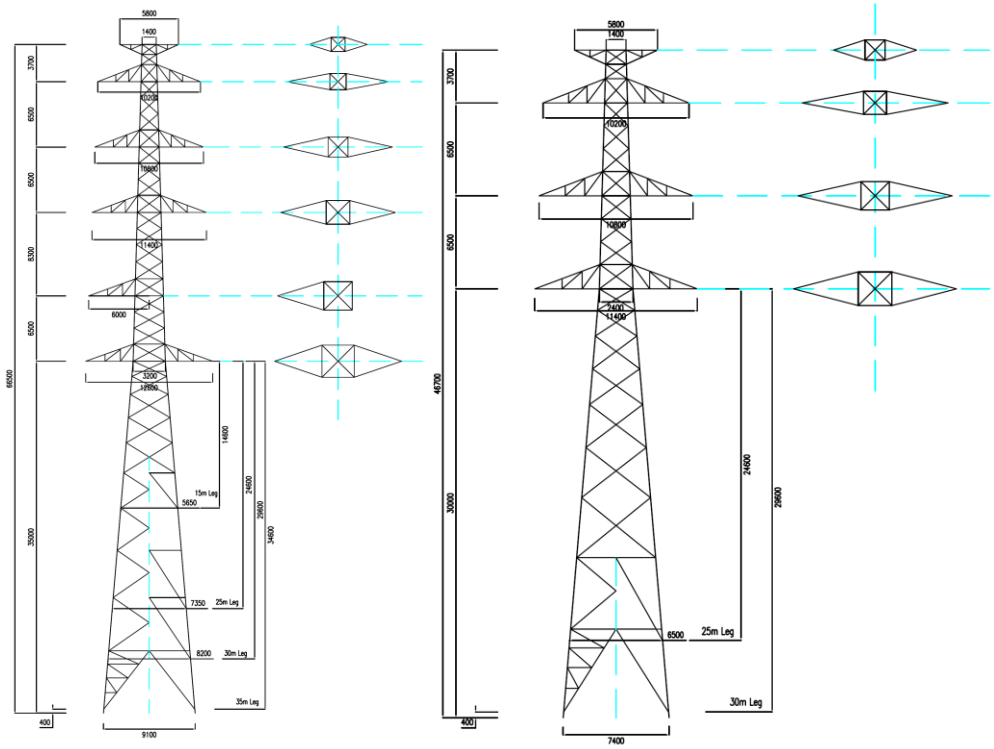

Figure 2: Example of tower to be used for the proposed project (Left: 3cct and Right: 2cct
Source: JICA Preparatory Survey Team, 2020

2.3.2 Substation

The project will involve the construction of a new 220/132kV substation at Mabibo area near the National Institute of Transport (NIT). The new 220/132kV substation is proposed to have 200 MVA transformers x 2 and Hybrid Gas Insulated Switchgears (H-GIS) which can be applied due to the limited area of 50m x 500m. The substation area is planned to be within the ROW of transmission line between Mabibo market and the compound of the National Institute of Transport (NIT). No additional land acquisition is expected for the substation. Facilities expected at substation are control building with switchgear, cable trenches, transformers, reactors, and vehicle parking bay. Transformers will be filled with oil without PCBs. Also, the substation will be fenced properly to minimize the potential for the accidental electrocution to people and animals, and is accessible by a permanent road. The preliminary design for the proposed substation is shown in Figure 3.

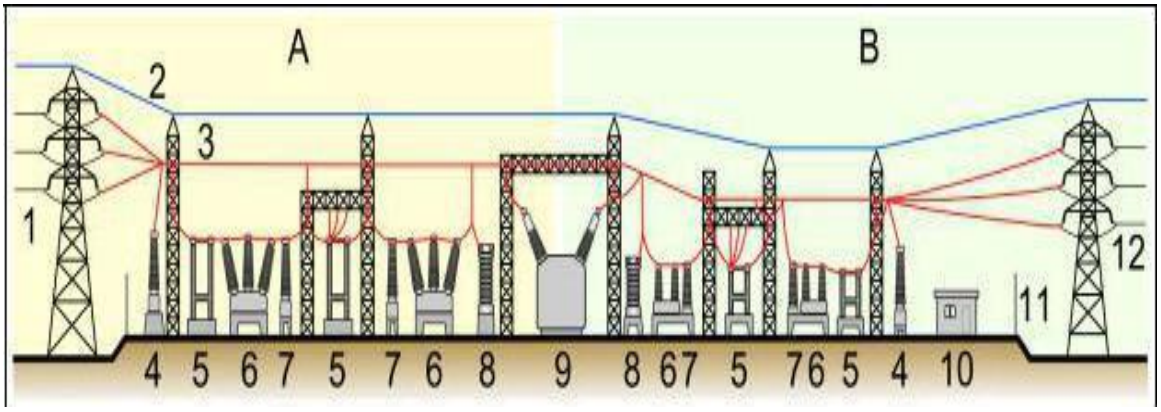

Figure 3: Elements of a substation

A: Primary power lines' side B: Secondary power lines' side

1. Primary power lines
2. Shield wire
3. Overhead lines
4. Transformer for measurement of electric voltage
5. Disconnect switch
6. Circuit breaker
7. Current transformer
8. Lightning arrester
9. Main transformer

10. Control building
11. Security fence
12. Secondary power lines

Functions of the Substation

The proposed substation is designed to function as follows:

- As voltage control mechanism through the transformers to step-up or step-down the system voltage as case might be, thereby lowering transmission losses.
- Correction of power factor in the circuits when the reactive loads are there to protect the generating plants and increase efficiency.
- For load shedding purposes on the distribution network there maintaining system balance.
- For the purposes of safety by switching and isolating the network during maintenance work, using circuit breakers and isolators including load demand sharing.
- Bus bar splitting for power distribution arrangement.

2.3.3 Materials and Other Utilities

Matrials required includes materials for civil works (foundation for transformers and reactors), transformers and reactors. Other utilities required include protection systems are needed for main and back-up in case of unexpected system failure,Communication and SCADA System and Firefighting System.

A list of equipment/machine(s) of the Project

Components		**Capacity**
Procurement and Installation Work		
1. 220/132 kV Mabibo Substation	(a) 200 MVA*, 220/132/33 kV transformer	2 units
	(b) 220 kV switchgear	1 Lot
	(c) 132 kV switchgear	1 Lot
	(d) Control/supervisory and Protection panels	1 Lot
	(e) Substation power supply system	1 Lot
2. Expansion of Ubungo Substation	(a) 220 kV switchgear (Transmission line bay)	1 Bay
	(b) Control and Protection panels	1 Lot

3. Reinforcement of Switchgear at Kinyerezi Power Plant	a) Replacement of existing 220 kV equipment for 2 x transmission line feeders	1 Lot
4. 220 kV Transmission Line	(a) 220 kV Transmission Line (Triple circuit) from Kinyerezi Power Plant (T-off point) to Ubungo Substation	Approx. 7.0 km
	(b) 220 kV Transmission Line (Double circuit) from Ubungo Substation to Mabibo Substation	Approx. 2.0 km
5. 132 kV Transmission Line	- 132 kV Transmission Line (Double circuit) between the existing transmission line (Ubungo – Ilala) and Mabibo Substation	1 Lot
Procurement Work		
6. Maintenance Tools for the Equipment to be procured under the Project		1 Lot
7. Spare parts for the Equipment to be procured under the Project		1 Lot
Civil Work		
8. Control Building of Mabibo Substation		1 building

2.4 Project Activities

As part of project implementation, this project will involve several activities categorized into different phases as explained below:

2.4.1Mobilization phase

The project activities during mobilization phase include mobilization of human resources, designing of the structures, obtaining various permits that include environmental permits, mobilization of resources, and importation of machinery and purchase of various construction materials. Mobilization entails establishing work camp and offices on the site, assembling equipment, construction work force as well as materials. Work camp will be established to provide shelter and storage facilities for construction material, fuel and lubricants, workshops, logistics and offices for less than 5 months during the construction period.

2.4.2 Construction Phase

The Construction phase will include excavation of tower foundations, erecting the towers, stringing of conductors and securing the site and construction of facilities for the substations and transformers as needed. Machines and manual labor will be involved in the construction phase. Some areas will require preparation of the access roads to bring equipment, workforce and materials to the designated sites. Appropriate measures for mitigation will be considered according to the Environmental and Social Management Plan (ESMP). Some labor forces may be recruited from local communities - especially for the simple and manual operations that could easily be accomplished using local skills. The construction phase is estimated to take roughly about 12 to 24 months.

2.4.3 Operation

The proposed transmission line is designed to last for 50 years where project operation with periodic maintenance and repairs will be undertaken. During operation, the power line will function as transmitter of power from Kinyerezi gas fired power plant and another circuit will transmit Morogoro two power line to the new substation at Mabibo. The new substation will step down and step up power as per received and required current at particular time depending on prevailing condition of the power grid. Monitoring, repair, and maintenance of the transmission line and substation will be done as per manufacturer and designers specification taking into account emergence issues and corrective actions in case of accidents and emergencies. Maintenance of 220 kV transmission line, safety management of the line maintenance and safeguard of the RoW will be done in the operation phase.

2.4.4 Decommissioning

Decommission of the project will take place in two phases, phase one decommission will involve demolition of existing doble circuit towers from Kinyerezi T-off point to Mabibo area where new triple circuit towers will be constructed. Demolition of existing tower will involve removal of insulators, cables, dismantling of towers and excavation of previous foundations to remove casted concrete. Other activities will involve removal of waste from dismantled towers and rubles from casted foundations and clearing of the site to allow new construction to take place.

Phase two of the decommissioning will involve the decommission of the new line when the transmission line and substation become unusable from reasons, decommissioning of the transmission line and substation may be carried out in the ESMP to be made as a part of the Environmental Impact Assessment report.

The main issues of concern will be removal and handling of cleared materials. Other issues include noise and dust level due to demolition of structures and restoration of the area. Decommissioning will involve the demolition of the structures and rehabilitating the land on which the structures were established to its original condition.

3.0 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

3.1 Introduction

The proposed 220kV transmission line from Kinyerezi T-off Point to the new 220/132kV substation at Mabibo area is expected to generate both positive and negative impacts on the ecological, economic and social environment. As a result, there is need to ensure that throughout the life of the project, there is compliance with relevant national polices, legislations, administrative frameworks and standards on the management of the environment. Tanzania has also ratified several international agreements and conventions on environmental management, which demand interventions in, project planning, construction and operation. Also, other policies such as from the IFC and World Bank Policies and JICA guiding energy projects, need to be taken into account. Below is a review of the policies and laws that are relevant to the proposed development.

3.2 Relevant Policy and Legal Frameworks in Tanzania

3.2.1 The Policy Framework

The proposed construction of the 220kV power transmission line from Kinyerezi T-off Point to the new 220/132kV substation near Mabibo area about 9km; which will involve construction of a new substation and triple circuit towers from Kinyerezi T-off point to Ubungo substation (7km) and double circuit towers from Ubungo substation to Mabibo substation (2km) will have ramification to several policies. Below is a brief description of some of the relevant policies that the project will touch upon and which have to be adhered to for guidance.

National Environmental Policy, 1997

The environmental policy of 1997 seeks to provide the framework for making the fundamental changes that are needed to bring consideration of the environment into the mainstream of the decision making processes in the country. The National Environmental Policy, 1997 stresses that for a framework law to be effective, environmental standards and procedures have to be in place.

The National Environmental Policy of 1997 outlines six major environmental tribulations that include ensuring sustainability, security and the equitable use of resources; environmental

pollution; land degradation and loss of wildlife habitats and biodiversity (URT, 1997). The Policy stipulates that an EIA shall be mandatory for all major projects to ensure that environmental concerns receive due and balanced consideration in reconciling urgent development needs with long-term environmental sustainability goals. The proposed project of 220kV power transmission line will have to be developed taking into account the requirements of this policy, particularly issues related to environmental pollution and land degradation.

National Energy Policy, 2015

The main objective of the National Energy Policy of 2015 is to provide directives for sustainable development and utilization of energy resources to ensure optimal benefits to Tanzanians and to contribute towards the transformation of the national economy. Tanzania is intending to become an industrial – middle income country by 2025 and therefore, provision of affordable, sustainable and reliable energy is key prerequisite to the success of the planned development goal of becoming industrialized.

The main scope for the Energy Policy of 2015 includes the following:

(a) To promote petroleum and gas upstream, midstream and downstream activities
(b) To promote renewable energy and energy conservation (non -hydro renewables include solar, wind, biomass and geothermal)
(c) To address cross cutting issues such as matters of subsidies, institutional, legal, regulatory as well as monitoring and evaluation.

Matters related to the environment are discussed under the cross cutting theme of the policy, which focuses on (a) Transparency and accountability (b) Regional and International Cooperation (c) Safety, Occupational Health and Environment, and (d) Gender issues and HIV/AIDS in the Energy. In this context, the Policy is advocating the application of tools such as Environmental Impact Assessment (EIA) for energy projects. Also, the Policy is promoting establishment of disaster prevention and response plans and the use of practices such as Polluter-Pays- Principle. Therefore, in order to meet the Policy objectives, the Government shall undertake the following measure:

a) Enforce environmental, health and safety standards and laws governing the Energy Sector
b) Ensure that contractors in the energy sector establish a decommissioning fund for environmental restoration where appropriate,
c) Strengthen institutional capacity in monitoring and enforcement of laws and regulations on safety, occupational health and environmental management.

The proposed 220kV Transmission line from Kinyerezi T-off Point to the new 220/132kV substation at Mabibo area must take into account the provisions of this Policy in ensuring that the final project promotes the supply of energy in the most environmentally and socially acceptable way.

The National Natural Gas Policy, 2013

The natural gas Policy of 2013 provides a comprehensive framework for addressing challenges that this sector faces. The Policy seeks to ensure optimal benefits to Tanzanians and the national economy. Maximization of the benefits will be attained through the optimization of the value chain, which includes up, mid and downstream activities. The formulation of this Policy was aligned with the National Development Vision 2025, the National Energy Policy of 2003, the Five Year Development Plan (2011/12 - 2015/16) and the Second National Strategy for Growth and Reduction of Poverty 2010/11 - 2014/15 (NSGRP/MKUKUTA II), and other sectoral and cross-sectoral policies.

Specifically, the National Natural Gas Policy has several objectives but the following are relevant to this project:

- To ensure the reliability of natural gas supply;
- To promote linkages between the natural gas industry with other strategic sectors of the economy;
- To substantially improve Corporate Social Responsibility in communities neighboring natural gas facilities and operations;
- To promote rational use of natural gas in all sectors of the economy;

To ensure compliance with Health, Safety and Environment standards in the natural gas

- value chain;

- To ensure that development of natural gas industry regionally and internationally benefits Tanzania;
- To support activities in the natural gas industry based on gender issues and addressing HIV/AIDS and other infectious diseases;
- To ensure maximization of benefits from the natural gas industry through PPP projects.

The proposed development, which is intended to improve power transmission and distribution in Dar es Salaam, will convey energy from Kinyerezi substation carrying both gas powered and hydro powered energy will take into account some of the objectives of this policy.

Water Policy, 2002

The main objective of the National Water Policy of 2002 is to develop a comprehensive framework for sustainable development and management of the Nation's water resources and putting in place an effective legal and institutional framework for its implementation (URT, 2002).

The Policy recognizes the fundamental but complicated linkages between water and socio-economic development, including environmental services. The proposed development will put additional demand on water for construction in an area where already, water is a very scarce resource. This EIA will examine water demand and supply issues for the proposed development in relation to available resources, other users and address the implications of water demand arising from the establishment of transmission line

The National Health Policy, 2007

The National Health Policy defines health as a state of wellness physically, mentally, socially and the absence of diseases. Further, it notes "good health contributes to personal development, the development of the family and the country; especially in ensuring improved livelihoods and poverty reduction" (URT, 2007). In view of this, the Policy aims to achieve sustainable welfare for the society.

The main goal of the National Health Policy of 2007 is to provide geographically balanced and in acceptable standards, affordable and sustainable health services in general. The general objective of the 2007 Health Policy is to uplift the health status of the citizens, especially the

vulnerable groups by putting in place health infrastructure that meets community expectations and increase life expectancy of Tanzanians. To achieve this general objective and to realize the policy goal, the National Health Policy has identified nine specific objectives including these two that are directly related to the proposed development.

(a) To reduce the occurrence and spread of diseases and deaths among the citizens so as to raise life expectancy
(b) To prevent and control infectious and non-infectious diseases especially HIV/AIDS, malaria, tuberculosis, malnutrition and work place diseases.

Also, the Policy is promoting environmental cleanness in residential areas, work places, improved worker's health and safety and promotion of nutritional programmes and to prevent accidents. Further, the Policy is addressing crosscutting issues such as disaster management, HIV/AIDS, gender focus, poverty reduction, human rights and environmental protection. The proposed transmission line may trigger health challenges including those that this policy is concerned about. The spread of HIV/AIDS in construction camps is a real threat that needs attention. Thus many provisions of this policy are relevant to the project.

National Land Policy, 1995

The overall aim of the National Land Policy (URT, 1995) is to address the various and ever-changing land use needs and "to promote and ensure a secure land tenure system, to encourage the optimal use of land resources and to facilitate broad-based social and economic development without endangering the ecological balance of the environment (ibid: 5). Several specific objectives are outlined in the Policy; however, the following are directly related to the proposed power generation project from Kinyerezi T-off Point to the new 220/132kV substation at Mabibo area.

- Ensure that existing rights in land whether titled or customary rights of holders are recognized, clarified, and secured in law;
- Ensure that land is put to its most productive use to promote rapid social and economic development of the country;

- Protect land resources from degradation for sustainable development.

The power transmission line will utilize existing way leave of Morogoro two (MG2) and existing Ubungo way leave on the second portion of the line, the new substation will be constructed on the existing way leave corridor. However this policy will need to be abided throughout the project development.

Sustainable Industrial Development Policy – SIDP, 1996

Sustainable Industrial Development Policy-SIDP (1996- 2020) (URT, 1996) is a framework for Tanzania's industrialization process within the short, medium and long terms perspectives. The main objectives of the SIDP include human development and creation of employment opportunities; economic transformation for achieving sustainable economic growth; external balance of payments; environmental sustainability ad equitable development (URT, 1996).

The Policy outlines several strategies for achieving the mission and objectives of industrialization and a range of activities that are to be implemented within short, medium and long-term priority activities. Within the short-term period (1996-2000), the Policy will promote rehabilitation and consolidation of existing industrial capacities through a series of restructuring. The focus is privatization of the public industries. During the medium term period (2000-2010), the Policy promotes creation of new "capacities in areas with potential for gaining competitive advantage including preparation for exploitation of the country's iron ore deposits taking into account merging technological innovations" (URT, 1996). The long-term phase (2010-2022) will focus on basic goods industries. The 5th Phase Government is promoting industrialization and the attainment of middle-income level by 2025. The proposed power development will support the objectives of this policy, which also recognizes the need for EIA prior to implementation of the projects.

Small and Medium Enterprises Development Policy, 2003

The Small and Medium Enterprises Development Policy (SMEDP), (URT, 2003) harmonizes the role of informal sector that constitute the bulk of the SMEs in Tanzania. The main objective of the SMEDP is to foster job creation and income generation through promoting the creation of new SMEs and improving the performance and competitiveness of existing ones to increase their participation and contribution to the Tanzania economy" (URT, 2003: 16). The Policy defines

SME as entities mainly based on non-farm economic activities in manufacturing, mining, commerce and services, employing between 5 - 99 people with capital investment of Tshs. 5 million to 800 million (*ibid*: 4).

The proposed development is expected to stimulate growth and spread of SMEs that may be engaged in a variety of activities, including small scale industries and manufacturing in view of the availability of reliable and affordable energy supply. This Policy is relevant since additional businesses that need reliable power are likely to be intensified as result of the improved power transmission and distribution.

Community Development Policy, 1996

The Community Development Policy (URT, 1996) underpins the problems that communities in Tanzania are facing, including underdevelopment and notes that people must be enabled to develop their capacity to identify problems and develop ways of tackling them. The proposed development will have major implications on community development in terms of providing power that can stimulating growth in various sectors of the economy and improve human welfare and livelihoods.

The National Employment Policy, 1997

The National Employment Policy (1997) aims to identify potential areas for employment and to lay down strategies of how to utilize such opportunities in promoting employment in the country. The proposed Project provides avenues for employment opportunity and thus supports the national employment policy. Employment opportunities arising from this project should be extended to all people in terms of skills, numbers and groups (youths, women and others as per the policy).

National Human Settlements Development Policy, 2000

The overall objective of the National Human Settlements Development Policy (NHSDP) is to promote the development of sustainable human settlement and to facilitate the provision of adequate and affordable shelter to all people, including the poor. The policy outlines a number of objectives including environmental protection within human settlements and protection of natural ecosystems against pollution, degradation and destruction.

The NHSDP recognizes planning and management of human settlement areas as one of the broad human settlement issues. Within this regard, the NHSDP identifies environmental protection as one of the strategic issues in human settlement planning and development. NHSDP also addresses the following issues:

- Lack of solid and liquid waste management, leading to environmental deterioration;
- Emission of noxious gases from vehicles and industrial activities as a major cause of air pollution in urban areas;
- Encroachment into fragile and hazardous lands (river valleys, steep slopes and marshlands) leading to land degradation, pollution of water sources, etc.;
- Increasing dependence on firewood and charcoal as a main source of energy in human settlements leading to depletion of forest, environmental deterioration and air pollution; and
- Un-authorized sand mining in river valleys leading to environmental degradation.

The proposed development aimed at improving power supply in the Dar Es Salaam, resulting into reducing dependency on firewood and charcoal however relocating people may cause human being encroaching into fragile and hazardous areas or unplanned settlement. This EIA addressed the issue of human settlement and suggests mitigation measures.

The Tanzania Development Vision 2000

Composite Development Goal for the Tanzania Development Vision 2025 (URT, 2000) foresees the alleviation of poverty through improved socio-economic opportunities, good governance, transparency and improved public sector performance. These objectives, not only deal with economic issues, but also include social challenges such as education, health, the environment and increasing involvement of the people in working for their own development. The thrust of these objectives is to attain a sustainable development of the people.

The Vision 2025 seeks to mobilize the people; the private sector and public resources towards achieving shared goals and achieve sustainable semi-industrialized middle market economy by year 2025. The improvement of the transmission line project is aimed at increasing supply of

energy and increase employment opportunities to enable development to take place. The improved power supply is expected to result into national development and improvement of livelihoods.

3.2.2 Regulatory Framework

- ***The Environmental Management Act, 2004***

The Evironmental Management Act no. 20 of 2004 seeks to provide for legal and institutional framework for sustainable management of environment; it outline principles for management, impact and risk assessments, prevention and control of pollution, waste management, environmental quality standards, public participation, compliance and enforcement, as part of implementation of the National Environment Policy.

Part VI of EMA (2004) deals with EIA and other assessments and directs that EIA is mandatory for all development projects. Section 81(2) states that the EIA study shall be carried out prior to the commencement or financing of a project or undertaking, while Section 81(3) states that a permit or license for the carrying out of any project or undertaking in accordance with any written law shall not entitle the proponent or developer to undertake or to cause to be undertaken a project or activity without an EIA certificate issued under the EMA (2004). Therefore, this EIA study complies with the requirements of EMA (2004) as the proposed project falls under **category A** project particularly item 7 of the First Schedule of the Environmental Impact Assessment and Audit (*Amendment*) Regulation, 2018 – GN 474; demands mandatory EIA on all projects concerning **"Energy" –**Transmission of Electricity**.**

- ***The Environmental Impact Assessment and Audit Regulations, 2005***

These Regulations were made in terms of Section 82 and 230 of the EMA (2004). The Regulations set procedures for carrying out EIAs and Environmental Audits (EAs). The Regulations are applicable to all projects contained in Third Schedule of the EMA (2004) and First Schedule of the Regulations. The Schedules list types of projects requiring EIA as well as those requiring project brief, project screening criteria, and steps for conducting EIA. *The steps enhanced further in the Environmental Management (Environmental Impact Assessment and*

Audit) (Amendment) Regulation, 2018 – GN 474. The Regulations set out in detail the process to be followed in conducting an EIA, the form and content of EIAs, the review process, decision-making processes and appeals and also prescribes the stages and/or the EIA process, which are in principal managed by NEMC. The proposed development would involve construction of power transmission line and substation, thus becoming relevant to the first schedules paragraph 7 (a) of the Regulations. It is thus a legally binding requirement to undertake the EIA of this Project.

Environmental Management (Standards for the Control of Noise and Vibration Pollution) Regulations, 2015 – G.N.# 32 of 30/1/2015

The main objective of these regulations includes:

(a) To ensure the maintenance of a healthy environment for all people in mainland Tanzania; the tranquility of their surrounding and their psychological wellbeing by regulating noise and vibration levels;
(b) Prescribe the maximum permissible noise and vibration levels from a facility or activity;
(c) Provide for the control of noise and vibration and mitigating measures for the reduction of noise and vibration;
(d) Set baseline parameters on noise and vibration permissible levels based on a number of practical considerations and acceptable limits;
(e) Enforce minimum noise and vibration limits prescribed by the National Environmental Standards Committee;
(f) Help developers such as industrialist to keep abreast with environmentally friendly technologies;
(g) Ensure protection of human health and the environment from various sources of noise and vibration pollution.

Regulation 7 (1-2) prescribes general prohibitions on noise and state " no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise that annoys, disturbs, injures or endangers the comfort, repose health or safety of others and that of the environment" Several factors are considered before noise is considered beyond acceptable levels. These include (a) time of the day (b) proximity to residential area (c) proximity of noise control zones, including hospital and schools (d) whether the noise is recurrent, intermittent or constant (e) the

level and intensity of the noise (f) whether the noise has been enhanced in levels or range by any type of electronic or mechanical means (g) whether the noise can be controlled without much effort or expense to the person making noise.

Regulation 8 refers to prohibition on excessive vibration and states that "no person shall (a) Make or cause to be made excessive vibration which annoys, disturbs, injure or endanger the comfort, repose health or safety of others and the environment (b) Cause to be made excessive vibrations which exceed 0.5 centimeters per second beyond any source, property boundary or 30 meters from any moving source.

Regulation 9 refers to the permissible noise levels and tolerance limits for environment vibrations. These are noise levels measured during the day (06:00am to 10:00pm) and the night (10:00pm to 06:00am). Part IV of the First Schedule provides allowable noise levels from construction sites to buildings other than homes, institutions of higher learning, homes for disabled persons,, which is 75 dBA during the day and 65 dBA during the night. Part I of the First Schedule provides the permissible noise levels for general environment; in industrial area as 70 dBA during the day and 60 dBA during the night. Part VI of the First Schedule provides the maximum noise level from a place of entertainment or establishment in the Noise Control Zone.

According to these regulations, excessive vibration will not be permissible anywhere within 10 meters of residence, hospital, schools, or other premises in which people could reasonably expect to be free from undue annoyance and nuisance caused by vibration.

The Second Schedule of these regulations provides details regarding tolerance limits for environmental aspects. For example, tolerance limits for whole body vibration (measured at an exposure of 8 hours is 1.15 m/s^2 while the exposure action value is 0.5m/s^2. Limits for hand arm vibration also measured at 8 hours exposure is 5m/s^2 with an exposure action value of 2.5 m/s^2. These limits are for individuals operating machines that emit vibrations. Tolerance limits for receptors – e.g. through ground vibration at sensitive sites) is 5 mm/s PPU at all times and for subsonic vibration (air over), it is 120dBL at all times.

These regulations also provide directives on how to carry out monitoring of the impact of noise and vibration. The proposed development must adhere to the provisions of these regulations.

Other Environmental Management (Standards) -Related Regulations

- ✓ Environmental Management (Air Quality Standards) Regulations, 2007;
- ✓ Environmental Management (Soil Quality Standards) Regulations, 2007;
- ✓ Environmental Management (Water Quality Standards) Regulations, 2007;
- ✓ Environmental Management (Solid Waste Management) Regulations, 2009; and
- ✓ The Environmental Management (Hazardous Waste Control and Management) Regulations 2021

The Project will be required to adhere to various provisions and standards stipulated in the above-listed regulations in order to comply with Section 141 and Part IX of EMA (2004).

The Electricity Act, 2008

The Electricity Act (URT, 2008) provides for the facilitation and regulation of generation, transmission, transformation, distribution, supply and use of electric energy and to support to broader trade in electricity and the planning and regulation of rural electrification and related matters (URT, 2008).

The Act provides requirements for obtaining licenses for (a) generation (b) transmission (c) distribution (d) supply, (e) physical and financial trade in electricity and electrical installation (URT, 2008). Any person intending to conduct any of the activities stipulated in Subsection 1 of Section 8 of this Act must apply for a license to the Energy and Water Utilization Regulatory Authority (EWURA).

The Land Act, 2019

The land Act of 2019 provides the legal framework for the implementation of the Land Policy. Among other things the Act recognizes that

(a) all land in Tanzania is public and vested in the President, as trustee on behalf of all citizens;

(b) existing rights in and recognized long-standing occupation or use of land are clarified and secured by the law

Moreover the Act facilitate an equitable distribution of and access to land by all citizens and ensure that land is used productively and that any such use complies with the principles of

sustainable development. The Acts also defines issues of land acquisition and compensation to affected people; '*to pay full, fair and prompt compensation to any person whose right of occupancy or recognized long-standing occupation or customary use of land is revoked or otherwise interfered with to their detriment by the State under this Act or is acquired under the Land Acquisition Act'.* The proposed development will utilize existing way leave, however in case of additional land requirement the provisions of this Act will be taken into account.

Land Acquisition Act, 1967

The Land Acquisition Act, (Act No. 47 of 1967) provide for compulsory acquisition of land for public interest and in connection with development aspects. Part II (b) of the Act refers to issues related to compensation and procedures that have to be followed when land is acquired. These procedures are also outlined in the Regulation for the Land Act and include issues of fair and prompt compensation to affected persons. The proposed development will utilize existing way leave, however in case of additional land requirement the provisions of this Act will be taken into account in this EIA.

Energy and Water Utilities Regulatory Authority Act, 2003

The Energy and Water Utilities Regulatory Authority (EWURA) (Act # 11 of 2001 and # 8 of 2003 (URT, 2006) establishes a Regulatory Authority in relation to energy and water utilities and outlines its *modus –operandi.* The Authority is responsible for regulating energy development and water utilities in Tanzania and requires relevant developers to obtain permits and authorization from EWURA for any proposed development. However the proposed development involves improvement of transmission line by replacing the existing 132kV and by construction a 220kV transmission line for transmission of existing or generated power, which may not requires permits. Moreover TANESCO as the main beneficiary has or is already allowed to establish and run such facilities in Tanzania and prior approval may not be necessary. However, notification to EWURA and in terms of business aspects will need to be made to EWURA as the regulator.

Water Resources Management Act, 2009

The Water Resources Management Act, 2009 (URT, 2009) provides a framework for the management and utilization of water, taking into account domestic, social, industrial and environmental needs. The Act provides principles and objectives of Water Resources Management, which includes among others (a) meeting the basic human needs of present and future generation (b) promoting equitable access to water (c) promoting the efficient, sustainable and beneficial use of water in the public interest (e) protecting biodiversity, especially the aquatic ecosystem (f) providing a system for the management of the resources and implementation of international obligations.

The Act directs the need to apply and pay all required fees for water utilization permits. It also directs the adoption of integrated water resource management approaches and the application of principles such as (a) precautionary principle (b) polluter pays principle (c) the principle of ecosystem integrity, to mention some.

The proposed development will be located in areas that might result to polluting water bodies (underground or surface run off) therefore; the provisions of this Act will be taken into account in order to safeguard this scarce resource.

The Industrial and Consumers Chemicals (Management and Control) Act, 2003

The Industrial and Consumers Chemicals (Management and Control) Act No 3 of 2003 (URT, 2003) provides a legal framework for the management and control of industrial and consumer chemicals throughout their life cycle.

The law requires that all those persons who intends to produce, import, export, sale, deal in industrial and consumer chemicals must register with the Registrar of Industrial and Consumer Chemicals so that their capacities to manage chemicals can be assessed. The law also requires that facilities used in the production, storage disposal of chemicals and waste must be registered for the same reasons of ensuring that they are of sound designs and are operated properly.

The proposed development will possibly be dealing with various chemicals that fall under this Act and the developer will thus be required to register with the Registrar of Industrial Chemicals

and have the facilities inspected and regularly monitored as provided for under Part III and IV of the Act. The carrying out of this EIA in part meets the requirement of the Act.

Occupational Health and Safety Act (OSHA Act, 2003)

The Occupational Health and Safety Act (No. 5 of 2003) deals with issues related to health and safety of workers in industrial areas. Under the Act, the Minister responsible for Labour shall appoint the Chief Inspector (CI) to perform the functions stipulated in the Act. Specific provisions of the OSHA Act – namely Section 21, 60, 61, 73-75 and 96 are relevant to the proposed development and therefore, they must be fully addressed in order to comply with this legal requirement.

The Act addresses issues of safe equipment, provision of personal protective equipment and a clean and safe work environment (e.g. provision of regular medical examination, air, drinking water, sanitary convenience, washing facilities, and accommodation for clothing, first aid facilities, including safety training etc.).

The proposed development should operate within the requirements of this Act in additional to those of the Electricity Act and others as outlined in this section.

The HIV and AIDS (Prevention and Control) Act, 2008

This Act provides for prevention, treatment, care, and control of HIV and AIDS; promotion of public health in relation to HIV and AIDS; appropriate treatment, care and support using available resources to those people living with or at the risk of HIV and AIDS; and related matters.

The Act also provides for the requirement of public education and programmes on HIV and AIDS. Section 8(1) of the Act states that the Ministry of Health and Social Welfare, health practitioners, workers in the public and private sectors and NGOs are required, for the purpose of providing HIV and AIDS education to the public, to disseminate information regarding HIV and AIDS to the public. Furthermore, Section 9 states that every employer, in consultation with the Ministry of Health and Social Welfare, shall establish and coordinate a workplace programme on HIV and AIDS for employees under his control and that such programme shall include provision of gender-responsive HIV and AIDS education.

The provision of this Act should be followed during the various stages of the project development in view of its potential to create conditions where HIV/AIDS transmissions are likely to occur. HIV/AIDS is a serious problem Dar es Salaam and the nation in general; therefore, measures must be taken to ensure that the disease does not spread as a result of undertaking development activities such as the planned work.

Public Health Act (2009)

The Public Health Act No.1 of 2009 provides for the promotion, preservation and maintenance of public health with a view to ensuring the provisions of comprehensive, functional and sustainable public health services to the general public and to provide for other related matters. The Act require relevant minister to promote, preserve and maintain a comprehensive, functional and sustainable public health system in Mainland Tanzania for the purpose of securing improvement in the health habits and lifestyles of people living in Tanzania.

The law requires relevant authorities among other things to:

(a) Take lawful, necessary and reasonable measures to prevent the occurrence of or deal with any out-break or prevalence of any infectious or communicable and non-communicable disease;
(b) Make sure an appropriate Environmental Health Impact Assessment Study to be conducted for all activities as may be provided for under the Environmental Management Act;
(c) Safeguard and promote the public health standards;
(d) Carry out inspections; and

The Public Health Act stipulates clearly that the developer should ensure welfare and health of workers is maintained at all times and make sure that routine medical examination for workers is conducted. The proposed transmission line project shall observe the provision of this Act.

The Employment and Labour Relations Act, 2004

This Act makes provision for core labour rights to establish basic employment standards; a framework for collective bargaining and the prevention and settlement of disputes and related matters. The developer for this project shall ensure that employment standards as provided for by the Act are adhered to.

The Workers Compensation Act, 2008

This Act provides for compensation to workers for injuries suffered in the course of their employment, which result in disablement or death. This Act needs to be complied with as project workers will be exposed to various dangerous and hazardous environments during project implementation.

Other regulatory frameworks that are relevant to the proposed development include; the Town and Country Planning Ordinance (Cap 378 of 1958) and Amendment of 1961, for planning purposes. Others are the Grave Removal Act, 1969 and Local Government (Urban Authorities) Act 1982. The provision of these Acts shall be followed to ensure compliance with the laws.

3.3 TANESCO'S Health, Safety and Environmental (HSE) Guidelines

TANESCO has already prepared and approved the Health, Safety and Environmental guidelines that every undertaking covering consultants, contractors and sub-contractor has to adhere to approved HSE guidelines to safe guard environment, community and for safety of worker and the environment.

Theproposedconstructionofthetransmissionlinesystemwillbeguidedbysimilaroperationprinciplesw hereenvironmentalandsocialissueswillhavetobe guided by the guidelines. In addition to having its own guidelines TANESCO are obliged to comply to other safe guard principles andguidelines issuedbyfinancierofaparticularproject.Inthiscasesafeguardprinciplesand guidelines will be mandatory.

3.4 The Institutional Framework

The Construction of a new 220kV transmission line from Kinyerezi T-off Point to the new 220/132kV substation at Mabibo is expecting to touch the interest of President Office Regional Administration and Local Government therefore; it falls under the jurisdictions of ***The Local Government Authorities*** for administrative purposes. The Local Government Authorities include the City Council, Municipal Council, Ward and 'Mtaa' which will be responsible for making that the interest of local communities are considered; these include employment opportunities associated with implementation of transmission line, protection from environment pollution as well as resolving conflict relating to the implementation of the proposed development.

Sections 30 to 40 of the Environmental Management Act, 2004 provides for institutional arrangement covering Sector Ministries, Regional Secretariat, Township, Ward, Village, Mtaa and Kitongoji Environmental Management Officers. Thus the District/Municipal environmental team, ward and mtaa will have to be involved and if these are not in place as required by the law, efforts must be made to ensure they are created and capacity is provided to them to effectively perform their duties.

In addition, beside the local institutional/administrative framework, the proposed project also falls under the Ministry of Energy and Ministry of Lands, Housing, Human Settlement Development. These ministries, through their different units will have to be involved at various stages of the project development and in particular their Sector Environmental Coordinators will have greater roles to play. Other institutions whose administrative decisions will be relevant to the proposed development include the Ministry of Health, specifically OSHA that will be responsible for ensuring compliance to occupational health and safety standards as provided under OSHA.

3.5 Relevant International Conventions and Treaties

3.5.1 International Conventions

Tanzania has signed and ratified several international conventions that this project will have to adhere to since the Government expressed commitments to enforcing them as part of its own laws and principles. Some of the conventions include the following:

3.5.2 International Convention on Biological Diversity

Tanzania is signatory to the Convention on Biological Diversity (CBD) since June 1992 and has taken steps to ensure conservation and use of these resources in judicious ways. Biological resources in Tanzania are facing a significant threat from unsustainable utilization. While Dar es Salaam may not be very rich in terms of biodiversity of large mammals and plants, it is nonetheless equally important to ensure the basic tenets of this Convention are adhered to in the project development.

3.5.3 The African Convention on the Conservation of Nature and Natural Resources, 1968

This Convention requires contracting states to adopt measures necessary to ensure conservation, utilization and development of soil, water, flora and fauna resources in accordance with scientific principles and with due regard to the best interests of the people. Protected species should be accorded special protection, including the maintenance of habitats necessary for their survival.

3.6 International Standards and Guidelines

Several international best practices relevant to the proposed development are available to inform policy choices that would enhance the sustainability of this project. Some of these are practices that the World Bank, International Finance Corporation (IFC) and JICA are following in their lending programs.

Many international organizations and financing agencies have aligned their safeguard policies alongside those of the World Bank and the IFC. Both the World Bank and IFC screening criteria characterize projects such as the proposed development as Category A projects namely those that are likely to have adverse impacts which have one or more of the following characteristics that make the potential impacts "significant":

(a) Direct pollutant discharges causing degradation of air, water or soil;

(b) Large-scale physical disturbance of the site and/or surroundings;

(c) Extraction, consumption, or conversion of substantial amounts of forest and other natural resources;

(e) Hazardous materials in more than incidental quantities; and

(f) Involuntary displacement of people and other significant social disturbances.

Tanzania screening criteria also classifies projects bearing almost the same characteristics as those of the World Bank as Type A projects. Thus, in all these cases (i.e., for the World Bank, IFC and Tanzania screening procedures) such projects calls for mandatory environmental impact assessment (EIA Regulations for Tanzania and Performance Standard #1 for IFC). This EIA is in line with these requirements.

There are Performance Standards and Environmental and Social Framework which replaces the

Operational Policies from the World Bank and IFC that are relevant to this project, and which will be addressed in the detailed EIA.

3.7 JICA'S Guidelines for Environmental and Social Considerations

The objectives of the guidelines are to encourage Project proponents to have appropriate consideration for environmental and social impacts; as well as to ensure that JICA's support for and examination of environmental and social considerations are conducted accordingly. The guidelines outline JICA's responsibilities and procedures, along with its requirements for project proponents in order to facilitate the achievement of these objectives.

While project proponents bear the ultimate responsibility for the environmental and social considerations of projects, JICA supports and examines appropriate environmental and social considerations undertaken by project proponents etc. to avoid or minimize development projects' impacts on the environment and local communities, and to prevent the occurrence of unacceptable adverse impacts.

JICA establishes "the Advisory Committee for Environmental and Social Considerations" as an independent council composed of external experts with the knowledge necessary to provide advice regarding support for and examinations of the environmental and social considerations of cooperation projects.

JICA confirms that projects comply with the laws or standards related to the environment and local communities in the central and local governments of host countries. JICA also confirms that projects do not deviate significantly from the World Bank's Safeguard Policies, and refers as a benchmark to the standards of international financial organizations; to internationally recognized standards, or international standards, treaties, and declarations.

There are some gaps between JICA guideline, World Bank Safeguard Policy and Tanzanian legislation on environmental and social consideration as below. Measures bridging the gaps are to be discussed with TANESCO.

4.0 EXISTING BIOPHYSICAL AND SOCIO-ECONOMIC ENVIRONMENT

4.1. Physical and Biological Environment

4.1.1 Location and topography

Dar es Salaam is characterized by flat topography along the coast of the Indian Ocean in the south–east and getting slightly undulating and hilly in the hinterland mainly in the north-west comprising large part of the project area. The city is divided into three zones, namely the upland zone comprising of hilly areas to the west and north of the city, the middle plateau, and the lowlands, which include Msimbazi Valley, Jangwani, Mtoni, Africana and Ununio areas (Fig.3). Topographically the city lies in a flood plain and/or near flood plains and thus flooding is one characteristic of the city, particularly when there are heavy rains. The beach and shoreline comprise sand dunes and tidal swamps. Coastal plains composed of limestone extend 10 km to the west of the city, 2-8 km to the north, and 5-8 km to the south (TSCP, 2014). Inland, alluvial plains comprise a series of steep-sided U-shaped valleys. The upland plateau comprises the dissected Pugu Hills (Dongus, 2000) located far southern west of the city. The local topographical conditions are further summarized in Table 1.

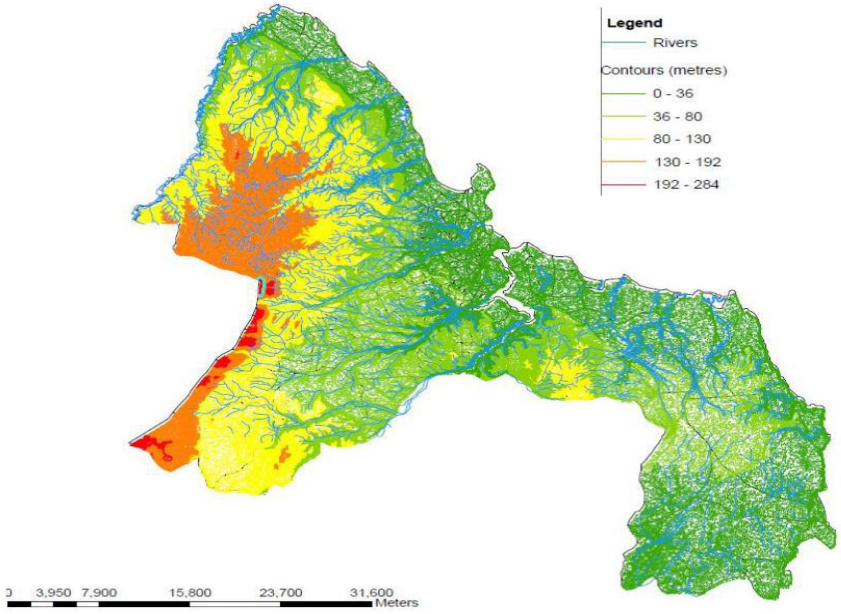

Figure 4: Topographical condition of Dar es Salaam City

Source*: TSCP, 2014*

Table 1: Topographical condition and associated characteristics

	Level	Condition
Lowland	<5 m	Areas in the bay area, river mouths and hinterland along the coast. Marsh and swampy areas widely spread, soft soil, thick and drains poorly
Plain/Terrace	5 – 20 m	Flat plains/terrace, extend along the coast and are generally a few kilometers wide. Geographically it belongs to the coastal plain
Terrace/Hill	20 – 60 m	This makes up the dominant of the residential terrain of Dar es Salaam, and are gently sloped areas, consisting of residual weathered limestone (murram-earth material); many of these terraced areas of 500 m to 1000 m are observed around the banks of dare s Salaam City, and have been known to act as flood plains
Hill	60 – 150 m	This zone extend to the Southwest of the study area, the geographical original of which is raised coral reefs, the undulating of which is dependent on the degree of weathering. Part of the project especially stretch from Ubungo substation to Mabibo substation is located in this zone
Mountain	> 150 m	In the West region of Dar es Salaam, 30 km inland, composed of limestone associated with sandstone of the older geographical area, steep and rigid slopes are formed. Part of the project area Ubungo and Kimara wards are located in this zone

Source*: TSCP, 2014*

4.1.2 Climate

Tanzania generally lies in the tropical savanna belt while Dar es Salaam is located in the wetter and warmer coastal area. High temperatures almost throughout the year, ranging from 19^0C to 33^0C, characterize the climate. The maximum temperature is experienced in October and November. The annual average temperature is 25.4^0C. Rainfall is bimodal with short rains falling from November to December and the long rains from March to June. Maximum average rainfall ranges between 800 mm to 1200 mm and mostly rains in April. The average maximum and minimum temperature and rainfall is shown in Figure 4 and 5.

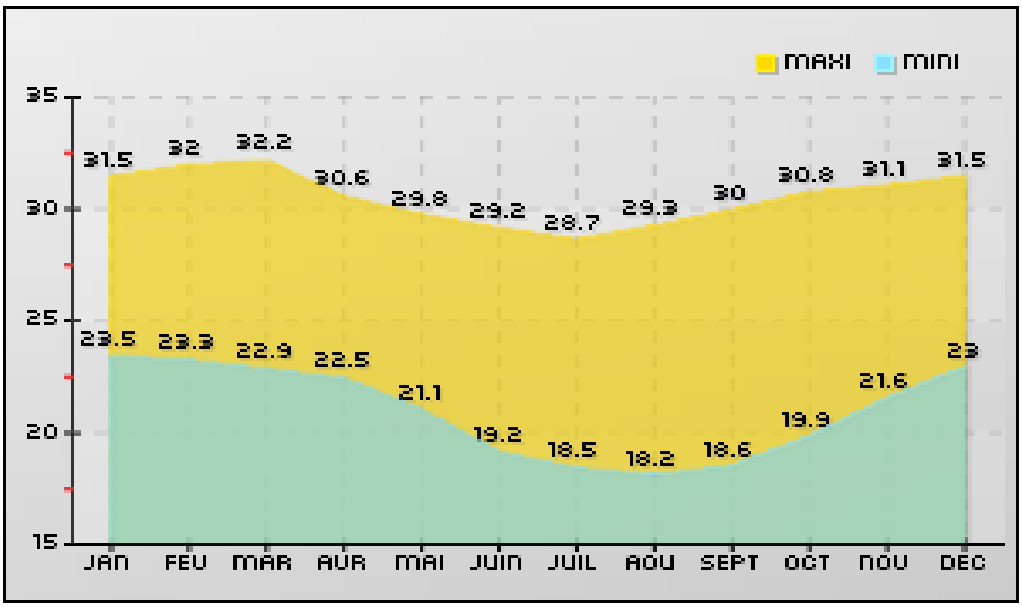

Figure 5: The average maximum and minimum temperature in Dar es Salaam
http://www.levoyageur.net/weather-city-DAR-ES-SALAAM.html. Accessed on 22nd March 2020

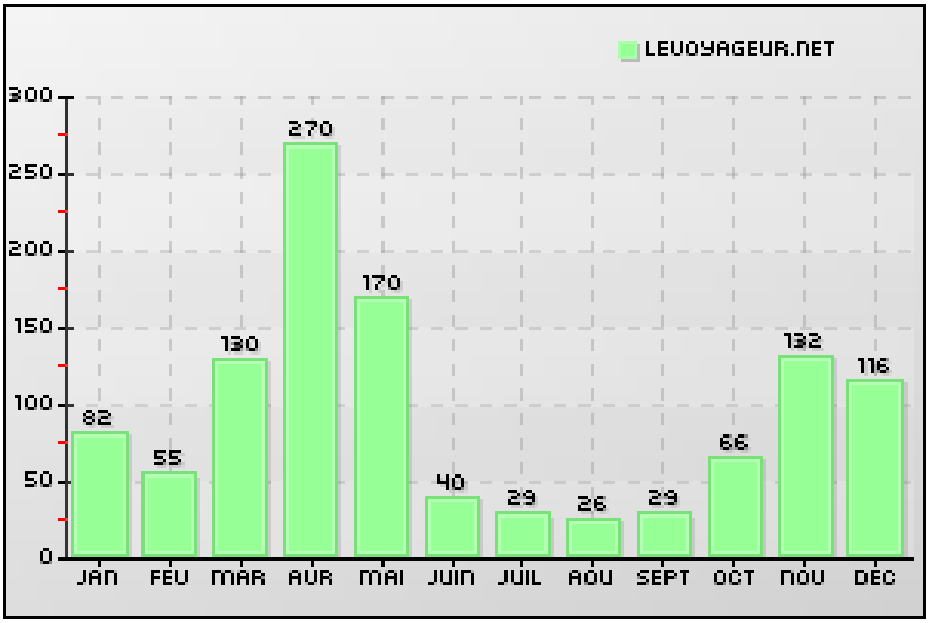

Figure 6: Average Rainfall in Dar es Salaam
http://www.levoyageur.net/weather-city-DAR-ES-SALAAM.html. Accessed on 22nd March 2020

4.1.3 Geology and Soils

According to the Quarter Degree Sheet 186 of the Geological Survey of Tanganyika (1963) Dar es Salaam has two major geological units: (i) The underlying substratum of (semi-) consolidated formations and outcropping rocks that consist of Neogene clay-bound sands to hard sandstone; and (ii) The superficial mainly loose sediments of the Quaternary System which are more extensive in the central and southern parts of Dar es Salaam region and consist of less consolidated terrace sands and sandstones and recent alluvium (Mtoni et al., 2012). The geological formation of Dar es Salaam is shown in Fig.6.

The soil found in Dar es Salaam City is often clayey and partly sandy, and therefore relatively unproductive regarding agricultural use (Dongus, 2001). In the river valleys, which are recent floodplains and subject to flooding, alluvial soils (mainly Eutric Fluvisols and Eutric Gleysols) are dominant (Muster, 1997). Soil erosion in the urban area occurs primarily at the slopes of river valleys, where no vegetation is left to hold the soil in place, and is intensified by human activities such as extraction of construction materials. Along the way leave corridor developing gullies signifying erosion are clearly seen on slopes from Ubungo Kibo to Kimara Mavurunza.

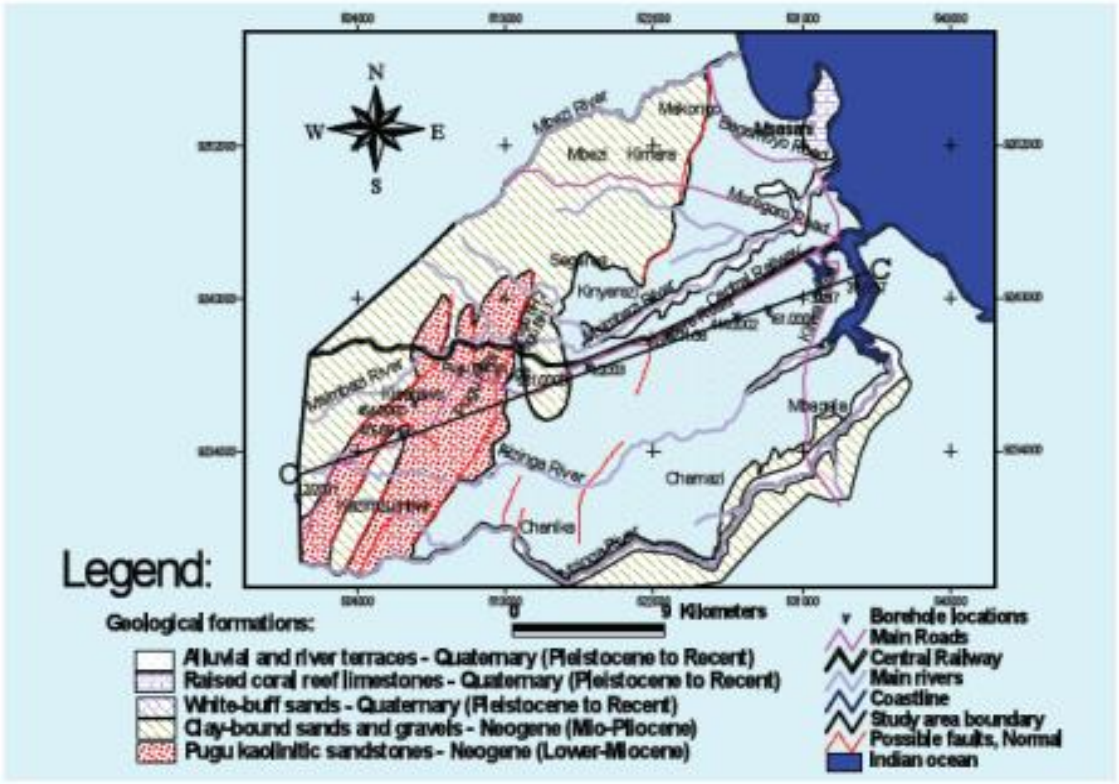

Figure 7: Geological formation of Dar es Salaam
Source: Mjemah, 2013.

4.1.4 Biodiversity, flora and fauna

The project being in urban area, large part of the project area is characterized by secondary vegetation modified from prevous disturbance caused by construction of MG2 transmission line, TPDC Gas pipeline and DAWASA water infrastructure. The existing land use in the project area include cultivation, built-up areas and some riverine vegetation (bush thickets mixed with annual herbs, grasses and some trees, mainly palms).

Due to the existing land use particularly settlements, much of the natural vegetation has been converted into none natural secondary vegetation in form of man made gardens, farms and landscaped areas. Tree species found include Neem trees (*Azadirachta indica*) and Ashoka trees (*Polyalthia longifolia*) and a few African teaks (*Tectona grandis*). In lower land areas vegatable farming along the wayleave corridor e.g near Urafiki textile industry and Ubungo maziwa are common.

- **Fauna**

There are limited wildlife resources in Dar es Salaam City due to its high demand for land for settlements and industrial development. The population particularly of larger animals has been significantly reduced. The main fauna found in the project area include domestic animals and some wildlife - predominantly generalists tolerant to human presence like rodents i.e. house rat (*Rattus rattus*) and giant cane rat (*Thryonomys sp*.), snakes (*Psammophis* spp.), shink (*Mabuya varia*), bufo (*Amietophrynus gutturalis*), other frogs and terrapins (*Pelusios* sp.). Similarly, carnivores like the banded mongoose (*Mungos mungo*) and genets (*Genetta* sp.) occur in a wide range of habitats (Hoffmann 2008). Also a diverse assemblage of seabirds is found in the Dar es Salaam Marine Reserves System (DMRS), including both seasonal migratory and local birds. The common bird species sighted include the White reef heron (*Egretta dimorpha*), and (*Egretta garzetta*), Whimbrel (*Numenius phaeopus*) and Sanderling (*Calidris alba*) (URT, 2005d).

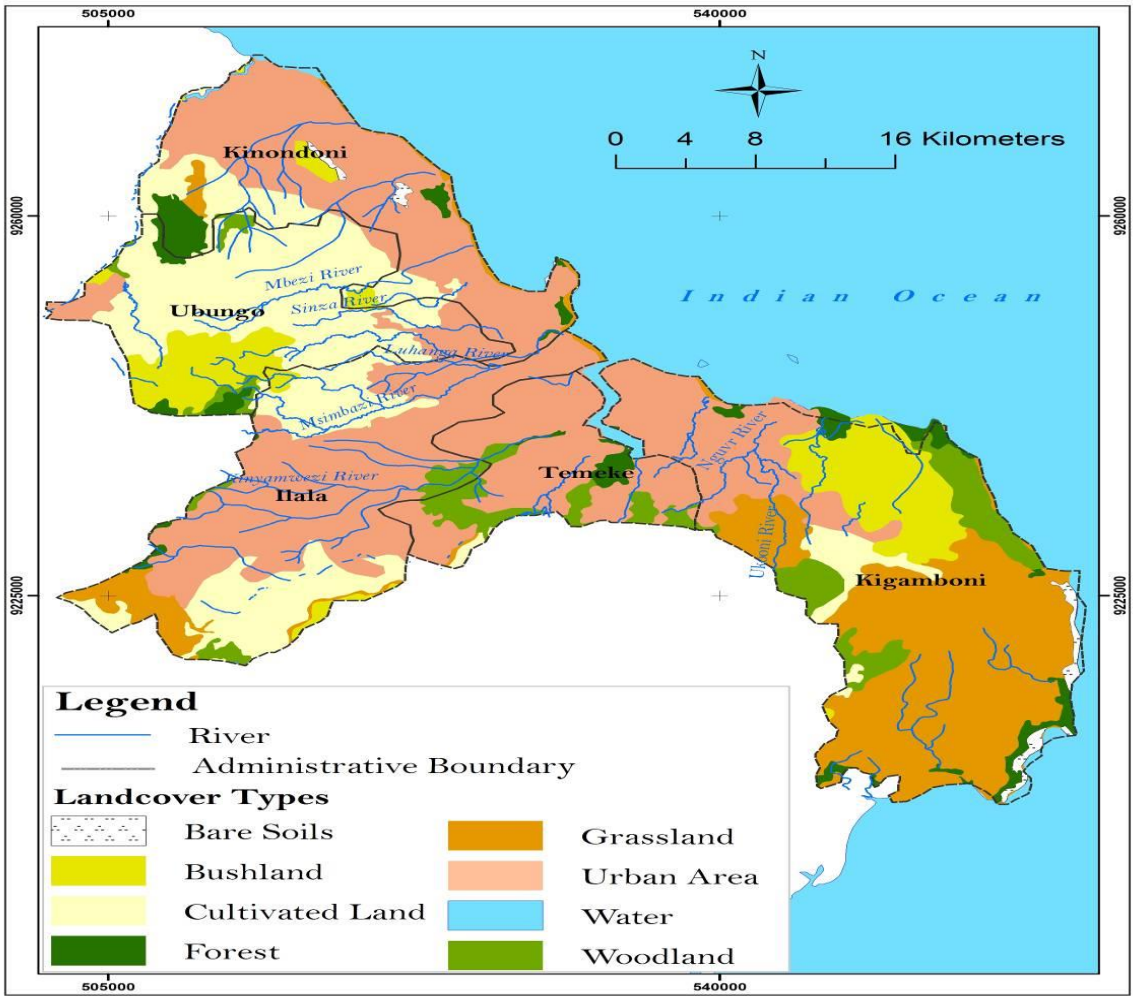

Figure 8: Vegetation cover of Dar es Salaam:
Source: *IRA GIS Lab, 2017*

4.1.5 Ambient Air Quality

The air quality parameter (particulate matter,($PM_{2.5}$ and PM_{10}) along the project substation and its near receptor such as Mabibo market, National Institute of Transport (NIT),Garage, and way leave area , the defined coordinate of the location were taken and described in the table of result. Level of particulate matter were determined by using hand held instrument with very response famously known as handheld laser particle counter model Number 3886 **(Kanomax**) (Photo 1), an instrument that measure particle size while the concentration of dust calculated to get exactly amount of dust inhaled(i.e. particle matter per unit area). Particle matter measurements were conducted between 09:00 AM and 6:00 PM for two days consecutive and time constant for one minute.

Photo 1: Handheld laser Particle Counter model 3887

The average level of dust in every location were collected for two days compared with the national limit set by Tanzania bureau of standard (TBS) and International standard limit set by International Finance Cooperation (IFC) are presented in the Table 2. The maximum concentration of particle matter (PM_{10}) in substation is 10.915 µg/Nm^3, while the minimum concentration is 1.732µg/Nm^3. All level of the PM_{10} shows the result were below the recommended national standard and international standard, of Pm_{10} which are 150µg/Nm^3 and

50µg/Nm^3 respectively. The maximum concentration of particle matter PM $_{2.5}$ in the substation is 0.12 µg/Nm3, while the minimum concentration is 0.089 µg/Nm^3.the level of result for PM10 and PM2.5 shows significantly below the limits set by TBS and IFC standards. All levels of the PM $_{2.5}$ are below the recommended national standard and international standard, of PM $_{2.5}$ are 75µg/Nm^3 and PM $_{2.5}$ are25µg/Nm^3 respectively.

Also the average level of dust in receptor of substation were collected for two days compared with the national limit set by Tanzania Bureau of Standard (TBS) and international standard limit set by International Finance cooperation (IFC) are presented in the Table 2. The maximum concentration of PM_{10} is 7.253 µg/Nm^3, 9.004 µg/Nm^3, 3.868 µg/Nm^3 and 2.398 µg/Nm^3 in the Mabibo market, National Institute of Transport (NIT), Garage and Way leave respectively while the maximum concentration of particle matter $PM_{2.5}$ was 0.104 µg/Nm^3,0.089 µg/Nm^3,0.103 µg/Nm^3 and 0.101 µg/Nm^3 at the Mabibo market, National Institute of Transport (NIT), garage and way leave of substation respectively. All levels of the particles at PM $_{10}$ and PM $_{2.5}$ are below the recommended by the national standards and international standards.

Table 2: Result of Particulate matter (PM_{10} and $PM_{2.5}$) measurement at Mabibo Substation and its receptor (Mabibo market, National Institute of Transport (NIT), Garage and way leave near substation)

LOCATION	DATE	TIME	PARTICLE MATTER (µg/Nm^3)	NATIONAL STANDARDS (µg/Nm^3)	INTERNATIONAL STANDARDS (µg/m^3)
Substation point 1: 37M 0524762 UTM 9248138	21-9-2020	11.13A.m	$PM_{2.5}$ 0.097	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 10.915	PM_{10} 150	PM_{10} 50
Substation point 2: 37M 0524721 UTM 9248154	21-9-2020	11.21a.m	$PM_{2.5}$ 0.084	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 1.732	PM_{10} 150	$PM_{2.5}$ 25
Substation point 3: 37M 0524822 UTM 9248116	21-9-2020	12.00p.m	$PM_{2.5}$ 0.12 PM_{10} 4.689	$PM_{2.5}$ 75 PM_{10} 150	$PM_{2.5}$ 25 PM_{10} 50
Substation point 1: 37M 0524762 UTM 9248138	22-9-2020	10.04a.m	$PM_{2.5}$ 0.093	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 2.392	PM_{10} 150	$PM_{2.5}$ 25
Substation point 2: 37M 0524721 UTM 9248154	22-9-2020	10.07a.m	$PM_{2.5}$ 0.089	$PM_{2.5}$ 75	PM_{10} 50
			PM_{10} 1.359	PM_{10} 150	$PM_{2.5}$ 25
Substation point 3: 37M 0524822 UTM 9248116	22-9-2020	10.43a.m	$PM_{2.5}$ 0.071	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 3.05	PM_{10} 150	PM_{10} 50
Receptor 1–Mabibo market –point 1 37M 0524777 UTM 9248194	21-9-2020	01.43p.m	$PM_{2.5}$ 0.076	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 6.033	PM_{10} 150	PM_{10} 50
Mabibo market point 2: 37m 0524746 UTM 9248233	21-9-2020	01.50p.m	$PM_{2.5}$ 0.067	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 3.868	PM_{10} 150	PM_{10} 50
Mabibo market point 1: 37M 0524777 UTM 9248194	22-9-2020	11.10a.m	$PM_{2.5}$ 0.09	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 7.253	PM_{10} 150	PM_{10} 50
Mabibo market point 2: 37m 0524746 UTM 9248233	22-9-2020	11.18 a.m	$Pm_{2.5}$ 0.104	$Pm_{2.5}$ 75	$Pm_{2.5}$ 25
			PM_{10} 5.769	PM_{10} 150	PM_{10} 50
Receptor 2: NIT –Point 1 37M 0524698 9248104	21-9-2020	12.43p.m	$PM_{2.5}$ 0.087	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 9.041	PM_{10} 150	PM_{10} 50
NIT –Point 2: 37M 0524772 UTM 9248092	21-9-2020	12.59p.m	$PM_{2.5}$ 0.089	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 6.229	PM_{10} 150	PM_{10} 50
NIT –Point 1: 37M 0524698 9248104	22-9-2020	11.35p.m	$PM_{2.5}$ 0.062	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 4.375	PM_{10} 150	PM_{10} 50

NIT –Point 2: 37M 0524698 UTM 9248104	22-9-2020	11.48p.m	$PM_{2.5}$ 0.065	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 6.644	PM_{10} 150	PM_{10} 50
Receptor 3 Garage area point 1: 37M 0524891 UTM 9248086	21-9-2020	12.16p.m	$PM_{2.5}$ 0.103	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 1.710	PM_{10} 150	PM_{10} 50
Garage area point 2: 37 M0524977 UTM 9248057	21-9-2020	12.27p.m	$PM_{2.5}$ 0.062	$PM_{2.5}$ 75	$PM_{2.5}$ 25µg/m^3
			PM_{10} 0.515	PM_{10} 150	PM_{10} 50µg/m^3
Garage area point 1: 37M 0524891 UTM 9248086	22-9-2020	10.56a.m	$PM_{2.5}$ 0.076	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 6.033	PM_{10} 150	PM_{10} 50
Garage point 2 : 37 M 0524977 9248057	22-9-2020	11.00 a.m	$Pm_{2.5}$ 0.067	$Pm_{2.5}$ 75	$Pm_{2.5}$ 25
			PM_{10} 3.868	PM_{10} 150	PM_{10} 50
Way leave area point 1: 37M 0524619 UTM 9248222	21-9-2020	11.27a.m	$PM_{2.5}$ 0.1	$Pm_{2.5}$ 75	$Pm_{2.5}$ 25
			PM_{10} 2.026	PM_{10} 150	PM_{10} 50
Way leave point area point 2 37M 0524417 UTM 9248269	21-9-2020	11.49p.m	$PM_{2.5}$ 0.0379	$PM_{2.5}$ 75	$PM_{2.5}$ 25
			PM_{10} 1.132	PM_{10} 150	PM_{10} 50
Way leave area point 1 37M 0524619 UTM 9248222	22-9-2020	10.21a.m	$PM_{2.5}$ 0.103	$PM_{2.5}$ 75µg/Nm^3	$PM_{2.5}$ 25µg/m^3
			PM_{10} 2.398	PM_{10} 150 µg/Nm3	PM_{10} 50µg/m^3
Way leave area point 2: 37M 0524417 UTM 9248269	22-9-2020	10.28a.m	$PM_{2.5}$ 0.107	$PM_{2.5}$ 75µg/Nm^3	$PM_{2.5}$ 25µg/m^3
			PM_{10} 0.611	PM_{10} 150 µg/Nm3	PM_{10} 50µg/m^3

Noise level

Noise levels were measured using digital sound level CASELLA CEL -63x sound level meter (Photo 2). The device meter scale was set to the 'A' weight measurement scale, which enables the device to respond in the same manner as human ear. The device was held approximately 1.5m above the ground. A weighting with an automatic measuring range of 30 to 130 dB. The measurement where taken for two days consecutive from 09.00 AM to 6.00 PM

Noise levels within the proposed project were measured at the substation (three point at the substation), and at receptor of the substation (National Institute of Transport, Mabibo Market, Garage area and Way leave), also in the receptor two point in the different location was taken. The average collected noise levels were compared with Tanzania National Standard (TBS) and International Finance Cooperation (IFC) standard limits as shown in Table 3. Maximum noise level at the substation area is 81.6 dB and minimum noise level is 70.3 dB, this result it significantly below the recommended limits standard set by Tanzania National Standard (TBS) while it's above the recommended international standard set by International Finance Cooperation (IFC).

The average collected measurement at the receptor of the substation (National Institute of Transport (NIT), Market area, garage and way leave) were compared with the national standard and international standard .the maximum noise level was 84.6Db,86.4,88 and 78.05,while the minimum noise level was 77.8,73.3,73.05 and 68.5 in the NIT, garage, Market area and way leave respectively .all of result was below the recommended national standard of Tanzania set by Tanzania bureau of standard (TBS) BUT it's above the recommended international standard set by International Finance Cooperation (IFC). these is because of human activities which are carried out in area selling and buying the commodities, high voice of radio and movement of car and truck in the garage cause increases of noise level.

Photo 2: Sound level CASELLA CEL -63x sound level meter

Table 3: Result of Noise level Measurement at Mabibo substation and its receptor points (National Institute of Transport (NIT), Garage, Mabibo market and way leave)

Location	Date	Time	Noise (dB)	National Standard of Noise (dB)	International Standard of Noise (dB)
Substation point 1: 37M 0524762 UTM 9248138	21-9-2020	11.13.a.m	70.3	85	70
Substation Point 2: 37M 0524721 UTM 9248154	21-9-2020	11.21a.m	76.7	85	70
Substation point 3: 37M 0524822 UTM 9248116	21-9-2020	12.00p.m	81.6	85	70
Substation point 1: 37M 0524762 UTM 9248138	22-9-2020	10.04a.m	76.3	85	70
Substation point 2: 37M 0524721 UTM 9248154	22-9-2020	10.07a.m	70.75	85	70
Substation point 3: 37M 0524822 UTM 9248116	22-9-2020	10.43a.m	78.9	85	70
Receptor 1–Mabibo market –point 1: 37M 0524777 UTM 9248194	21-9-2020	01.43p.m	88	85	70
Mabibo market point 2: 37m 0524746 UTM 9248233	21-9-2020	01.50p.m	83.1	85	70
Mabibo market point 1 37M 0524777 UTM 9248194	22-9-2020	11.10a.m	85.3	85	70
Mabibo market point 2 37m 0524746 UTM 9248233	22-9-2020	11.18 a.m	73.05	85	70
Receptor 2 NIT –Point 1: 37M 0524698 9248104	21-9-2020	12.43p.m	77.8	85	70
NIT –Point 2: 37M 0524772 UTM 9248092	21-9-2020	12.59p.m	79.9	85	70

NIT –Point 1: 37M 0524698 9248104	22-9-2020	11.35p.m	78.65	85	70
NIT –Point 2: 37M 0524698 UTM 9248104	22-9-2020	11.48p.m	84.6	85	70
Receptor 3: Garage area point 1 37M 0524891 UTM 9248086	21-9-2020	12.16p.m	77.8	85	70
Garage area point 2: 37 M0524977 UTM 9248057	21-9-2020	12.27p.m	73.3	85	70
Garage area point 1: 37M 0524891 UTM 9248086	22-9-2020	10.56a.m	86.4	85	70
Garage point 2: 37 M 0524977 9248057	22-9-2020	11.00 a.m	81.5	85	70
Way leave area point 1 37M 0524619 UTM 9248222	21-9-2020	11.27a.m	68.5	85	70
Way leave point area point 2 37M 0524417 UTM 9248269	21-9-2020	11.49p.m	72.05	85	70
Way leave area point 1 37M 0524619 UTM 9248222	22-9-2020	10.21a.m	73.4	85	70
Way leave area point 2 37M 0524417 UTM 9248269	22-9-2020	10.28a.m	78.05	85	70

Source: Site measurement, EARG, 2020

Vibration Measurement

Vibration levels were measured using digital Vibration Meter PCE-VT 1100 (Photo 3). The vibration meter is hand-held measuring device for the individual assessment of vibrations on machines and systems. The device meter measure ground vibration. Vibration measurement were conducted between 09:00 AM and 6:00 PM for two days consecutive and time constant for 10 seconds.

Photo 3: PCE vibration measurement instrument

Vibration levels within the proposed project were measured at the substation (three point at the substation), and at receptor of the substation (National Institute of Transport, Mabibo Market, Garage area and Way leave), also in the receptor two point in the different location was taken. The average collected vibration levels were compared with national standard set by Tanzania Bureau of Standard (TBS) as shown in Table 4. Maximum vibration level at the substation at the receptors was 1.0 m/s^2 and minimum noise level was 1.0 m/s^2, this result it significantly below the recommended Tanzania standard set by Tanzania bureau of standard (TBS) of 1.15m/.

Table 4: Result of Vibration measurement at substation and it receptor (NIT, Mabibo market, Garage, way leave)

Location	Date	Time	Vibration (M/S^2)	National Standards (TBS) (M/S^2)
Substation point 1 37M 0524762 UTM 9248138	21-9-2020	11.13A.m	1.0	1.15
Substation Point 2 37M 0524721 UTM 9248154	21-9-2020	11.21a.m	1.0	1.15
Substation point 3 37M 0524822 UTM 9248116	21-9-2020	12.00p.m	1.0	1.15
Substation point 1 37M 0524762 UTM 9248138	22-9-2020	10.04a.m	1.0	1.15
Substation point 2 37M 0524721 UTM 9248154	22-9-2020	10.07a.m	1.0	1.15
Substation point 3 37M 0524822 UTM 9248116	22-9-2020	10.43a.m	1.0	1.15
Receptor 1–Mabibo market – point 1 37M 0524777 UTM 9248194	21-9-2020	01.43p.m	1.0	1.15
Mabibo market point 2 37m 0524746 UTM 9248233	21-9-2020	01.50p.m	1.0	1.15
Mabibo market point 1 37M 0524777 UTM 9248194	22-9-2020	11.10a.m	1.0	1.15
Mabibo market point 2 37m 0524746 UTM 9248233	22-9-2020	11.18 a.m	1.0	1.15
Receptor 2 NIT –Point 1 37M 0524698 9248104	21-9-2020	12.43p.m	1.0	1.15
NIT –Point 2 37M 0524772 UTM 9248092	21-9-2020	12.59p.m	1.0	1.15
NIT –Point 1 37M 0524698 9248104	22-9-2020	11.35p.m	1.0	1.15
NIT –Point 2 37M 0524698 UTM 9248104	22-9-2020	11.48p.m	1.0	1.15
Receptor 3	21-9-2020	12.16p.m	1.0	1.15

Garage area point 1 37M 0524891 UTM 9248086				
Garage area point 2 37 M0524977 UTM 9248057	21-9-2020	12.27p.m	1.0	1.15
Garage area point 1 37M 0524891 UTM 9248086	22-9-2020	10.56a.m	1.0	1.15
Garage point 2 37 M 0524977 9248057	22-9-2020	11.00 a.m	1.0	1.15
Way leave area point 1 37M 0524619 UTM 9248222	21-9-2020	11.27a.m	1.0	1.15
Way leave point area point 2 37M 0524417 UTM 9248269	21-9-2020	11.49p.m	1.0	1.15
Way leave area point 1 37M 0524619 UTM 9248222	22-9-2020	10.21a.m	1.0	1.15
Way leave area point 2 37M 0524417 UTM 9248269	22-9-2020	10.28a.m	1.0	1.15

(Source: Site measurement, EARG, 2020)

4.1.6 Water quality

In Dar es Salaam, domestic waste is the most serious source of pollution. The waste generated by 15% of the city residents who are connected to the sewer system is discharged into the sea untreated. As a result, coastal waters, especially in the vicinity of the Dar es Salaam harbor, arc heavily polluted. Discharge of untreated sewage in Dar es Salaam has resulted in high faecal and total coliform levels in coastal waters. The situation is made worse by a broken sewer pipe, which discharges untreated sewage on sandy-mud flats near the harbor and is said to threaten invertebrates and fish. It has also been reported that chlorinated organic compounds are present at alarming levels in the harbor areas as are heavy metals, e.g. Pb, Zn and Cu (2). For many years, the harbor area suffered from oil pollution from the refinery at Kigamboni, and industrial wastes from Keko, Chang'ombe, Kurasini, Mtoni, and Temeke. These discharge heavy metal, pesticide, organic, and paint wastes into the nearby area (35). However, the refinery has now ceased operation. Msimbazi River and Creek are also among the most polluted waterbodies in Dar es Salaam. The river and creek receive large quantities of untreated domestic wastes from

the city's residents in addition to industrial wastes from various industries. The river and creek receive such pollutants as dyes and paint wastes and strong alkalis (from textile factories), oil, and tars, (from vehicle depots and power stations), organic wastes (from breweries and meat plants). Other industrial and agricultural chemicals that pollute the river and creek include heavy metals, PCBs, cyanides, pesticides, and detergents. Table 5 and 6 give pollution loads in surface and ground water sources respectively in Dar es Salaam.

Table 5: Pollution load to surface water resources (kg day') in Dar es Salaam.

Type	Industrial effluent	Pit latrines	Septic tanks	Without facilities	Total
BOD	28330	15282	3275	9897	56784
COD	29904	16131	3457	10447	49776
Suspended solids	47216	25 470	5458	16495	78429
Dissolved solids	83940	45280	9830	29325	138923
Total N	4145	2236	479	1448	6859
Total P	787	425	91	275	1302

Source: Sustainable Development Programme (1992)

Table 6: Pollution loads to groundwater sources (kg day-1) in Dar es Salaam.

Type	No facility	Pit latrines	Septic tanks	Sewer domestic	Losses industry	Total (tons)
BOD	1100	15282	7641	1221	1899	27
COD	1161	16131	8068	1289	11994	29
Suspended solids	1833	6116	3832	2035	3148	18
Dissolved solids	3258	97 857	61128	3618	5596	196
Total N	120	4829	3018	3618	5596	10
Total P	23	915	572	34	52	2

Source: Sustainable Development Programme (1992)

The safety of water from shallow wells is questionable. Thomas, (2011) found out that groundwater (deep and shallow wells) at Ukonga Dar es Salaam, has been contaminated with bacteria, chloride, nitrate and fluoride. These sources may be contaminated due to infiltration of sewage from pit latrines or septic tanks and/or wash-down of contaminated soil by surface run off. Another source of contamination can be the soil because it can consists of a mixture of weathered minerals and varying amounts of organic matter (Saria, 2011a). Also, soils can be

contaminated as a result of spills or direct contact with contaminated waste streams such as airborne emissions, process solid wastes, sludges, or leachate from waste materials. The solubility of metals in soil is influenced by the chemistry of the soil and groundwater (Evans, 1989). Lifting device can push down soils and rubbish during water collection and spilled water running back into the sources again leads to pollution. The use of contaminated drinking water constitutes a serious health risk and can result in outbreaks of water borne diseases like dysentery, cholera and typhoid (Madavine, 2008).

4.1.7 Water Resources

Dar es Salaam lies within an increasingly water scarce catchment. Figure 7 shows the vegetation and main surface water drainage areas in the city. They include Ng'ombe (Sinza) River in Kinondoni; Kizinga River, Yombo River and Gerezani Creek in Temeke; and Msimbazi River and Yombo river in Ilala. Almost all these rivers and creeks are largely seasonal which have not been gauged, tending to flood during the wet season and dry up in the dry season. None of these rivers is gauged therefore information on hydrological flow is absent. There are small streams and one big river (Mbezi River) crossing the project area in several locations. Since the project in question is a transmission line the issues related to surface water body /rivers is largely pollution resulting from sediment load emanating from construction works.

4.2 Socio-economic information

4.2.1 Administrative Structure and Boundaries

Dar es Salaam city is located within the Dar es Salaam region, one of thirty regions in Tanzania. The city is subdivided into five municipalities of Ilala, Kinondoni, Temeke, Ubungo and Kigamboni, and 102 wards as shown in Table 7 and Figure 10.

Table 7: Number of Divisions, Wards, Mtaa, Villages and Hamlets in the Three Municipalities of Dar es Salaam

Municipality	Division	Wards	Streets
Ilala	3	36	159
Temeke	2	23	142
Kinondoni	2	20	106
Ubungo	2	14	91
Kigamboni	1	9	67

Total	**10**	**102**	**565**

Source: Kinondoni, Ilala, Temeke, Ubungo and Kigamboni Municipal Council Profiles 2017

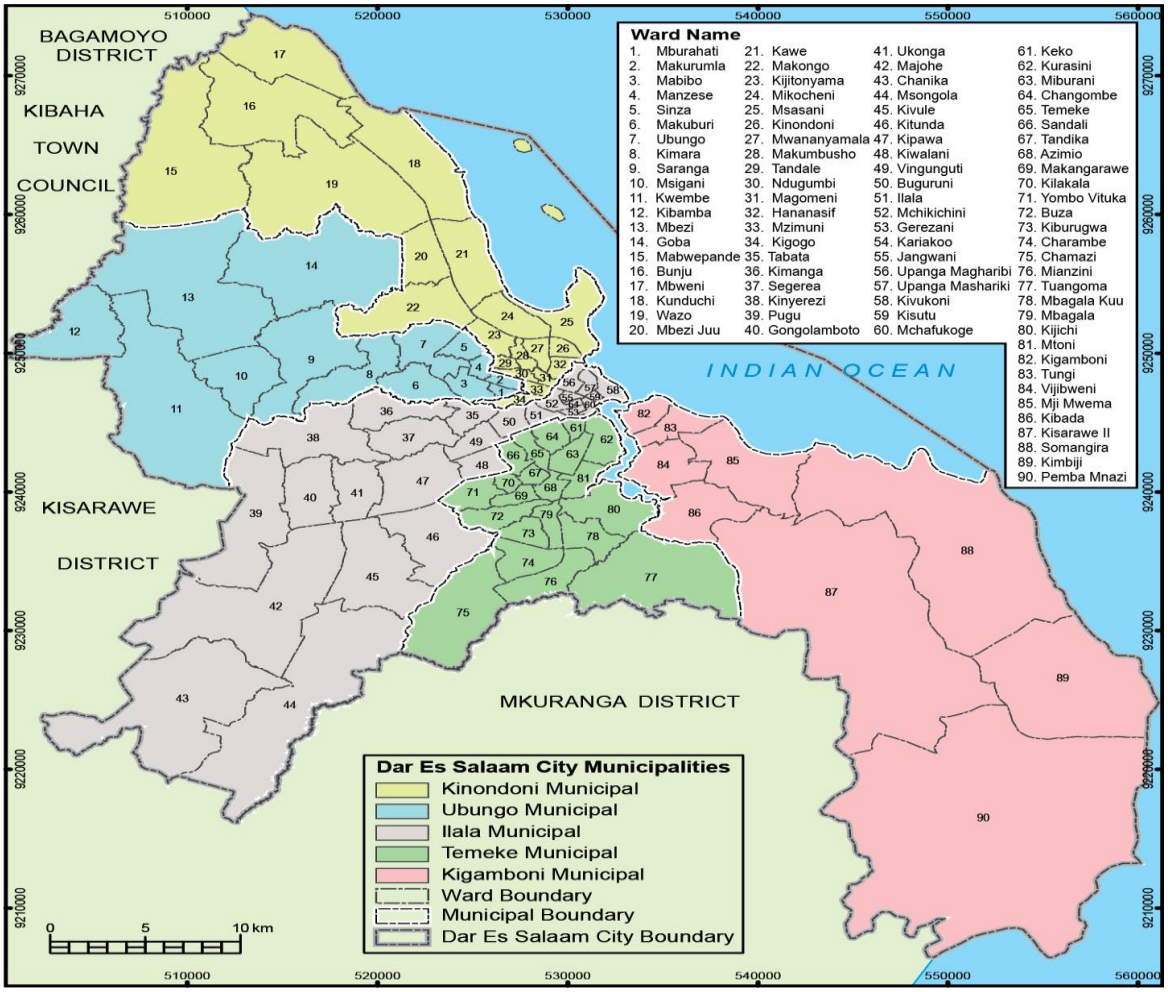

Figure 9: Administrative Boundary of Dar es Salaam City

Dar es Salaam is administered through the regional and city council bodies. Firstly, Dar es Salaam's regional administration is headed by a Regional Commissioner. In Tanzania, the region is in charge of overseeing the city. Secondly, Dar es Salaam has a City Council administration, officially headed by Mayor. The Mayor remains more of a political title working through elected constituencies. The Councilors and Mayors serve for five-year terms, whereas Deputy Mayors are elected every year from among the councilors. The incumbent can be re-elected many times, depending on the will of the councilors. There are eight electoral constituencies in Dar es Salaam, each with an elected Member of Parliament. The Dar-es-Salaam City Council and five municipalities operate in the same jurisdictional areas, but each of the Municipal Councils has

been given a jurisdiction area demarcated with an administrative structure governing the municipality. The functions of the City Council and the five Municipal Councils (MCs) are provided for in Section 7A of Act No. 8 of 1982. Table 2.5 showcases the political party affiliations across Dar es Salaam's municipal councils and constituencies.

4.2.2 Demographic Characteristics

Based on Tanzania population and Housing census of 2012, Ubungo Municipal Council had a population of 845,368. Among the population, 409,149 were males and 436,219 were females. Based on the population projection for 2019, Ubungo municipal council had a population of 1,403,311, among them, 679,185 were males and 724,126 were females. The municipal population annual growth rate stood at 5.0 percent which is slightly lower than the regional population annual growth rates of 5.6 percent and significantly higher than the national population annual growth which stood at 2.4 percent. The council has an average household size of 4.0 similar to the regional average household size. The high annual growth rate for the Ubungo municipality is likely to be associated with high rate of migration as well as natural population increase. The population distribution in project-affected wards varies from one ward to another as shown in Table 8.

Table 8: Population distribution in Ubungo Municipality

S/N	WARD	POPULATION BY SEX 2012			POPULATION BY SEX 2017		
		MALE	FE	TOTAL	MALE	FE	TOTAL
1	Mburahati	16,784	17,339	34,123	21,421	22,129	43,550
2	Sinza	18,892	21,654	40,546	24,112	27,637	51,749
3	Makuburi	28,021	29,387	57,408	35,763	37,506	73,269
4	Mabibo	41,824	43,911	85,735	53,379	56,043	109,422
5	Manzese	34,495	36,012	70,507	44,025	45,961	89,986
6	Ubungo	27,221	28,794	56,015	34,742	36,749	71,491
7	Makurumla	30,933	32,419	63,352	39,479	41,376	80,855
8	Mbezi	35,637	37,777	73,414	45,483	48,214	93,697
9	Msigani	26,479	28,632	55,111	33,795	36,542	70,337
10	Kimara	36,654	39,923	76,577	46,781	50,953	97,734
11	Saranga	49,263	54,864	104,127	62,873	70,022	132,895
12	Goba	21,066	21,603	42,669	26,886	27,572	54,458
13	Kibamba	13,840	15,045	28,885	17,664	19,202	36,866
14	Kwembe	28,040	28,859	56,899	35,787	36,832	72,619
	TOTAL	**409,149**	**436,219**	**845,368**	**522,190**	**556,738**	**1,078,928**

Source: URT, 2012. Tanzania Population and Housing Census, National Bureau of Statistics

Population densities in the Municipality vary from one settlement to settlement. High populated areas are found in unplanned settlements such as the Manzese and Mabibo wards with a population density of 38,465/km²and 21,258/km². Low population densities are in peripheral localities such as the Kibamba and Msigani wards with a population density of 1,468/km² and 3,765/km² respectively. Other affected wards are moderately populated, for instance, Ubungo ward has a population density of 5,604/km², Kimara has 5,664/km² and Makuburi has a population density of 7,527/km². The impact of higher population densities always is associated with widespread of poverty and other serious environmental and social problems such as crimes, poor hygiene, leading to unsustainable development.

4.2.3 Social services

4.2.2.1 Education system in Tanzania

The Tanzania education system is based around a 2-7-4-2-3+ structure. In other words: 2 years of pre-primary school, 7 years of primary school, 4 years of ordinary secondary school (ordinary level), 2 years of advanced secondary school (advanced level) and at least 3 years of higher education. The Ministry of Education, Science and Technology has general responsibility for the education system. Amongst other aspects, the Ministry is charged with quality assurance, research, monitoring and evaluation of primary and secondary education. In addition to the Ministry, various other parties are involved in the governance and monitoring of education services, such as the Prime Minister's Office, the Regional Administration and Local Government, various NGOs and individuals coordinated by the central government.

The Ministry is also responsible for higher education at universities. Public universities are semi-autonomous and have the freedom to determine – amongst other aspects – their own curricula. They are also authorized to award academic degrees. Although the vice-Chancellor of the university is appointed by the institution itself, the Chancellor is appointed by the President of Tanzania. All universities, both public and private, operate under the supervision of the Tanzania Commission for Universities (TCU). The National Council for Technical Education (NACTE) is responsible for all technical and vocationally oriented secondary and higher education offered at non-university institutions. Compulsory education in Tanzania starts at the age of 7 and ends at

age 14. The language of instruction for primary education is Kiswahili. However, the language of instruction for both secondary and higher education is English.

4.2.2.2 Education in Ubungo municipality

Ubungo Municipal Council has 113 Pre -Primary Schools out of which 60 belongs to Government and 53 owned by private sector. Also District Council has 118 Primary schools, whereby 64 are owned by Government and 54 primary Schools owned by Private Sector. All 64 Primary Schools has a total number of 76,346 pupils from STD I to STD VII and 2,434 teachers. The present school infrastructures include 833 classrooms, 17,121 desks, 710 pit latrines, 8 libraries and 112 staff. In terms of secondary schols, the council has a total number of 66 secondary schools, out of which 27 are registered community secondary schools and 39 are privately owned. In addition to that, 11 out of 39 private Secondary Schools are at Advanced Level. Nevertheless, the Council is trying to work on the necessary infrastructure for A-Level at Kiluvya, and Y. R. Makamba for increasing the number Advanced level schools All 27 Community Secondary Schools had a total number of 22,930 students from form I - IV and 955 teachers. Private schools have the total number 10,849 students from I-VI. Among the public secondary schools five are located in within the project wards.

4.2.2.3 Health services and facilities

The Council currently has a total of 68 health facilities of which 17 are government owned, while the remaining 51 are owned by Private Organizations. Sinza hospital is the only hospital owned by the government providing health services within the Municipal. This hospital is called a district hospital, which is providing services for 1,000 to 1,500 in and out patients per day. All the health facilities provide cure, preventions of communicable and non-communicable Diseases. Table 9, shows a list of health facilities available in Ubungo Municipal Council.

Table 9: Health facilities in Ubungo Municipality

Health Facility Level	Government	Private	Total
Hospital	1	5	6
Health Centres	3	7	10
Dispensaries	15	74	89
Clinics			11
Total	**17**	**51**	**116**

Source: Ubungo Municipal Council Strategic Plan (2018/2019-2022/2023)

Water borne diseases are the leading cause of mortality, these are Typhoid and Cholera. The main challenge is low coverage of safe and clean water system, lack of modern toilets and community health illiteracy.

4.2.2.4 HIV/AIDS Situation

Despite the government efforts to control the transmission of HIV at different levels in the area, the disease still features among the top ten diseases. Based on TACAIDS report of 2017 on people living with HIV/AIDS, the Ubungo municipality reported to a significant number of people living with HIV/AIDS as shown in Table 10.

Table 10: People Living with HIV in Dar es Salaam Municipalities

Municipal	Male	Female	Total
Temeke dc	5,250	7,958	13,208
Ilala	4,028	6,940	10,968
Kinondoni	5,951	7,798	13,749
Ubungo	3,558	4,862	8,420
Kigamboni	3,210	5,260	8,470
Total	**21,997**	**32,818**	**54,815**

Source: The United Republic of Tanzania: Prime Minister's Office, Tanzania Commission for Aids. National HIV and AIDS Response Report for 2017. Tanzania Mainland, June 2017

4.2.2.5 Gender issues and people with vulnerability

Gender differences are a significant attribute in agriculture, from access, control and ownership of land to marketing of raw and processed produce. In Tanzania, despite constitutional proclamations of gender equality and many laws that promote equal opportunities for both men and women, still related issues has remained to critical problem in the communities.

Based on this fact the Ubungo Municipal Council through the department of health is responsible for gender issues and providing support to vulnerable people. The Social Welfare Unit is responsible for offering services to vulnerable populations in communities or in institutions through provision of Child and Women protection services and supervision of other welfare services. The Social Welfare Unit is dealing with Maintenance services to ensure welfare of vulnerable groups is maintained**.** Table 11, shows the number of vulnerable people and Gender related issues in Ubungo municipality**.**

Table 11: Elders, People with Disabilities and Elders with medical exemption cards and vulnerable group beneficiaries

Vulnerable group beneficiaries	Estimated number of beneficiaries	Identified beneficiaries	Percentage (%)
Elders	15,987	7,299	56.1
People With Disabilities (PWDs)	700	673	96.1
Elders who provided medical exemption cards	7299	8971	123
Total	**16,687**	**7,972**	
The number of GBV&VAC cases attended (2016/17- 2017/18)			
Type of case	**Children**	**Adult**	**Total**
GBV & VAC cases	61	557	618
Children in conflict with the Law (CICL)	09	-	09
Total	**70**	**557**	**627**

Source: Ubungo Municipal Council Strategic Plan (2018/2019-2022/2023)

4.2.2.6 Road Network

Ubungo district Council has a total of 386.3 km of roads which are maintained by the Council out of which 23.0 km are tarmac roads, 245.25 km are gravel roads and 118.05 km are earth roads and 78 bridges/box culverts. The status condition of the entire network is as shown on Table 12.

Table 12: Road network in Ubungo Municipal Council

Paved			Gravel			Earth		
Good	**Fair**	**Poor**	**Good**	**Fair**	**Poor**	**Good**	**Fair**	**Poor**
19.25	0.0	3.75	82.85	107.45	54.95	10.9	46.3	60.85
23.0			**245.25**			**118.05**		
Total Length 386.3 Km								

Source: Ubungo Socio-economic profile, 2016

Ubungo Municipal Council is continuing to conduct rehabilitation, maintenance, upgrading and construction of roads and bridges/box culverts to improve its roads network within district specifically by focusing routes which are decongesting traffic from main roads and routes accessing to services areas by using funds from Road Funds Board, own source and from other

sources. Despite the efforts to rehabilitate the road infrastructure, it was observed that most of the access road to the existing transmission line, especially during rainy season are in poor condition which makes difficult to access the transmission.

4.2.2.5 Water and Sanitation

The main source of water for Ubungo residents is from Lower and Upper Ruvu, which managed by Dar-es-salaam Water and Sewerage Authority (DAWASA). The water from DAWASA systems contributes 68% of water being consumed daily and the rest is contributed by shallow and deep wells, which owned by both private and community. The estimated population of Ubungo Municipality is 845,368 out of that only 68% have direct access to clean and safe water while the rest 32% have no smooth access. Under WSDP - RWSSP the Council has drill 17 boreholes in which 4 borehole are dry among 17. Water supply system for two bore of Mpiji Magohe and Kibwegere has been under construction.

4.2.2.6 Solid Waste Management in Dar es Salaam and Ubungo Municipality

Waste management is a growing problem in the whole country. Increasing urbanization, rural to urban migration, and rapid development associated with population growth have resulted in increased solid and liquid waste generation mainly by industrial and domestic activities. There is limited data available on waste management for the country. Table 13 shows the generation of waste by source in DSM. From the table it can be seen that most of the waste are generated from manufacturing followed by households.

Table 13: Generation of Waste by Source in DSM from 2012-2014

Source	Unit in Tones		
	2012	2013	2014
Agriculture, forestry and fishing	111,164.40	138,681.75	125,592.12
Mining and quarrying	71,407.69	57,104.25	80,675.49
Manufacturing	540,382.50	432,360.75	610,517.25
Energy	63,687.94	89,735.25	71,953.82
Construction	57,126.15	73,419.75	64,540.40
Other activities	185,274.00	244,732.50	209,320.20
Households	524,943.00	595,515.75	593,073.90

Source: Dar es Salaam City Council, 2015

Ubungo Municipality is estimated to generate about 828 tonnes of waste per day, (which gives 302,001 tonnes per year). Waste generation sources in the Municipality with respective tonnes generated in brackets are. The source and amount of wastes generated in Ubungo municipal council is shown in Table 14.

Table 14: Generation of Waste by Source in Ubungo Municipal Council in 2017

Source	Unit in Tones
Households	661
Institutional waste	6.5
Commercial waste	12.4
Market waste	16.5
Informal sector waste	131.6
Total	828

Source: Socio-economic Profile - Ubungo Municipal Council, 2017

Solid waste collection in Ubungo Municipality is carried out by both the Municipal, some private companies, community based organizations and informal sectors. Apart from collection activities, the Municipality is also responsible for supervising the franchisees involved in Solid Waste Management. Various service providers are engaging in solid waste management. There are 19 Mitaa with contactors, 20 Mitaa with community groups, 36 mitaa served by Mtaa Government 36. There are 19 Mitaa without service providers. In regard to waste transportation, both the Municipal council and private sectors do transportation of solid waste. The Municipal council has four trucks of which only one is functioning for transportation of solid waste from different areas of the Municipal to the current dump site. The site is situated more than 35 Km from the Centre of Ubungo municipality, this makes the round trip to cover about 80Km. Other trucks are owned by the private sectors including contractors, Community groups and NGO's. The department is faced with various challenges including: lack of equipment to quantify levels of pollution; insufficient waste management facilities; long distance to the dump site; inappropriate negative community perception toward waste management practices; pollution done during night; petty trade activities contributing to environmental pollution; and sand mining activities in rivers.

4.2.2.6 Energy

Dar es Salaam city dwellers including Ubungo municipality depend on different sources of energy such as electricity, charcoal, firewood and gas, also stand-by generators are used during

power outages. The main source of power for lighting, business and industry is electricity, which is generated, transmitted and supplied by a sole power utility, Tanzania Electric Supply Company Limited (TANESCO). Residents commonly use electricity, charcoal, gas for cooking and lighting. A large number of service outlets use charcoal and gas for cooking, some use kerosene stoves.

4.2.4 Economic Activities

4.2.4.1 Land use in Dar es Salaam

With its highly urbanized spaces, currently, the major land uses in Dar es Salaam include the residents of both formal and informal; institutional, industrial, agriculture, hazardous land and open spaces. Literature shows that up to 1963, most of the urban land uses in Dar es Salaam were planned, except a few informally developed settlements of Keko, Buguruni, Ubungo, and Temeke. Spatially the extent of the land use development was confined to within a radius of 6 kms. In the post-independence period, however, rapid horizontal expansion of the city occurred, predominantly along its radial road networks fueled by rapid population influx and individual's development of houses by the city residents. By 1978, the land use coverage of the city had extended to 14 kms along Pugu road extending as far as Ukonga, about 12km along Morogoro and Bagamoyo roads thereby engulfing the suburbs of Kimara and Kawe respectively.

The southern extension along Kilwa road was rather limited to about six kms extending to the present settlements of Temeke and Chang'ombe. Although pockets of land remained undeveloped between these arterial roads, the extent of the builtup areas of the city was generally limited to within the 12-kilometer radius. By 1992, the extent of the land use coverage predominantly remained within the 12-kilometer radius but with extended development along Bagamoyo road including settlements of Mbezi and Tegeta up to 16 km and ten km along Kilwa road including settlements of Mbagala and Mtoni. In the year 2012, the extent of the land use coverage shows consolidation of settlements on the formerly sparsely developed areas between the major roads and further extended growth along these roads. The northern extension along Bagamoyo road had reached about 32kms, about 30kms westwards along Morogoro road, about 25kms south-westwards along Nyerere road and 20kms southwards along Kilwa road. In essence, one cannot tell the boundary of the city while riding/driving along the major roads

because of the continuous development therein. The land use in the project area is also dominated by settlements with small businesses such as shops and restaurants. Since the project will be implemented using the existing way leave, no significant impacts are expected to the settlements and the businesses.

4.2.4.2 Urban Agriculture

About 1,850.(Ha) of land in the Municipality are potential for agricultural practices especially crop cultivation (Though the figure might differ due to rapid expansion of urban related activities). Land estimated under use for both cash crops and food crops is 174.94 (Ha); approximately 9.45% of land is potential for agriculture. Farmers engage in small and large farming, and they mostly till their land using hand equipments . Few of them use tractors and traditional upgraded technology. Agriculture provides the Municipality with 1,007.54tones of **f**ood crops, which is only 0.65% of the total annual food requirement of the population. Table 15 and Photo 1, shows the various types of crops grown in Ubungo municipality, particularly along the proposed transmission line.

Table 15: Estimated quantity of vegetable crops produced in kilogram (kg)

Type of vegetable	**2012**	**2013**	**2014**	**2015**	**2016**	**Total**
Amaranth	5,033	5,776	6,111	6,500	7,512	30,932
Pumpkin	7,800	9,550	9,998	11,020	11,579	49,947
Chinese Cabbage	4,540	5,750	5,991	7,975	6,352	30,608
Spinach	579	631	673	751	796	3,430
Pepper	1,151	1,250	1,375	1,750	1,811	7,337
Tomatoes	6,720	7,100	7,550	7,600	7,965	36,935
Salad	2,450	2,785	3,050	3,405	3,784	15,474
Okra	490	575	750	870	955	3,640
Legumes leaves	14,050	16,800	17,505	18,500	18,955	85,810
Total	**42,813**	**50,217**	**53,003**	**58,371**	**59,709**	**264,113**

Source: Bishoge, O. K. et al, 2018

Photo 4: Banana crops along the transmission line at Kimara ward in Ubungo Municipal
Source: *EARG Study Team, 2020*

4.2.4.2 Industries

Industrialization on small and large scales is a common feature in the Municipality. Small-scale industry concentrates in domestic production sectors scattered throughout the Municipal and allocated mostly in residential areas. Individuals and groups of Tanzanians are engaged in production of a wide range of goods in this sector. Large-scale industries are located in the designated industrial areas of Ubungo, Mabibo and Makuburi.

4.2.4.3 Other Land Uses

Apart from the mentioned economic activities, the Ubungo Municipality is dominated by human settlements of which some located within the wayleave of the proposed power transmission line at Ubungo ward, institutional land, commercial land, land for transport and communication. Urban agriculture is also taking place in some areas including along the power transmission line. There are also small businesses, garage and grave yards as shown in the following photo 2, 3 and 4 with their coordinates in Table 16.

Photo 5: Some of the permanent and temporal structures to be affected at Ubungo ward

Photo 6: Garage in Ubungo Kisiwani and Grave yard in Mavurunza located within the way leave of the Power Transmission line in Ubungo and Kimara wards.
Source: EARG Study Team, 2020

Table 16: Location of properties along the proposed transmission line

S/N	Easting	Northing	Altitude	Remarks
1	0517895	9247798	125	Graveyards at Mavurunza in Kimara ward
8	0522765	9248896	56	Potential house for relocation at Kibo in Ubungo ward
9	0522805	9248899	56	Potential house for relocation at Kibo in Ubungo ward
10	0522854	9248888	56	Potential house for relocation at Kibo in Ubungo ward

Source: ***EARG Study Team, 2020***

4.3 Socioeconomic Information and Profile of Project Affected Persons (PAPs)

4.3.1 Age and sex

The household survey revealed that the significant number of the respondents were female, accounting for 53.8% (8) of the PAPs whilst the remaining 46.2% were male. The age distribution among the PAPs showed that 23.0% fall within the age group of 24 – 44 years. A relative significant number of the PAPs were in the age group of between 45 – 54 years, 15.4 were in the age group of 55 – 64 as well as those who were above 65 years of age. Figure 11 show the age group distribution among the PAPs along the project area.

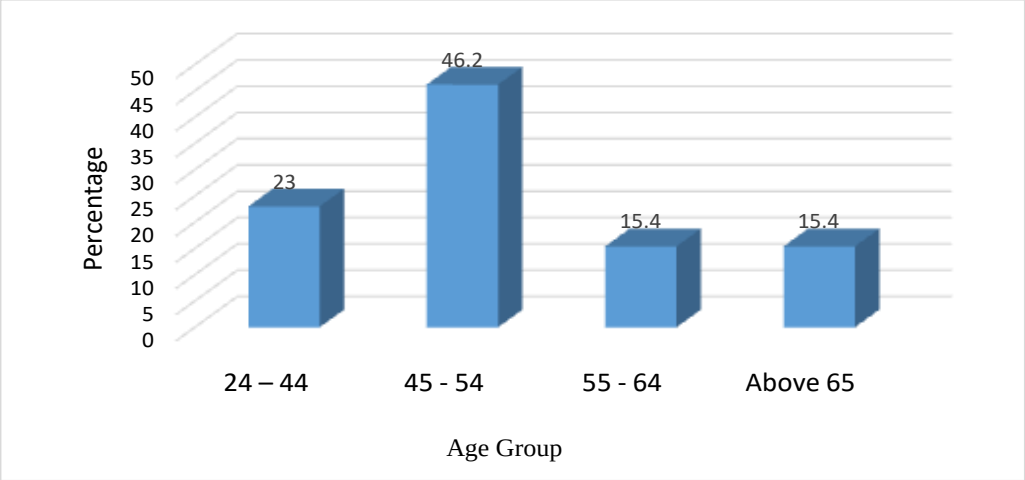

Figure 10: Percent of age-group distribution among the PAPs respondents
Source: *EARG Study Team, 2020*

Based on the age distribution analysis, the majority 84.6% of the PAPs were in the working age group of 24 – 64 years of age while 15.4% belongs to the category of vulnerable group, hence, they will need special attention during the implementation of the ARAP.

4.3.2 Educational background

Education is a major socio-economic variable, which influences nearly every aspect of human life. Education is generally a thriving industry in the study area, like other parts of the country where parents / guardians are constantly struggling to ensure that their family members attain, at least, the minimal level of education. The educational level of the PAPs head of households has attended different levels of education. As shown in Table 17, 53.8% of the PAPs have completed primary school education, 30.8 had attended secondary education and 15.4% had up to college/university level of education.

Table 17: Head of Household's level of Education

Level of education	Frequency	Percentage
Primary school	07	53.8
Secondary school	04	30.8
College – undergraduate	02	15.4
	13	

Source: *EARG Study Team, 2020*

4.3.3 Marital status

Marital status is a very important factor in determining how a person gets affected or become vulnerable to resettlement or relocation. The survey show that 53.8% (7) of the affected persons were married whilst 38.5 (5) of the affected persons are widows. Widows are particularly vulnerable because in African context, men generally control assets and upon death of their husband they are not easily considered as heirs. This group will need special attention and treatment during the implementation of the ARAP. Table 18 show the marital status of the PAPs at Kibo mtaa in Ubungo ward.

Table 18: Marital status of respondents

Marital status	Frequency	Percentage
Married	07	53.8
Widowed	05	38.5
Single	0	0
Separated	01	7.7
Total	13	100

Source: ***EARG Study Team, 2020***

4.3.4 Average Households size

The average household size was 5.5 persons per household. This is a relatively higher than the national, regional and district average household size which stood at of 4.8, 4.0 and 4.0 persons respectively. The largest household size ranged from 7 to 9 people as shown in Table 19.

Table 19: Number of household members

Household size	Frequency	Percentage
2 – 3	3	23.1
4 – 5	3	23.1
6 -9	7	53.8
Total	13	100.0

Source: *EARG Study Team, 2020*

The high number of average household size has implication to the total number of dependants who have been affected by the project. Based on the household survey a total of 72 household members will be affected by the project

4.3.5 Occupation

Occupational pattern is a vital social fact that decides their livelihood pattern of the household. As shown in Figure 12 the respondents were engaged in diverse occupations such as wage employment, petty trader, urban farming, casual labour as well as carpentry and Manson. According to the household survey, about 38.5.0% of the PAPs are government employees as their main occupation. PAPs who depend on petty trade such as small shops, grocery as their primary activities accounted for 30.8% of the PAPs. Those who were involved in agriculture also account for 30.8% of the PAPs. Casual labour accounted for 15.4% and those with other activities such as carpentry and Manson were 30.8% of the PAPs.

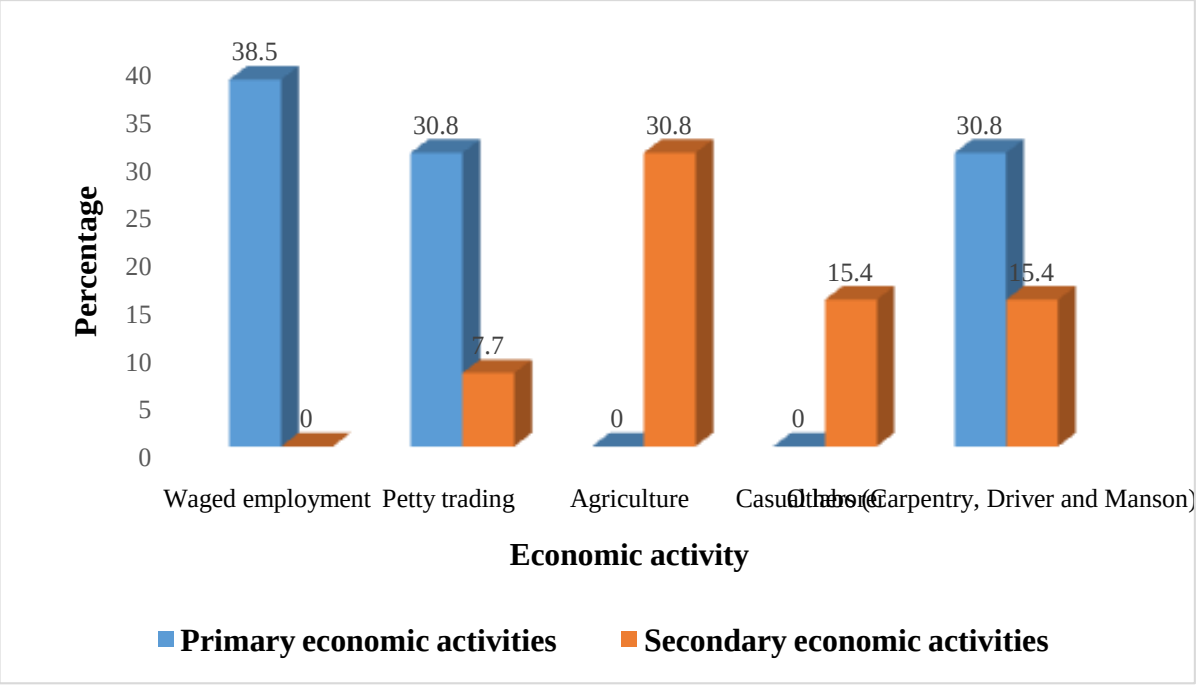

Figure 11: Percent distribution of PAPs occupation
Source: ***EARG Study Team, 2020***

4.3.6 Source of income and Average monthly income

PAPs average monthly income was difficult item to assess because some of them except the government employee do not keep records of what they get from their major sources. Also some of the PAPs were not willing to disclose what exactly they are getting from their business or any activities. However, for those who responded to the question indicated that the average monthly income generated from the major occupations varied widely from below Tshs 180,000 to above 1,500,000. The household's average income is shown in Figure 13.

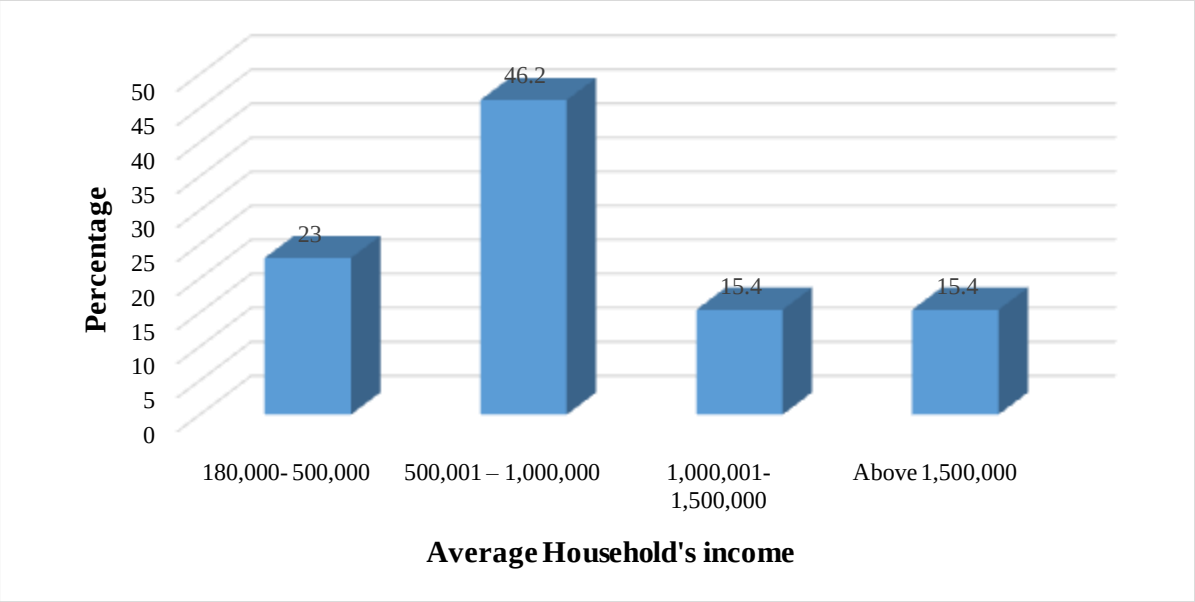

Figure 12: Percent distribution of Average head of household's income
Source: ***EARG Study Team, 2020***

Wage employment was reported to be the major occupation and source of income to significant number of the head of households and followed by other businesses such as drivers, carpentry and masonry.

4.3.7 Type of impacted house structures

The types of houses found in most of urban areas in Tanzania are similar to those found in the project affected area. Most of the houses are modern built with cement floor, corrugated iron sheets and cement blocks. The survey shows that 90% of PAPs houses consist of cement floors, 4.9% with mud floors and 13.4% tiles floor. 96.5% of the houses have corrugated iron sheets, 3.5% have tin and metal roof. Most of the houses owned by PAPs consist 98.8% have cement blocks walls and 2.2% have poles. Number of rooms in PAPs houses varies with most of the

PAPs houses comprises of 2 - 4 rooms (68.8%), 5 - 7 rooms (27.3%) and more than 8 rooms (3.9%).

4.3.8. Domestic assets of the households

The household survey indicated that majority 88% of households had reported to have domestic assets, while 12% of the households reported to have no agricultural assets. For those households with domestic assets, it was further reported that about 84.6% households had mobile phones, 92.3% households had radio, 84.6% households had television, 61.5% households had fridge and no households reported to own bicycle or motorcycle as shown in the Figure 14. Furthermore, most (96%) of the households reported to own between one –three domestic assets while the least (0.5%) of households reported to own more than three household's assets.

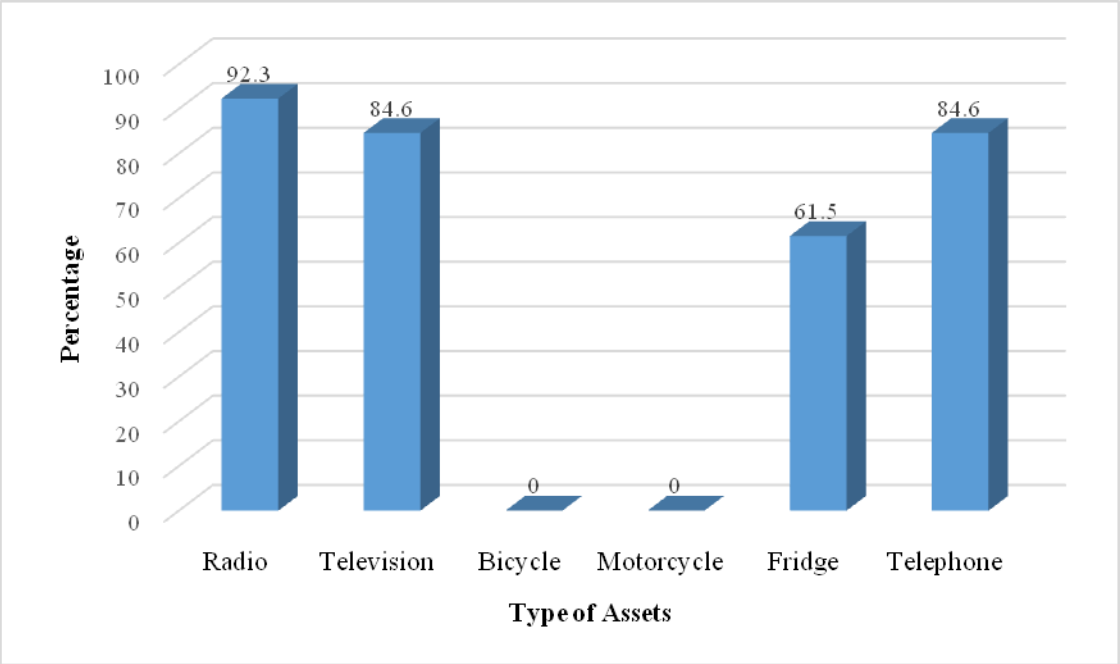

Figure 13: Percent distribution of head of household's asset ownership
Source: ***EARG Study Team, 2020***

4.3.9 Willingness to relocate and Compensation preference

The households affected by the project declared their willingness to relocate should they receive prompt and fairly compensation. Of the Households interviewed indicated their preference of relocating to a site close to their current homesteads, though they are not sure of availability of land within the area or if the compensation provided will allow them such opportunity. When asked if they would want their Municipal Council to find alternative land for the affected PAPs it

was revealed that they will not want alternative land as currently the sites that the Municipals are developing are away from the area they are used to. Therefore, there was no hosting community to be consulted. According to the socio-economic survey conducted in the project area all 13 PAPs interviewed preferred cash compensation instead of in-kind compensation.

4.3.10. Vulnerable People

In this EIA, vulnerable PAPs include elderly people (over 60 years old and widows. Table 20 shows more details about this category of PAPs.

Table 20: List of vulnerable people in the project area

S/n	Type of vulnerability	Number
1	Elders (Above 60 years old) with physical disability (Blind)	03
2	Widow (Female Headed household)	03
3	Elder with physical disability due to stroke – an encroacher at Kilungule A in Kimara ward	01
4	An orphan – owner of the incomplete structure at Kilungule B mtaa in Kimara ward – He is currently living in Iringa	01
	Total	**08**

Source: Source: ***EARG Study Team, 2020***

5.0 THE STAKEHOLDERS AND THEIR ENGAGEMENT

5.1 Introduction

Stakeholder participation was done in accordance to Section 89 of the Environmental Management Act (EMA) No. 20 of 2004 as outlined in Part V of section 17 of the EIA and Audit Regulations (URT, 2005). Subsection (1) stated that, during the EIA process, the developer or proponent shall in consultation with the Council, seek views of any person who is or is likely to be affected by the project/activity; while subsection (2) provides detailed processes and procedures for public/stakeholders participation in the EIA process.

Stakeholder participation in this project included different government institutions, beneficiaries, private sector, individuals, and local communities associated with the project. Views and concerns from stakeholders consulted are reflected in this report and contributes to the identification of impacts as well as mitigation and enhancement measures for the identified impacts

5.2 Objectives of the Public Consultation

The purpose of public consultation during the scoping was to ensure that the views, interests, and concerns of project stakeholders were taken into account in the assessment of the potential impacts of the project as well as in project decisions, particularly in the design of mitigation measures. In addition, the public consultation aims to improve communication between the project and impacted or interested groups. In the course of preparing for stakeholders consultation, the following activities were undertaken:

- Stakeholder identification and analysis;
- Determine the type of consultation activities to be undertaken with each category of stakeholders;
- Information disclosure, specifically the provision of timely and meaningful information that is accessible to all stakeholders;
- Prepare the approach to and mechanisms for obtaining stakeholder feedback on the information disclosed;

- Prepare principles and ground rules guiding consultation with local communities; and the program for consultation to ensure timely notification of consultation activities and to tie in with key stages in the EIA process.

5.3 Stakeholder identification and analysis

The stakeholder identification process for the proposed 220kV transmission line was undertaken through a participatory and transparent process. The stakeholders were chosen based on the social, environmental and economic considerations. Through the stakeholder engagement the EIA team was able to get information to help develop a plan that is tailored to the needs of different stakeholder groups. A number of institutions were consulted in order to seek their input for any requirements and procedures to abide during mobilization, construction and operation of the proposed project. Whereas the local community was involved in order to inform them about the proposed development and get their views and concerns regarding the project prior to commissioning of any field construction work. Other stakeholders will be consulted during full EIA. A list of key stakeholders and their role to the proposed development project is as provided in Table 21.

Table 21: List of stakeholders and their role on the proposed project

Stakeholder Group	Sub-Category	Connection to Project
Ministries/Central Government	Vice President Office-Division of Environment	Mandate for Environment (EIAs) in Tanzania.
	Ministry of Health and Social welfare	Responsible for health-related issues, particularly HIV/AIDs and other communicable disease.
	Ministry of Energy	Responsible for energy related issues
Regional Authority	Dar es Salaam Regional Office	• Administrative region where the project is to be implemented. • Responsible to review investment issues and land in the region.
Municipal Council Authorities	Ubungo Municipal Council	• Assisting with implementation of the project • Assisting with awareness creation to local community. • Monitoring of the project activities.

		• Reviewing land acquisition process.
Government Institutions	National Environment Management Council (NEMC)	• Carry on environmental audit and environmental monitoring • Review and recommend for approval of Environmental and Social Impact Report • Enforce and ensure compliance of the national environmental quality standards • Initiate and evolve procedures and safeguards for the prevention of accidents which may cause environmental degradation and evolve remedial measures where accidents occur;
	Occupational Safety and Health Authority (OSHA)	• Registration of the workplace • Issuance of OSHA Compliance certificate • Inspection on Occupational Safety and Health related aspects. • Enforcement of Occupational Health and Safety Act, 2003 (Act No. 5/2003)
	Tanzania Fire and Rescue Force	• Providing professional services in the area of disaster prevention and taming. • Enhance community safety, quality of life and confidence by minimizing the impact of hazards and emergency incidents on the people, environment and economy of Tanzania.
	Tanzania Electric Supply Company Limited - TANESCO	• Mandated with electricity generation, transmission, distribution, supply, system operation, import and export of electricity and electrical installation. • Ensuring the operating conditions for transmission line
Local and International NGOs	List to be determined during full EIA process	• Interest in land, Health (HIV/AIDs), gender and environment. • Organizations with a direct interest in the initiative might influence it directly or through public opinion. Such organizations often have useful data and insight and may become partners in areas

		of interest.
Local Communities/ Affected Communities	Ubungo, Makuburi, Mabibo and Kimara wards	• Directly impacted by environmental and social effects from the project (both positive and negative)

Source: ***EARG Study Team, 2020***

5.4 Methods of Stakeholder Participation

Various methods were used in ensuring that all relevant stakeholders are consulted and their views incorporated in this report. Participatory methods such as focus group discussion and public meetings were used. The team also visited all critical sites in the proposed project area and conducted discussions with stakeholders on site to identify their views and concerns. Specifically the following methodologies were used in undertaking this exercise include the following:

5.4.1 Household Questionnaires

Household interviews were conducted using structured questionnaires. This technique was used in order to get quantitative information, which could give the general picture of the affected communities or adjacent communities. The types of data obtained by the questionnaires included; house hold location and economic activities of the respondents, land tenure/land use practices, population size, housing condition and size of the land. Therefore, questionnaire interviews were administered in Ubungo ward at Kibo area and Kimara ward at Mavurunza area where some settlements are likely to be re-allocated.

5.4.2 Focus Group Discussion and Checklist

Focused group discussions were conducted in the affected wards and streets using checklists. Ward officials and Mtaa officials in the project area were invited to participate in the group discussion. Efforts were made to ensure most of the affected communities in the area were able to participate. TANESCO representative and local government leaders were invited in the meeting. Also the discussion intends to collect specific data at the mtaa level, discussing about availability of land for relocation and their preferences of where to be relocated in case their structures will be affected .The discussion also focused on identification of sensitive sites/areas such as cultural sites and grave yards that are within the mtaa or its neighbourhood. A checklist

of village social services, economic activities and other infrastructure were also obtained during discussion.

5.4.3 Public Meetings

In order to ensure that the Mtaa are informed of the project, the team conducted public meetings at 7 Mtaas in which the transmission line will traverse. The team made efforts to ensure that women attended and participated in the meetings. The meeting aimed at informing the mtaa about the project and the activities that are associated with the project. Mtaas were also given an opportunity to ask questions, raise their concerns and provide information to the team on issues such as availability of land in the village for resettlement purposes. The public were informed about the meeting through public announcement made by the Mtaa Executive Officers. The list of the meeting participants is shown in Table 22.

Table 22: Number of Mtaas and participant involved in the meetings

S/n	Mtaa name	Male	Female	Total
1	Mavurunza	120	30	150
2	Kilungure A and Kilungule B	32	19	51
3	Baruti	16	14	20
4	Kibo	36	33	69
5	Kisiwani	43	15	58
6	Kibangu	25	16	41
Total		**272**	**127**	**399**

Source: ***EARG Study Team, 2020***

Photo 7: Mtaa public meetings with in the project area
Source: ***EARG Study Team, 2020***

5.5 Identified Key Issues and Concerns

In general, stakeholders had different opinions with regard to the implementation of the proposed 220kV transmission line project. Some of the issues and concerns raised revolve around social and environmental aspects. The issues and concerns raised during the consultations include;

- **Valuation and compensation issues**

The issue of fair and timely compensation was also raised during the consultation. Stakeholders complained that it is taking long time for the compensation to be paid to the affected people after the completion of the valuation process. Stakeholders at Kibo mtaa reported that the valuation of properties in the area was done since 2013 but no compensation has been paid so far. They complained that they have been living in a difficult environment since the valuation has taken place because they are not allowed to do any improvement in their houses as any modification after the valuation will not be considered for compensation. Stakeholders raised concern that in most cases local communities are not well informed of their rights, leave alone the compensation procedure as a result people are denied of their rights.

- **Accident, risks and Hazards**

Accidents and risks may occur to workers during construction phase especially when handling of machinery and equipment. The communities in the project area are very concerned about the safety risks associated with construction of the power transmission line, which will involve high-tension electricity, movement of tracks carrying construction equipment and existence of substations around Mabibo area. The contractor will have to be sensitive of this issue during mobilization and construction and mitigation measures associated with the raised concerns should be implemented.

- **Noise and Dust emission**

Local communities were concerned that development of the project especially during mobilization and construction phases; project activities will generate noise and dust. This may affect the health of the workers and the people in surrounding areas. The communities recommended contractor to dampen the ground during construction in order to avoid or reduce dust emission.

- **Encroachments of TANESCO way leave**

During the field survey, it was revealed that some business and settlement structures were located within the existing way leave of TANESCO in Ubungo and Kimara wards. During discussion with community and local government officials, they admitted that they are utilizing the TANESCO Way leave for various activities illegally and therefore, they expressed their willing to vacate the area before the commencement of the project. Those who are engaged with

vehicle maintenance at Ubungo Kisiwani were concerned with the possibility of getting alternative areas for their activities since they are solely relying on these areas for their livelihoods. The summary of stakeholder's views, concerns and the responses are provided in annex 10.

6.0 IMPACT ASSESSMENT AND ANALYSIS OF ALTERNATIVES

This chapter describes the potential environmental and social impacts of the proposed transmission line system. It assesses how the project will interact with elements of the physical, ecological, social, cultural or human environment to produce impacts to resources/receptors, and the mitigation measures to the potential negative impacts. The potential environmental and social impacts due to the project activities are considered in the stages of the construction phase and the operation phase.

6.1 Impact Assessment Methodology

Impact identification and assessment starts with scoping and continues through the remainder of the EIA Process.

- **Impact Prediction:** to determine what could potentially happen to resources/receptors as a consequence of the Project and its associated activities;

- **Impact Evaluation:** to evaluate the significance of the predicted impacts by considering their magnitude and likelihood of occurrence, and the sensitivity, value and/or importance of the affected resource/receptor

6.2 Impact Prediction

The terminology and designations used to describe impact characteristics are shown in Table 23

Table 23: Terminology and designations for impact characteristics

Characteristic	Definition	Designation
Type	A descriptor indicating the relationship of the potential impact to the Project (in terms of cause and effect).	Direct Indirect Induced
Extent	The "reach" of the potential impact (e.g., confined to a small area around the Project Footprint, projected for several kilometres, etc.).	Local Regional International
Duration	The time period over which a resource /receptor is potentially affected.	Temporary Short-term Long-term
Scale	The size of the potential impact (e.g., the size of the area with the potential to be damaged or impacted, the fraction of a resource that could potentially be lost or affected, etc.).	[No fixed designations; intended to be a numerical value or a qualitative description of intensity]

Frequency	A measure of the constancy or periodicity of the potential impact.	[No fixed designations; intended to be a numerical value or a qualitative description]

The definitions for the type designations are shown in Table 24.

Table 24: Type of Impact

Type	Definition
Direct	Potential impacts that result from a direct interaction between the Project and a resource/receptor (e.g., between occupation of a plot of land and the habitats which are affected).
Indirect	Potential impacts that follow on from the direct interactions between the Project and its environment as a result of subsequent interactions within the environment (e.g., viability of a species population resulting from loss of part of a habitat as a result of the Project occupying a plot of land).
Induced	Potential impacts that result from other activities (which are not part of the Project) that happen as a consequence of the Project (e.g., influx of camp followers resulting from the importation of a large Project workforce).

Source: EARG Study Team, 2020

Once impact characteristics are defined, the next step in the impact assessment phase was to assign each potential impact a "**magnitude**". Magnitude is typically a function of some combination (depending on the resource/receptor in question) of the following impact characteristics:

- Extent;
- Duration;
- Scale;
- Frequency; and
- Likelihood (for unplanned event).

Magnitude essentially describes the intensity of the change that was predicted to occur in the resource/receptor as a result of the potential impact. The universal magnitude designations are:

- Positive;
- Negligible;
- Small;

- Medium; and
- Large.

In addition to characterizing the magnitude of impact, the other principal impact evaluation step is definition of the "**sensitivity/vulnerability/importance"** of the impacted resource/receptor. As in the case of magnitude, the sensitivity/vulnerability/importance designations themselves are universally consistent, but the definitions for these designations vary on a resource/receptor basis.

- Low;
- Medium; and
- High.

6.3 Evaluation of Impact Significance

The correlation matrix between project activities and impacts for construction and operation phases of the project is presented in *Error! Reference source not found.*. In this table, using a set of developed criteria impacts were awarded a score ratings on particular impacts as follows:

+3 Very high positive impacts

+2 High positive impacts

+1 Minor positive impacts

0 No impacts

-1 Minor negative impacts

-2 High negative impacts

-3 Very high negative impacts

Mitigation and enhancement measures are developed for significant impacts that were rated +2, +3, -2, and -3. However, some impacts that appears to have less significant values by scoring -1 or +1 on the rating matrix as they stand alone cumulatively, they have significant impact to the environment, these were considered and were discussed under cumulative and residual impacts

Mitigation Hierarchy

- **Mitigation and Enhancement:** to identify appropriate and justified measures to mitigate potential negative impacts and enhance potential positive impacts. The following mitigation hierarchy is considered.

  - *Avoid at Source, Reduce at Source*: avoiding or reducing at source through the design of the Project (e.g., avoiding by siting or re-routing activity away from sensitive areas or reducing by restricting the working area or changing the time of the activity);

  - *Abate on Site*: add something to the design to abate the impact (e.g., pollution control equipment, traffic controls, perimeter screening and landscaping);

  - *Abate at Receptor*: if an impact cannot be abated on-site then control measures can be implemented off-site (e.g., noise barriers to reduce noise impact at a nearby residence or fencing to prevent animals straying onto the site);

  - *Repair or Remedy*: some impacts involve unavoidable damage to a resource (e.g. agricultural land and forestry due to creating access, work camps or materials storage areas) and these impacts can be addressed through repair, restoration or reinstatement measures; and

  - *Compensate in Kind, Compensate Through Other Means*: where other mitigation approaches are not possible or fully effective, then compensation for loss, damage and disturbance might be appropriate (e.g., planting to replace damaged vegetation, financial compensation for damaged houses, crops or providing community facilities for loss, recreation and amenity space).

- **Residual Impact Evaluation:** to evaluate the significance of potential impacts assuming effective implementation of mitigation and enhancement measures. A summary of the interaction between Project activities and its potential impacts is provided in Table 25.

Table 25: Impact Correlation Matrix for Kinyerezi T – Off Point to New Mabibo Transmission Line

		Mobilisation phase				Construction phase			Operation phase			Decommission phase			
		Mobilization of equipment and materials	Recruitment of labour	Site clearance	Land acquisition	Construction of transmission line	Construction of Substations	Construction of access/services roads	Transmission of electricity	Management and maintenance of power line	Management a of substations	Layoff of workers	Demolition of infrastructure	Site rehabilitation	Spoil management
	A: Impacts Related to the Physical Environment														
1	Acceleration of soil erosion	-1	0	-1	0	-2	-1	-2	0	0	-1	0	-2	+1	-1
2	Impaired water resource quality	0	0	-1	0	-2	-2	-1	0	0	-1	0	-1	+1	-1
3	Solid and liquid waste generation	-1	-1	-1	0	-1	-2	-2	0	-1	-2	0	-2	+1	-2
4	Impaired landscape/aesthetics	0	0	-1	0	-2	-2	-1	0	0	0	0	-1	+2	-2
	B: Impacts Related to the Ecological/Biological Environment														
5	Loss of local terrestrial biodiversity	-1	0	-1	0	-1	-1	-1	0	-1	0	0	-1	+1	-1
6	Introduction of alien and invasive species	-1	0	-1	0	-1	-1	-1	0	-1	0	0	-1	+1	0
	C: Positive impacts Impacts Related to Socio-economic Environment														
7	Increased employment opportunities and local economy	+1	+2	+1	0	+2	+2	+2	+2	+1	0	-1	+1	+1	0
8	Increased quality, reliability and efficiency of power supply	0	0	0	0	0	0	0	+2	+1	+1	0	-2	0	0
	Negative impacts														
9	Impaired local air quality	-2	0	-1	0	-1	-1	-1	0	0	0	0	-1	0	--1
10	Increased noise disturbance and vibration	-2	0	-1	0	-1	-2	-1	0	0	0	0	-1	0	-1
11	Impact on community health and safety	-2	0	-2	0	-2	-2	-2	-2	-2	-2	0	-2	-1	-2
12	Loss of land and residential structures	0	0	0	-2	0	0	-2	0	0	0	0	0	0	0
13	Loss of public properties	0	0	0	-2	0	0	0	0	0	0	0	0	0	0
14	Impact to vulnerable people	0	0	0	-2	0	0	0	0	0	0	0	0	0	0
	E. Impacts Related to Archaeological and cultural heritage values														
15	Loss of Artefacts	0	0	-1	0	-1	-1	-1	0	0	0	0	-1	0	0
16	Destruction of graves and graveyard	0	0	-3	0	-0	-1	-2	0	0	0	0	-1	0	0

Source: EARG Study Team, 2020

6.3.1. Biophysical Impacts assessment

6.3.1.1 Negative during construction phase

Impaired water resources quality

Impact on hydrogeology due to construction of tower foundation and access road

The project will cross small streams and one big river (Mbezi River) in several locations of the transmission line. The impact on surface water during construction of tower foundation and access roads is directly linked to slope instability and erosion causing siltation and increase turbidity. Other impacts on surface water will arise from improper waste disposal and sewerage from nearby settlement. The significance of potential impacts to water resources due to construction of tower and contamination from inappropriate waste storage and disposal during the construction phase are assessed in the Table 26.

Table 26: Impact Significance on Water Resources due to tower construction and Wastewater

Impact	Potential for impacts to water resources due to tower construction and wastewater discharges.				
Nature	**Negative**	Positive	Neutral		
	Potential impacts to water resources would be considered to be negative (negative).				
Type	**Direct**	Indirect	Induced	Cumulative	
	Impacts to water resources would be direct impacts from Project activities.				
Duration	Temporary	Short-term	**Long-term**	Permanent	
	The construction phase will last approximately 12 – 24 months. The duration of potential impacts is therefore long-term.				
Extent	**Local**	Regional	International		
	Potential impacts would be limited to the Project site footprint and hence would be considered to be local.				
Scale	Increased soil erosion caused by excavation for foundation and development of access roads coupled with waste disposal in the stretch of 6 km will be significant				
Frequency	Impacts to surface water from wastewater discharges could occur intermittently but repeatedly throughout the day for the duration of the construction phase.				
Magnitude	Positiv	Negligible	Small	**Medium**	Large
	Potential impacts to surface water quality in the Project area from wastewater discharges and runoff are expected to be of low magnitude.				
Receptor/ Resource Sensitivity	Low	**Medium**	High		
	The Project is near some sensitive receptors with regards to surface water quality, such as river crossings. Also, groundwater is a valuable resource for the villages. Overall sensitivity is rated as Medium.				
Significance	Negligible	Minor	**Moderate**	Major	
	ThecombinationofaMediumResourceSensitivityandMediumImpactMagnitudewillresult in an overall Moderate Impact.				

Source: EARG Study Team, 2020

Mitigation measures

- Restricts the distance of towers away from the rivers and streams
- Avoid excavation of foundation during wet season and protect
- Prohibit and enforce measures to minimize pollution of surface water
- Surround the storage areas for batteries and waste in substation and other storage areas with containment/spill control measures
- Position all drainage/tanks, etc. on concrete hard standing to prevent any seepage into ground.
- Use of spill or drip trays to contain spills and leaks
- Establish Guidelines and procedures for immediate clean up actions following any spillages of oil, fuel or chemicals.
- Prepare standard operation procedures (SOPs) to manage any oil spills, leaks and/or seepages.
- Train operating personnel on the SOPs.
- Check and replace oil separators regularly

Impaired local air quality

During construction phase, potential dust pollution will eliminate from site preparation activities:

- Site clearing and related excavation and compaction activities, Dust emissions might impact on the visibility of the nearby roads consequently impacting on traffic safety.
- Operation of heavy machinery and related equipment for earthmoving and construction purposes (excavators, bulldozers, cranes, etc.) will generate dust.
- Transport of building materials and supplies onto the site, and transport of wastes off site.
- Movement of vehicles along roadways and paths, in and out of the site and within the site.

Emissions and dust can occur from any of the activities listed above, but varying in different degrees durations and frequencies. For example, road dust generated from vehicular movements within the site may occur at regular intervals. Other activities may only occur at a certain stage of the construction process, e.g. earthmoving, excavation, demolition and compaction.

The air quality impact on construction transmission line, the 220 kV segment for 9 km would cause emissions over the thresholds, the construction equipment and emissions from motor vehicles used to mobilize the workforce and materials for construction would result in temporary less significant particulate matter impacts. The area where the project is located is already affected by other land uses such that the particulate matter obtained and reported on chapter 4 is likely to be synergistic effects of the present land uses. It must be noted that development of the proposed substation in the area will add to already existing sources of pollution. The $PM_{2.5}$ and PM_{10} Measurement listed in Table 4 would reduce or exceed if mitigation measures will not be addressed. The impact significance is shown on Table 27.

Table 27: Impact Significance on ambient air quality due to construction

Impact	Impact on ambient air quality due to construction activities.				
Impact Nature	**Negative**	Positive	Neutral		
	Impact on human health within the general population is negative.				
Impact Type	**Direct**	Indirect	Induced		
	Impact on human health within the general population is direct.				
Impact Duration	Temporary	Short-term	Long-term	**Permanent**	
Impact Extent	**Local**	Regional	International		
	Impacts on human health within the general population are expected to be local				
Impact Scale	The dust impacts are expected to be localized and short-term. The air quality impacts are expected to be small if all mitigation measures and good site practices are implemented.				
Frequency	It occur in construction phase				
Impact Magnitude	Positive	Negligible	Small	**Medium**	Large
	Considering the magnitude of impacts to air quality , and is medium				
Impact Significance	Negligible	Minor	**Moderate**	Major	Critical
	The significance of this impact is **moderate**				

Source: EARG Study Team, 2020

Mitigation measures

- Specify transport networks and locate stockpiles as far body parts of trucks at all exits of the construction site;
- Control the height of unloading the fill materials during filling as far as possible;

- Compact the reclaimed land immediately to avoid fugitive dust emissions;
- Maintain and check the construction equipment regularly;
- Switch off engines when not in use
- Use sprinkle loose surface earth areas with water to keep dust levels down.
- Use appropriate PPE (respratory masks)
- Cover and contain construction materials in trucks and storage places
- Confine project activities to core construction area
- Maintain all machinery and equipment in good working order to ensure minimum emissions including carbon monoxide, NOX, SOX and suspended particulate matter;
- Covers over wastes

Increased noise disturbances and Vibration

Noise pollution is generally defined as regular exposure to elevated sound levels that may lead to adverse effects in humans or other living organisms. According to the World Health Organization, sound levels less than 70 dB are not damaging to living organisms, regardless of how long or consistent the exposure is. Exposure for more than 8 hours to constant noise beyond 85 dB may be hazardous. This can express itself through restlessness, headaches, inadequate sleep, and diseases of the nervous and vascular system. The occurrence of such diseases lowers the ability of individuals to perform well.

The proposed substation project is located in urbanized areas, surrounded with the surrounding community that engaged in different activities such as commercial activities such as shops, market, garage, different institution such as National Institute of Transportation (NIT)and small cultivation activities

In the construction phase the dominant source of noise is from the construction equipment such as excavators, usually a diesel without sufficient muffling. Construction equipment can be considered to operation in two model, stationary and operational. Stationary equipment operates in one location for one or two days at a time, with either fixed operation (pump, generator, compressor), mobile equipment moves around the construction site with power applied in cycling motion (bulldozer, loader) or to and from the site (truck).

The collected measurement of noise level show that the maximum noise level at market area is 88dB this is above the recommended national and international standard. The presence of constriction activities such as movement of truck and machinery will possibly increase noise level of the area such as bulldozer, backhoe and loaders can produce noise of 115Db, 98dB and 108dB respectively as shown in the Table 28.

Table 28: Assumed construction Equipment sound pressure level inventory

Construction Equipment	SPL, dB(A)
Bulldozer	115
Backhoe	96
Impact pile driver	101
Loaders	108
Vibratory roller	102
Fuel truck	104
Welding machine	101
Cranes	106
Dump truck	105
Grader	114
Fork lifts	112
Compressors	104
Generators	93

Source: OSHA, 2003

The impact will be significantly during construction phase requiring mitigation measures.

Table 29: Impact significance of noise impact during construction phase

Impact	Noise and vibration			
Impact Nature	Negative	Positive	Neutral	
	The nature of impact is negative			
Impact Type	**Direct**	Indirect	Induced	
	Direct impact to the receptor and workers during construction phase of substation and towers. Some noises are likely to be reduced when the mitigation measures are well addressed by contractor while others will be a residual impact			
Impact Duration	**Temporary**	Short-term	Long-term	Permanent
	The impact is temporary it occurs during construction phase			
Impact Extent	**Local**	Regional	International	
	The impact is expected to be local to the society.			
Impact Scale	It is anticipated that impact will be located within the areas under construction			
Frequency	It occurs in construction phase			

Impact Magnitude	Positive	Negligible	**Small**	Medium	Large
	Noise levels generated by construction equipment and machineries are significant, particularly within a distance of 100m from the construction site. The impact magnitude is minor.				
Impact Significance	Negligible	Minor	**Moderate**	Major	Critical
	The significance of this impact is Moderate				

Source: EARG Study Team, 2020

Mitigation and management measures

- Maintain equipment and vehicles to manufacturers' standards;
- Limit operating times to daylight hours;
- Close and turn off plants, compressor, generator and engine compartment doors when not in use;
- Avoid use of particularly noisy plant early in the morning
- Restrict the number of plant items in use at any one time;
- Use appropriate PPE to workers working in noisy areas
- Plant maintenance operations will be undertaken at distance from noise-sensitive receptors;
- Reduce the speed of vehicle movements

Solid and liquid wastes generation and improper waste management

During the construction phase, waste from construction materials, if not stored and disposed of appropriately, have the potential to cause soil and water contamination through direct release or from contaminated storm water runoff. The majority of the generated wastes from the project during the construction phase will be non-hazardous. General construction waste will comprise of surplus or off- specification materials such as concrete, steel cuttings/filings, wooden planks, packaging paper or plastic, wood, plastic pipes, metals, etc.

Construction waste is different from municipal waste and typically comes from renovation, construction, modification and demolition of built facilities. Components of construction waste include concrete, wood, metals, gypsum wallboard, and roofing. A small proportion of the waste generated during construction will be hazardous, including used paint, engine oils, and hydraulic

fluids and waste fuel, spent solvents from equipment cleaning activities, and spent batteries or spent acid/alkali from the maintenance of machinery on site.

Waste from the construction activities arise from the construction material. The material used in the construction process can be classified into two major parts (Gavilan & Bernold, 1994) Consumable material and non-consumable material. It is estimated that 20% to 30% of the construction material is the waste. All wastes will be handled, stored and disposed in accordance. Hazardous wastes will be contracted out to authorize industrial waste companies. The impact of significance is shown in Table 30.

Table 30: Impact significance of solid and liquid wastes and improper waste management during construction

Impact	Impact of improper waste management				
Nature	**Negative**	Positive	Neutral		
	Potential impacts of improper waste management would be considered to be adverse				
Type	(Negative). **Direct**	Indirect	Induced	Cumulative	
	Impacts on improper waste management would be direct impacts generated from project activities.				
Duration	Temporary	Short -term		Permanent	
	The construction phase will last approximately 18-24 months. Significant amount of waste will be generated during contraction phase with little waste coming from repair and maintenance during operation. Thus, the duration of impacts is therefore short term				
Extent	**Local**	Regional	Inter national		
	Potential impacts would be limited to the project area particularly on materials storage yard, towers and substation location and hence considered to be local.				
Scale	Construction activities will take place within the project area. The total approximate quantities of waste that could be a potential source of impact during this stage (assuming a maximum of 100 workers per day) include 500 kg/Cap/day of solid waste.				
Frequency	Impact to soil and water due to un inappropriate waste storage and disposal could occur immediately but repeatedly throughout the day for the duration of the construction phase.				
Magnitude	Positive	Negligible	**Small**	Medium	Large
	Potential impacts on improper waste management are expected to be of small magnitude given the length of the transmission line (9km), in area with similar infrastructures and only one substation.				
Receptor/ Resource Sensitivity	Low	**Medium**	High		
	If not properly managed waste will contaminate soil and surface water affecting their quality.				
Significance	Negligible	**Minor**	Moderate	Major	
	The combination of a Medium Resource Sensitivity and Small Impact Magnitude will result in an overall Minor Impact.				

Source: EARG Study Team, 2020

Mitigation and Management Measures

The following measures will be put in place for the project during construction phase:

- Pursue the policy of Four R's – Recover, Recycle Reduce and Reuse – to manage its waste.
- Provide training to laborers for waste disposal in designated areas and use of sanitation facilities.
- Implement proper storage of the construction materials and wastes to minimize the potential damage or contamination of the materials.
- Segregate hazardous and non-hazardous waste and provide appropriate containers for the type of waste type.
- Store waste systematically to allow inspection between containers to monitor leaks or spills.
- Ensure that storage areas have impermeable floors and containment.
- Dispose of waste by licensed contractors.

6.3.1.2 Impacts during operation phase

Negative biophysical impacts

Impaired water resources quality

During operation phase, the impact on water resource is likely to occur during rainy season where the substation at Mabibo may generate oil contaminated rainwater. If released in surface water untreated, this discharge may have a direct impact on the water quality and ecological implications. In order to minimize this risk, oil separators will be installed so as to capture oil in rainwater prior to discharge. For Mabibo substation, the discharge stream will be sent to an on-site wastewater treatment plant. The impact of ground and surface water contamination from accidental spills and improper disposal of excavated materials, waste and wastewater is similar to those described in the soils and geology section above. Given the low sensitivity of the surrounding areas and the medium magnitude of the potential consequences of an uncontrolled spill, impact is rated as ***moderate*** as shown in Table 31.

Table 31: Impact Significance on Water Resources due to potential leaks/spills

Impact	Impact on water resources due to ***due to potential leaks/spills***			
Nature	**Negative**	Positive	Neutral	
	Potential impacts to surface water would be considered to be adverse (negative).			
Type	**Direct**	Indirect	Induced	Cumulative
	Impacts to surface water would be direct impacts from project activities.			
Duration	Temporary	Short-term	**Long-term**	Permanent
	The operation phase will last for approximately 40years. The duration of potential impacts is therefore long-term.			
Extent	**Local**	Regional	International	
	Potential impacts would be limited to the project site footprint, and hence would be considered to be local.			
Scale	The scale of potential impacts due to leakage of hazardous materials including oil spillage is potentially low due to the fact that all transformers and reactors will be fitted with oil containment chambers to capture any leakage and spillage.			
Frequency	Potential impacts would be expected to be infrequent, only taking place in case of leakage and spillage and the spread only during rainfall, after loss of containment or accidental spills.			
Magnitude	Positive	Negligible	**Small**	Medium	Large
	Potential impact to surface water quality in the project area due to accidental releases is expected to be of Negligible due to treatment (oil separator) prior to discharge.			
Receptor/ Resource Sensitivity	**Low**	Medium	High	
	Accidental releases of hazardous substances are not likely to happen because the substation is located away to sensitive surface water sources and all reactors and transformers are fitted with facility to capture any possible leakages. Therefore, sensitivity is rated as Low.			
Significance	**Negligible**	**Minor**	Moderate	Major
	The combination of a Low Resource Sensitivity and Small Impact Magnitude will result in an overall Negligible Impact.			

Source: EARG Study Team, 2020

Mitigation and Management Measures

- Surround the storage areas for batteries and waste in substation and other storage areas with containment/spill control measure.
- Position all drainage/tanks, etc on concrete hard standing to prevent any seepage into ground.
- Use of spill or drip trays to contain spills and leaks
- Establish Guidelines and procedures for immediate clean up actions following any spillages of oil, fuel or chemicals.
- Prepare standard operation procedures (SOPs) to manage any oil spills, leaks and/or seepages.
- Train operating personnel on the SOPs.
- Regularly check and replace oil separators.

Impaired air quality

During operation, phase dust pollution is not anticipated during operation phase because the site surface will be concrete paved and hence limited or no generation of particulate matter .Although in operating system (transformer and generator) may generate small amount of emission which is not significant impact.

Increased noise disturbances and Vibration

The primary piece of equipment within a substation that is responsible for the production of noise is the transformer, air compressors, fans, and generators. During the operation phase the noise pollution anticipated from substation operation is not significant, except the humming of transformers which may not be detectable outside the perimeter wall fence and given the Project site is front a busy road. On the other hand, noise from overhead line way leave expected from transmission line is not significant. The impact significance is shown in Table 32.

Table 32: Impact significance of noise impact during operation phase

Impact	Noise and vibration				
Impact Nature	Negative	Positive	Neutral		
	The nature of impact is negative				
Impact Type	**Direct**	Indirect	Induced		
	Direct impact to the receptor and workers during construction and operation phases of substation and when the mitigation measures are not well addressed by contractor				
Impact Duration	Temporary	Short-term	**Long-term**	**Permanent**	
	The impact is Permanent ant it is long term until the decommissions phase				
Impact Extent	**Local**	Regional	International		
	The impact is expected to be local to the society.				
Impact Scale	It is anticipated that impact will be located within the area				
Frequency	It occur in operation phase				
Impact Magnitude	Positive	Negligible	**Small**	Medium	Large
	Noise levels generated by Transformer, air compressor and generator are significant, particularly within a distance of 500m from the construction site. The impact magnitude is Medium.				
Impact Significance	Negligible	Minor	**Moderate**	Major	Critical
	The significance of this impact is Moderate				

Source: EARG Study Team, 2020

Mitigation Measures

- Install portable barriers to shield compressors and other small stationary equipment where necessary
- Well-maintained equipment to be operated on-site;
- Ensure regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components;
- Orientate equipment known to emit noise strongly in one direction so that the noise is directed away from receptors far as practicable; and
- Avoid transportation of materials on- and off-site through existing area

Solid and liquid wastes generation and improper waste management

During operation, wastes will be limited to wastes generated from the substations, such as waste oil and general wastes. If not stored and disposed of appropriately, have the potential to cause soil and water contamination through direct release or from contaminated storm water runoff. General wastes will comprise of food waste, plastic, glass, aluminum cans and waste packages will also be generated by the employees in Mabibo Sub Station. A small proportion of the waste generated will be hazardous, including used paint, engine oils, hydraulic fluids, light bulbs, and waste fuel, spent solvents from equipment cleaning activities, and spent batteries or spent acid/alkali from the maintenance of machinery on site. Since employees during operation will be limited, and oil waste will not be generated frequently, impact significance is negligible. The impact significance of improper waste management during operation is shown in Table 33.

Table 33: Impact Significance of improper waste management during operation

Impact	Potential for contamination from inappropriate waste management.			
Nature	**Negative**	Positive	Neutral	
	Potential impacts caused by contamination resulting from improper waste management during operation would be considered to be adverse			
Type	(Negative).**Direct**	Indirect	Induced	Cumulative
	Impacts on improper waste management would be direct impacts generated from project activities like maintenance and repairs during operation			
Duration	Temporary	Short -term	**Long-term**	Permanent
	The duration of impacts i s therefore long-term.			
Extent	**Local**	Regional	Inter national	
	Potential impacts would be limited to the project area and it's downstream, and hence would be considered to be local.			

Scale	Wastes will be limited to wastes generated from the substations, such as waste oil and general wastes. Considering proper waste management practices will be implemented, the scale of potential impacts due to release of waste is considered small				
Frequency	Impacts to soil and water resources due to inappropriate waste storage and disposal may occur but the likelihood of this happening is low.				
Magnitude	Positive	Negligible	Small	Medium	Large
	Considering mitigation measures in place, potential impact to soil and water quality in project area du e to inappropriate waste disposal are expected to be of Negligible magnitude.				
Receptor/ Resource Sensitivity	Low	**Medium**	High		
	The project is away from any sensitive resources such as agricultural lands and domestic use. Overall sensitivity is rated as low.				
Significance	**Negligible**	Minor	Moderate	Major	
	The combination of a Medium Resource Sensitivity and Small Impact Magnitude will result in an overall Negligible Impact.				

Source: EARG Study Team, 2020

Mitigation and Management Measures

The following measures will be put in place for the project during construction phase:

- Educate workers on site to avoid, reduce and reuse wastes generated.
- Site and signpost waste storage facilities in the project site.
- Manage and dispose all waste collected in accordance with the required regulations.
- Dispose of waste by licensed contractors.

6.3.1.3 Impacts during decommissioning phase

The decommissioning process will comprise the following tasks:

i. Remove the conductors from steel lattice towers;

ii. Remove the insulators and other associated fittings from the lattice towers;

iii. Dismantle by unbolting and/or cutting each steel lattice tower component;

iv. Using lifting cranes, place steel lattice tower sections in trucks, cover flatbed

Impaired water resources quality

The impacts on water resource quality during decommissioning would be similar to the construction stage. It will be ensured that debris and other waste materials are not disposed in the surface water bodies. Impact would be minor regional long term positive.

Impaired air quality

The activities involving dismantling, disassembly of the various components of the power transmission line and substation will generate air pollution and impacts would be moderate local short term negative.

Mitigation Measures

- Proper handling, using mask will reduce impact of air pollution

Impact on noise and vibration

The decommissioning activity will generate noise due to dismantling, disassembly of the various components of hybrid power plant. The contractor needs to comply with occupational health safety guideline during this stage. Impact would be moderate local short-term negative.

Impact on Soil & Land Use

The decommissioning activities are likely to have impacts on soil erosion due to demolition activities. Therefore, proper environmental protection measures should be adopted to prevent any adverse incidences. Parcels of land under permanent structures such as towers, substation buildings etc need to be restored to its near original state by re-laying of the topsoil. This phase will not create negative impact to the flora and fauna present in and around the site. Impact would be moderate local long term positive.

6.3.2 Socio-economic impact assessment

This section describes the predicted socio-economic impacts associated with construction and operation of the project. It is based on the baseline data presented and the impact assessment methodology detailed in Chapter 4.

A project's area of influence generally includes the following:

- Direct footprint of the land that will be acquired and used. This is generally the land area that will be fenced and reserved for the project and where the public will not be allowed access.

- A physical distance around the direct footprint at a scale depending on the emissions related to a particular activity.
- A physical distance around the direct footprint at a scale depending on the indirect effects of a particular activity.

Impacts are described in the context of the effect that a project or a project's activities will have on a receptor. In this instance, the project receptors are the local people located within the area of influence and along ROW that may be impacted or influenced by the project (as a result of their proximity to the project site and/ or project associated infrastructure).

6.3.2.1 Impacts during construction phase

Positive impacts

Improved employment opportunities and local economy

The project will generate a range of employment opportunities. During construction, it is expected that **about 220 people** including Japanese, local workers workers are expected to be employed during the construction phase. The breakdown of workers will be as follows: -

i. Civil & Building work → About 50 people,
ii. Substation work → About 70 people
iii. Transmission line work → About 100 people

The number of people employed by the project will decrease at the end of the construction phase. It is anticipated that approximately 10 employment opportunities will be created during the operation phase. The project will also require security. Security personnel will be employed during construction phase.

The resulting impacts (e.g. increase in employment opportunities, increase in income for local people employed by the project) were assessed as a positive. Significance of impact on employment opportunities and local economy is shown in Table 34.

Table 34: Significance of Impact on employment opportunities and local economy

Impact	Impact on increased employment opportunity to the local community		
Impact Nature	**Negative**	Positive	Neutral
	Employment opportunity to local community is considered positive		
Impact Type	**Direct**	Indirect	Induced
	The impact is direct.		

Impact Duration	Temporar	Short-term	Long-term	**Permanent**
	The impact will be temporal during construction and permanent during operation phase			
Impact Extent	**Local**	Regional	Global	
	The impact is limited to the project site.			
ImpactScale	The impact scale is Medium.			
ImpactFrequency	The impact will occur continuous during new recruitment on construction phase and operation phase.			
ImpactMagnitude	Positive	Negligible	Small	**Medium**	Large
	The impact magnitude is medium given the number of people to be employed**.**			
Vulnerabilityof Receptors	**Low**	Medium	High	
	The vulnerability of receptor is likely to be **Low.**			
Significance	Negligible	**Minor**	Moderate	Major
	The significance is likely to be **Minor.**			

Source: EARG Study Team, 2020

Measures to maximize positive impacts

- Develop and implement a local recruitment and procurement management plan.
- Consult with relevant stakeholders, including government authorities, especially mtaa and ward leaders in developing the local recruitment plan.
- Inform mtaa and ward leaders of job opportunities in a timely manner.
- Inform local businesses of contracting opportunities in a timely manner such as awareness on forthcoming investment and employment opportunities such as food vendors.

Improvement in Quality, reliability and Efficiency of power supplied

This is positive impact of the establishment of the propose project during operation phase, the reliability and quality are two important aspects of any electrical power supply system. Power Reliability means availability of power supply 24×7 basis that constitutes adequacy of electrical system at all levels from generation, transmission to distribution. However, power quality refers to both the extent of deviation or distortion in pure supply waveform and the continuity of supply. Any significant deviation in the magnitude, frequency, waveform or symmetry of line voltages is a potential power quality problem. Now days Tanzania is in middle economy, and engaged more in industrial, commercial and domestic facilities in which more energy (electricity) is needed, a reliable power system has enough generation, demand response and network capacity to supply customers with the energy that they demand with a very high degree of confidence. This requires the system being in a secure operating state, that is, able to withstand shocks to its technical equilibrium. The improvement of quality, reliability and

efficiency of power supplied will attract more investors to invest in the country. The significance on improvement of quality, reliability and efficiency of power supplied is shown is Table 35.

Table 35: Significance on improvement quality, reliability and efficiency of power supplied

Impact	Improvement quality, reliability and efficiency of power supplied				
Impact Nature	Negative	**Positive**	Neutral		
	Improvement quality, reliability and efficiency of power supplied is Positive				
Impact Type	**Direct**	**Indirect**	Induced		
	Direct impact the proposed project will improve quality, reliability and efficiency of power supply through improving voltage transported, substation to regulate and inconsistency and fluctuations				
Impact Duration	Temporary	Short-term	Long-term	**Permanent**	
	The improvement of quality reliability and efficiency of power supply				
Impact Extent	**Local**	**Regional**	**International**		
	The impact is expected to be local to the society, regional and National				
ImpactScale	It is anticipated that the project will be located within the city and country through National grid				
Frequency	It occur in operation phase				
Impact Magnitude	**Positive**	Negligible	Small	Medium	Large
	Considering the magnitude of impacts to improve the quality , and efficiency of power is positive				
Impact Significance	Negligible	Minor	Moderate	**Major**	Critical
	The significance of this impact is **major**				

Source: EARG Study Team, 2020

Enhancement of the impact

- Ensure project is timely implemented to realize the benefits
- Increase income to the country
- Improve life standards of the people
- Growth of the city and town
- Enhance development activities like business and industries
- Lower electricity bills
- Reduce power losses
- Improve voltage to equipment

Negative impacts impact during construction phase

Impact on community health and safety

Site preparation activities, transport of materials and civil works will cause disturbances to neighbouring settlements due to dust, noise and vibration that will be generated by these activities. Particularly, settlements located close to the existing transmission line and along access roads will be affected. Around

220 workers in cumulative total number are expected during the peak of construction. During the peak period of construction, around 50 - 100 workers on daily basis would be required. Since the transmission line construction will occur on a short distance and in areas where there is existing power transmission line temporal demographic changes during construction are not likely to be significant.

The influx of people will influence the change of behaviour of some members in the community due to the interaction of people with different lifestyles and behaviour. This will increase the chances of infection of diseases including HIV/AIDs and Sexual Transmission Diseases (STDs). Also, the influx of workers in the area may increase level of crime and insecurity among community members. Since the proposed project is located in a City with high concentration of people and traffic volume, the transport of workers and goods to and from the Project site will also impact traffic conditions. Heavy cargo to the site will be transported via different access roads. With an increase in vehicles, particularly heavy haulage vehicles, there will be a potential for accidents and inquiries to occur.

However, the construction of transmission towers will only take a couple of months. Thus, the presence of workers in a particular area will be local and temporary. Given the existing management measures, the local extent and scale of the impact, the impact was assessed as Minor and negative. The significance of Impact on Community Health and Safety during construction is shown in Table 36.

Table 36: Significance of Impact on Community Health and Safety during construction

Impact	Impact on community health, safety and security during construction			
Impact Nature	**Negative**	Positive	Neutral	
	Increase of risk in community health, safety and security is negative.			
Impact Type	**Direct**	Indirect	Induced	
	The impact is both direct and indirect being within the city other factors			
Impact Duration	Temporary	**Short-term**	**Long-term**	Permanent
	Impact can range from short to long-term, if not properly addressed			
Impact Extent	**Local**	Regional	Global	
	The impact is limited to the local communities that are located close to the transmission line and along access roads.			
Impact Scale	The impact scale is Medium.			
Impact Frequency	The impact is likely to occur during the construction phase, at certain inevitable occasions.			
Impact Magnitude	Positive	Negligible	Small	**Medium**	Large
	Influx of workers and impacts of construction activities may increase risk to community health. The impact magnitude is likely to be **Medium.**			
Vulnerability of Receptors	Low	**Medium**	High	
	The transmission line towers will be located within the existing power transmission line. However, there are nearby communities located close to the transmission line route and along access roads. Thus, the receptor sensitivity is considered **Medium.**			
Significance	**Negligible**	Minor	**Moderate**	Major
	The significance is likely to be **Moderate.**			

Source: EARG Study Team, 2020

Mitigation Measures

- Train all workers on the transmission routes and common symptoms of communicable diseases as well as sensitization of enforcement of HIV/AIDS law and regulations.
- Establish a workforce code of conduct. Include in the code specific measures on anti-social behaviour.
- Prepare emergency management procedures, should a health issue escalate and require a rapid response.
- Implement a grievance mechanism

Increased accidents, risks and hazards

The construction of the transmission line and substation will require around 220 workers in cumulative total number are expected during the construction. During the peak period of construction, around 50 to 100 workers on daily basis would be required. These workers will be exposed to noise, dust, vibration at source and other occupational hazards related to site preparation and construction works. In particular, the construction of transmission towers would require work at considerable heights.

It is important to note that construction period will only last for approximately 12 months. Operation of construction machineries will also be intermittent. Thus, these impacts will be temporary as shown in Table 37. In order to ensure the protection of health and safety of all the workers, mitigation and management measures will be implemented in accordance with applicable laws and regulations.

Table 37: Significance of impact on accidents, risks and hazards during construction

Impact	Increased accidents, risks and hazards			
Impact Nature	**Negative**	Positive	Neutral	
	Potential health and safety risks to workers are negative			
Impact Type	**Direct**	Indirect	Induced	
	The impact is **direct** to the workers' health and safety.			
Impact Duration	Temp	Short-term	Long-term	Permanent
	Impact is temporal to short term effect.			
Impact Extent	**Local**	Regional	Global	
	The impact is limited within the local area.			
Impact	The impact scale is medium.			
Impact Frequency	Theimpactlikelyoccursduringtheconstructionphasewiththerarefrequency.			
Impact Magnitude	Positive	Small	**Medium**	Large
	The impact magnitude is likely to be **Medium** since the workers and local communities are directly exposed to the hazards.			

Vulnerability of Receptors	Low	**Medium**	High	
	The vulnerability of receptor is likely to be **medium** since thousands of workers will be involved in the project			
Significance	Negli	Minor	**Moderate**	Major
	The significance is likely to be **moderate.**			

Source: EARG Study Team, 2020

Mitigation measures

- Provide and enforce the proper use PPEs
- Provide health checks to the employees
- Provide training on relevant safety measures, first aid procedures and emergency response to workers.
- Provide full package of first aid kit at work places
- Monitor implementation of the training over time
- Provide safety signs
- Ensure regular maintenance of machines and equipment to minimize oil leakage
- Create awareness on all security and safety issues and hazards at the site

Destruction on graves and graveyard

The proposed project will affect graves that are in a grave yard along the power transmission line. It is anticipated that a total of 135 graves beneath two towers at Ubungo Kisiwani (Photo 8) will be affected by the project and will have to be relocated prior to implementation of the project. Also, there is another Kijiweni grave yard at Mavurunza mtaa in Kimara ward (Photo 9) with about 15 graves that are likely to be affected by the proposed project. The impact Significance on archaeological and cultural heritage is shown in Table 38.

Photo 8: Graves in the existing Power transmission line likely to be affected by the New transmission line at Ubungo Kisiwani in Ubungo ward
Source: EARG Study Team, 2020

Photo 9: Graves in the existing Power transmission line likely to be affected by the New transmission line at Mavurunza mtaa in Kimara ward
Source: EARG Study Team, 2020

Table 38: Impact Significance on archaeological and cultural heritage

Impact	Impact on graves and other archaeological and cultural heritage			
Impact Nature	**Negative**	Positive	Neutral	
	Impact on graves and grave yards during construction is **negative.**			
Impact Type	**Direct**	Indirect	Induced	
	The impact is **direct** to the sites and objects with values.			
Impact	Temporary	Short-term	Long-term	**Permanent**

Duration	Impact is likely to be long-term until the duration of the project.				
Impact Extent	**Local**	Regional	Global		
	The impact is limited within the affected localities.				
Impact Scale	The impact scale is low but has the potential to be high depending on unplanned discoveries.				
Impact Frequency	The impacts likely to occur during the construction with the rare frequency.				
Impact Magnitude	Positive	Negligible	Small	**Medium**	Large
	The impact magnitude is likely to be**medium.**				
Vulnerability of Receptors	Low	**Medium**	High		
	The vulnerability of receptor is likely to be**Medium**due to presence of culturally significant sites along the route.				
Significance	Negligible	Minor	**Moderate**	Major	
	The significance is likely to be**Moderate.**				

Source: EARG Study Team, 2020

Mitigation measures

- Communicate closely with the affected families.
- Abide by the necessary cultural and legal procedures.
- Provide compensation as stipulated in the Abbreviated Resettlement Action Plan (ARAP)

Impact on Vulnerable households/population

These are people with special needs that would require special consideration and assistance from project implementers or community in general. They include the elderly, sick (HIV/AIDs afflicted persons), orphans, women with special needs (e.g. single parents, widows) and farmers likely to suffer loss of land due to construction of transmission line, substations and related facilities (whether owners, encroachers or tenants). These groups are being identified as particularly vulnerable so that special attention would be paid to them by identifying their needs from the baseline study. The household survey identified different categories of vulnerable people as shown in Table 39. The level of impact significance is shown in Table 40.

Table 39 Vulnerable Households and Population

S/n	Type of vulnerability	Number
1	Elders (Above 60 years old) with physical disability (Blind)	03
2	Widow (Female Headed household)	03
3	Elder with physical disability due to stroke – an encroacher at Kilungule A in Kimara ward	01
4	An orphan – owner of the incomplete structure at Kilungule B mtaa in Kimara ward – He is currently living in Iringa	01
	Total	**08**

Source: EARG Study Team, 2020

Table 40 Impact Significance on vulnerable groups

Impact	Land acquisition and resettlement impact on vulnerable households and people				
Impact Nature	**Negative**	Positive	Neutral		
	Acquiring land and properties would result in negative impact for affected vulnerable				
Impact Type	**Direct**	Indirect	Induced		
	The impact is **direct** to the affected population (formal and informal owners and settlers)				
Impact Duration	Tempo	Short-term	**Long-term**	Permanent	
	Impact has the potential to have a lastingeffect.				
Impact Extent	**Local**	Regional	Global		
	The impact is limited within the local				
ImpactScale	The impact scale is medium.				
Impact Frequency	The Impact will occur once prior to commencement of the construction phase.				
Impact Magnitude	Posi	Negligible	Small	**Medium**	Large
	The impact magnitude is likely to be **Medium.**				
Vulnerability of Receptors	Low	**Medium**	High		
	The vulnerability of receptor is likely to be **medium.**				
Significance	Neglig	Minor	**Moderate**	Major	
	The significance is likely to be **moderate.**				

Source: EARG Study Team, 2020

Mitigation measures

- Provide Income Restoration Program for Vulnerable households
- Provide assistance on how to go through the compensation process.

Loss of residential structures

There will be an impact of loss of about 14 residential structures that will be caused by the construction of the proposed project. Among these, 11 houses are located at Kibo Mtaa in Ubungo ward and three structures which are considered as encroachers are located within the way leave of power transmission line, one at Kilungule A in Kimara ward and two houses are located at Kimara Baruti. Types of houses to be affected are largely the common semi urban houses cement blocks with corrugated iron sheets as roofing materials. Among the 14 affected residential structures 12 are used as residents for the owner of the house and two in Kimara Baruti are used with tenants and therefore a source of income for the owner. Photo 10, shows some of the structures to be affected by the project at Kibo mtaa in Ubungo ward and Kilungule A in Kimara ward. The significance in relation to loss of land and structures is in Table 41.

Photo 10: Some of residential structures to be affected at Kibo mtaa in Ubungo ward
Source: Field survey, EARG Team, 2020

Table 41: Impact Significance of loss of land and structures

Impact	Land acquisition and resettlement impact				
Impact Nature	**Negative**	Positive	Neutral		
	Land acquisition at Kibo in Ubungo would result in **negative** impact for those affected in terms of loss of land and structures.				
Impact Type	**Direct**	Indirect	Induced		
	The impact is **direct** to the affected population (formal and informal owners and settlers).				
Impact Duration	Tempo	Short-term	Long-term	**Permanent**	
	The impact is permanent.				
Impact Extent	**Local**	Regional	Global		
	The impact is limited within the local community at Mtaa level.				
Impact	The impact scale is medium.				
Impact Frequency	The impact will occur once prior to commencement of the construction phase.				
Impact Magnitude	Posi	Negligible	Small	**Medium**	Large
	The impact magnitude is likely to be **Medium.**				
Vulnerability of Receptors	Low	**Medium**	High		
	The vulnerability of receptor is likely to be **medium.**				
Significance	Neglig	Minor	**Moderate**	Major	
	The significance is likely to be **moderate.**				

Source: JICA Study Team, 2018

Mitigation measures

- Conduct land acquisition process in accordance with the Abbreviated Resettlement Policy Framework

- Provide income restoration for those who will lose their livelihood due to land acquisition.
- Keep constant and open communication with PAPs and other stakeholders
- Provide assistance to vulnerable groups on how to go through the compensation process
- Set up a grievance mechanism to address any concern

Loss of public properties (Toilet facilities and Fencing)

The public properties likely to be affected by the project include structures and land that are publicly owned, used or controlled, example by a government authority, such as a school, health center or sports field; and those that are actually private, but serving a community purpose, such as a place of worship, a private clinic or a private school. Although the proposed power transmission line will use the existing way leave, its construction will affect toilets at Kilungule B primary school which has encroached the TANESCO's way leave. The toilets to be affected is shown in Photo 5 are used by 1,818 pupils of which 978 are boys and 840 are girls. The school has also 39 teachers of which four are males and 35 are females. Furthermore, the project will affect boundary fences which have been extended to the way leave of the power transmission line. These fences belongs to the Tanzania Harbours Authority and National Social Security Fund in Ubungo Kisiwani as well the National Institute of Transport in Mabibo ward. All three government institutions will lose their boundary fences. If the project needs to demolish these structures, it will pay replacement cost without depreciation and salvage value at the current market prices. The toilet facilities and fencing with series of storage facilities are shown in Photo 11 and 12.The impact significance of public properties (toilet facilities and fencing) is shown in Table 42**.**

Photo 11: Toilet facilities at Kilungule Primary School to be affected by the project

Photo 12: Extended wall within the existing power transmission line at Ubungo Kisiwani
Source: *Source: Field survey, EARG Team, 2020*

Table 42: Impact Significance of public properties (Toilet facilities and Fencing)

Impact	Land acquisition and resettlement impact to public properties			
Impact Nature	**Negative**	Positive	Neutral	
	Land acquisition at Ubungo Kisiwani and Mavurunza would result in **negative** impact for those affected in terms of loss of public properties.			
Impact Type	**Direct**	Indirect	Induced	
	The impact is **direct** to the affected population (public institution and primary school).			
Impact Duration	Tempo	Short-term	Long-term	**Permanent**
	The impact is permanent.			
Impact Extent	**Local**	Regional	Global	
	The impact is limited within the local community at Mtaa.			
Impact	The impact scale is medium.			

Impact Frequency	The impact will occur once prior to commencement of the construction phase.				
Impact Magnitude	Posi	Negligible	Small	**Medium**	Large
	The impact magnitude is likely to be **Medium.**				
Vulnerability of Receptors	Low	**Medium**		High	
	The vulnerability of receptor is likely to be **medium.**				
Significance	Neglig	Minor	**Moderate**	Major	
	The significance is likely to be **moderate.**				

Source: EARG Study Team, 2020

Mitigation measures

- Conduct land acquisition process in accordance with the Abbreviated Resettlement Policy Framework
- Keep constant and open communication with PAPs and other stakeholders
- Set up a grievance mechanism to address any concern

6.3.2.2 Impacts during operation phase

Impact on community health and safety

The number of workers that will be employed during operation of the transmission line and substation will be very limited compared to construction phase. The New Mabibo Substation will be manned and operation activities will be limited to maintenance of substation, ROW, and inspection of transmission lines and towers thus requiring limited manpower (approximately 25 workers). Thus, impact of worker influx during operation phase is considered negligible.

However, there are safety issues with the establishment of new infrastructure such as community members being in close proximity with transmission towers and substation. There is a risk of non-workers wandering into project site (e.g. transmission towers and substation) and being exposed to the hazards which can lead to onsite accidents and injuries. Security personnel will also be employed during operation phase.

Mitigation measures

- Create awareness on all security and safety issues and hazards associated with transmission line towers and substation.
- Provide appropriate training for security personnel
- Monitor implementation of the training over time
- Construct fence around transmission line towers and substation.

- Provide safety signs.
- Implement a grievance mechanism.

Increased accidents, risks and hazards

During operation phase, it is anticipated that approximately 10 people will be employed. These workers, particularly those who will be engaged in the maintenance of substations, ROW, and inspection of transmission lines and towers will be exposed in health and safety hazards (e.g. exposure to high voltage facilities). In order to ensure the protection of health and safety of all the workers, mitigation and management measures will be implemented in accordance with applicable laws and regulations. The impact significance on accidents, risks and hazards during operation in Table 43.

Table 43: Significance on accidents, risks and hazards during operation

Impact	Impact on occupational health and safety				
Impact Nature	**Negative**	Positive	Neutral		
	Risks to health and safety to workers is **negative.**				
Impact Type	**Direct**	Indirect	Induced		
	The impact is **direct** to the workers' health and safety.				
Impact Duration	Temporar	Short-term	**Long-term**	Permanent	
	Impact may be short-term but it has the potential to have longer lasting effect.				
Impact Extent	**Local**	Regional	Global		
	The impact is limited to workers involved in the project.				
Impact Scale	The impact scale is Medium.				
Impact Frequency	The impact is likely to occur during the operation phase with rare frequency.				
Impact Magnitude	Positive	Negligible	Small	**Medium**	Large
	The impact magnitude is likely to be **Medium.**				
Vulnerability of Receptors	**Low**	Medium	High		
	The vulnerability of receptor is likely to be **medium** since workers will be limited during operation phase and there will be mitigation and management measures in place.				
Significance	Negligible	**Minor**	Moderate	Major	
	The significance is likely to be **moderate.**				

Source: EARG Study Team, 2020

Mitigation measures

- Provide and enforce the proper use PPEs
- Provide health checks to the employees
- Provide training on relevant safety measures, first aid procedures and emergency response to workers.
- Provide full package of first aid kit at work places

- Monitor implementation of the training over time
- Provide safety signs
- Ensure regular maintenance of machines and equipment to minimize oil leakage

6.3.2.3 Impact during decommissioning phase

Positive impacts

Employment

All activities will have to be carried out by people who are paid. Decommissioning activities will provide short-term employment for drivers, clearing workers, quarry restoration workers etc.

Enhancement measures

During decommissioning, local workers should be employed to carry out the removal and clearing activities.

Improved Aesthetics

The site will be restored to its near original state before being handed over the original land owners.

Negative impacts

Public Health and Safety Risks

As with all work activities, the decommissioning phase will also create health and safety risks to the public. The risk of spreading communicable diseases is always present irrespective of the duration of the project activity. Communicable diseases of most concern especially during the construction phase are sexually transmitted diseases (STDs), and highly contagious disease outbreaks such as the novel Corona Virus pandemic. The communities and workers are equally at risk of contracting diseases during the decommissioning phase.

Risks to occupational Health and Safety

Decommissioning will involve use of machinery and equipment that may endanger the lives of both operators and other workers within the sites. Other issues which could be pertinent to worker health and safety during the decommissioning phase include risks and hazards associated with noise and vibration, air quality and personal attacks. Work related stress including long hours of work and under extreme heat may also affect workers. More details of biophysical and

socio-economic impacts during decommissioning phase have been discussed in chapter 10.0 on decommissioning plan.

6.4 Project Alternatives

In order to make better and informed decisions, consideration of project alternatives that can enable achievement of the same or better results with less adverse effects including costs is important. The main factors considered in the selection of alternatives included potentiality of the option in terms of economic development, location, magnitude of loss and sensitivity of area. Based on identified project issues and foreseen impacts, the following alternatives are discussed at this preliminary stage of the EIA process for the proposed project.

The "No Project" Alternative

The no project alternative entails maintaining the current power transmission status by not upgrading the power transmission to the proposed 220 MW. This alternative if considered will deny all the positive impacts associated with the proposed upgrading will stagnate anticipated industrial supplies and reliable power to the area of Mabibo and other targeted area. Therefore, this alternative is not viable and will not be considered since the country need power to supply to the expanding demand to feed significant number of newly established industries as the country is implementing and industrialization scheme to rich middle-income country by 2030.

Connecting the line to the existing Ubungo substation

The proposed project involves construction of new substation at Mabibo area. With the development of new substation, the transmission line from Kinyerezi will bypass Ubungo substation and touches some few houses adjacent to Ubungo substation. As an alternative to this approach the proposed line from Kinyereze T-off point should connect to Ubungo substation and avoid affecting households adjacent to Ubungo substation and business taking place adjacent to Ubungo substation. However, this alternative does not provide maximum supplies to Mabibo and other areas targeted by the proposed improvement. The following alternatives shown in Table 44 and Table 45 – 46 were analyzed for the Power Transmission Line and Substation respectively.

Table 44: Comparison between Alternatives for Transmission Line Routs

	Component	Social Environment (Resettlement)	Natural Environment
Alt-1	▪ Transmission line between Kinyerezi P/S – Mburahati S/S:total lengths :approx. 20 km 1) New construction along existing between Kinyerezi P/S – T-Off point in Kimara: approx..7km 2) New construction between T-Off point in Kimara – KM-06 (Ubungo-Morogoro): approx. 1.6km 3) New construction along existing power transmission line between KM-06 (Ubungo-Mologoro) – Ubungo S/S: 7km 4) Replacement of the KM-06 (Ubungo-Mologoro) – New Mburahati S/S: 5km	▪ Transmission line between Kinyerezi P/S – New Mburahati S/S 1) Kinyerezi P/S – Existing T-Off point at Kimara:74 Hs are likely affected. 2) T-Off point at Kimara- KM-06 (Ubungo-Mologoro): 46 Hs are likely affected. 3) New construction KM-06 - New Mburahati S/S: The new line will be accommodated between existing 132kV and 220kV within the current ROW. 4) Replacement of the KM-06 – New Mburahati S/S: within current operational ROW More than 120 Hs are likely affected in total.	▪ The new lands between Kinyerezi P/S – T-Off point in Kimara with the length of approx. 7 km will be newly developed for the ROW. ▪ The new lands between T-Off point in Kimara – KM-06 with the length of approx. 1.6 km will be newly developed for the ROW. ▪ No new land acquisition is required KM-06 - New Mburahati S/S with the length of approx. 5 km
Alt-2	▪ Replacement of the existing transmission line between Kinyerezi PS – Ubungo SS:13km ▪ Replacement of the Ubungo SS – New Mburahati S/S: 5km	▪ Kinyerezi P/S – KM-06: No particular resettlement within currently operation ROW. ▪ T-Off point at Kimara – Ubungo S/S: No particular resettlement within current operation ROW. ▪ Replacement of Ubungo S/S – New Mburahati S/S: within current ROW No particular resettlement.	▪ The project activities only limited to replace the old transmission line and no land acquisition is expected. The impact on the natural environment is low.

Alt-3	▪ Replacement of the existing power transmission line between Kinyerezi PS – Ubungo SS:13km.	▪ Kinyerezi P/S – Existing T-Off point at Kimara:74 Hs are likely affected. ▪ T-Off point at Kimara – Ubungo S/S: No particular resettlement within currently operation ROW. ▪ Replacement of Ubungo S/S – New Mburahati S/S: within current ROW More than 74 Hs are likely affected in total.	▪ The new lands between Kinyerezi P/S – T-Off point in Kimara with the length of approx. 7 km will be newly developed for the ROW.
Alt-4	▪ (New Mabibo S/S) ▪ Transmission line 1) New construction along existing between T-Off point in Kimara – New Mabibo S/S: approx..9km 2) New construction along existing between T-Off point in Kimara – Ubungo S/S: approx..7km 3) New construction between Kinyerezi P/S- Luguruni S/S: approx..15 km ▪ New Switchgear construction in Kinyerezi P/S	▪ Transmission line 1), 2) T-Off point in Kimara – New Mabibo S/S: approx. 7 Hs (South of Ubungo S/S) 3) ・Kinyerezi P/S – Luguruni S/S: 35Hs are likely affected. ▪ New Switchgear construction in Kinyerezi P/S: No affected Hs within compound. More than 7 Hs are likely affected in total (Out of Grant Aid scope: 35 Hs are likely affected).	The new lands between Kinyerezi P/S – Luguruni S/S with the length of approx. 15km will be newly developed for the ROW.
Alt-5	▪ Transmission line 1) New Alignment between T-Off point in Kimara – KM-06: approx. 2km 2) Replacement of KM-06 – Mburahati S/S: 10km 3)New construction between Kinyerezi P/S – Luguruni S/S (Out of Grant Aid scope): approx. 15km ▪ Connection to Ubungo S/S	▪ Transmission line 1) New Alignment between T-Off point in Kimara – KM-06: 46 Hs likely affected. 2) KM-06 – Mburahati S/S: No particular resettlement within currently operation ROW. 3) Kinyerezi P/S – Luguruni S/S: 35Hs are likely affected (Out of Grant Aid scope) ▪ Connection to the Ubungo S/S: No particular resettlement within currently operation ROW. More than 46 Hs are likely affected in total. (Out of Grant Aid scope: 35 Hs are likely affected).	The new lands between Kinyerezi P/S – Luguruni S/S with the length of approx. 15km will be newly developed for the ROW.

Alt-6 Proposed project with New Mabibo S/S	▪ Transmission line (triple circuits & double circuits) 1) New construction along existing between T-Off point in Kimara – New Mabibo S/S replacing existing transmission facilities: approx..9km 2) New construction along existing between T-Off point in Kimara – Ubungo S/S replacing existing transmission facilities: approx..7km ▪ New Switchgear construction in Ubungo S/S ▪ New Switchgear construction in Kinyerezi P/S	▪ Transmission line 1), 2) T-Off point in Kimara – New Mabibo S/S: approx. 7 Hs (Only in the area where new ROW required at South of Ubungo S/S) ▪ New Switchgear construction in Ubungo S/S: No particular resettlement within currently operation ROW. ▪ New Switchgear construction in Kinyerezi P/S: No particular resettlement within currently operation ROW. Approx.7 Hs are likely affected in total.	▪ The project activities only limited to replace the old transmission line and no land acquisition is expected. The impact on the natural environment is low.

Source: JICA Study Team 2020

Table 45: Alternative Comparison on Overall evaluation of the Transmission Routs

Evaluation	Requested	Alt 1	Alt 2	Alt 3	Alt.4	Alt. 5	Alt. 6
Transformer Cost	C	A	B	A	B	C	A
Transmission line cost	B	B-	A	B-	C	C	C
Land constraint at Existing Substation	A	A	A	C	A	A	B
Ease of ROW Acquisition	B	**C-**	A	C	B	B	B
Power evacuation During construction	B	A	B	B	A	A	A
Ease of O&M	B	A	A	A	B	A	B

Reliability	C	A	**C-**	A	B	B	A
Overall(Points)	19	-	-	20	23	23	25

【Note】Evaluation was made and calculated as A:Excellent(5 points), B:Very Good(3 points), B-: Good (2 points), C: Acceptable(1 point), C-: Fail. Since C- is a fatal problem, alternative with C- evaluation are excluded from the comparison.

Source: JICA Study Team 2020

Table 46: Comparison between Alternatives for Substation Constructions

	Project Component	Social Environment (Resettlement)	Natural Environment
Alt. 1	New Construction of Mburahati Substation：Approx. 2 ha（65 m×307 m）	Mburahati Substation: 56 Hs	The Mburahati substation site is sloped and needs to be examined to prevent landslides and runoff.
Alt. 2 (Proposed)	New Construction of Mabibo Substation: Approx. 2.5 ha	Mabibo Substation: 0 Hs	Substation site is sloped and needs to be examined to prevent landslides and runoff.

Source: JICA Study Team 2020

6.5 Proposed Mitigation measures

Impact mitigation involves undertaking mitigation or enhancement activities during mobilization, construction, and operation phases of the project to minimize the predicted impact. These activities are designed to eliminate, offset, or reduce adverse environmental impacts to acceptable levels and enhance positive ones. Mitigation measures are incorporated as part of the environmental management plan which describes the mitigation management required to ensure proper implementation of agreed mitigation measures and verification of predicted environmental impacts (Brew and Lee, 1996).

This section summarizes the impact mitigation/enhancement options developed after analysis of the impacts in chapter six; these measures will further be incorporated in the Environmental management plan chapter eight and environmental and social monitoring plan chapter 9 of this document. It is anticipated that the measures will guide the contractor in safe guarding the environment; similarly the developer will set aside funds to implement the mitigation and enhancement measures highlighted.

6.5.1 Mitigation and management measures on biophysical environment

Negative impacts during construction phase

1. **Impaired water resources quality**
    - Restricts the distance of towers away from the rivers and streams
    - Prohibit and enforce measures to minimize pollution of surface water
    - The storage areas for batteries and waste in substation and other storage areas will be surrounded by containment/spill control measure to prevent spilled oil, fuel and chemicals from percolating into the ground or reaching the receiving waters.
    - Position all drainage/tanks, etc. on concrete hard standing to prevent any seepage into ground.
    - Use of spill or drip trays to contain spills and leaks
    - Establish Guidelines and procedures for immediate clean up actions following any spillages of oil, fuel or chemicals.

- Prepare standard operation procedures (SOPs) to manage any oil spills, leaks and/or seepages. .
- Train operating personnel on the SOPs.
- Check and replace oil separators regularly

2. Impaired local air quality

- Specify transport networks and locate stockpiles as far body parts of trucks at all exits of the construction site;
- Control the height of unloading the fill materials during filling as far as possible;
- Compact the reclaimed land immediately to avoid fugitive dust emissions;
- Maintain and check the construction equipment regularly
- Switch off engines when not in use
- Use sprinkle loose surface earth areas with water to keep dust levels down.
- Use appropriate PPE (respratory masks)
- Cover and contain construction materials in trucks and storage places
- Confine project activities to core construction area

3. Increased noise disturbances and vibration

Mitigation and management measures

- Maintain equipment and vehicles to manufacturers' standards;
- Limit operating times to daylight hours;
- Close and turn off plants, compressor, generator and engine compartment doors when not in use;
- Avoid use of particularly noisy plant early in the morning
- Restrict the number of plant items in use at any one time;
- Plant maintenance operations will be undertaken at distance from noise-sensitive receptors;
- Reduce the speed of vehicle movements

4. Solid and liquid wastes generation and improper waste management

Mitigation measures

- Pursue the policy of Four R's – Recover, Recycle, Reduce and Reuse – to manage its waste.
- Provide training to laborers for waste disposal in designated areas and use of sanitation facilities.
- Implement proper storage of the construction materials and wastes to minimize the potential damage or contamination of the materials.
- Segregate hazardous and non-hazardous waste and provide appropriate containers for the type of waste type.
- Store waste systematically to allow inspection between containers to monitor leaks or spills.
- Ensure that storage areas have impermeable floors and containment.
- Dispose of waste by licensed contractors

Impacts during operation phase

1. **Impaired water resources quality**
    - The storage areas for batteries and waste in substation and other storage areas will be surrounded by containment/spill control measure to prevent spilled oil, fuel and chemicals from percolating into the ground or reaching the receiving waters.
    - Position all drainage/tanks, etc on concrete hard standing to prevent any seepage into ground.
    - Use of spill or drip trays to contain spills and leaks
    - Establish Guidelines and procedures for immediate clean up actions following any spillages of oil, fuel or chemicals.
    - Prepare standard operation procedures (SOPs) to manage any oil spills, leaks and/or seepages.
    - Train operating personnel on the SOPs.
    - Check and replace oil separators regularly

2. **Increased noise disturbances and vibration**

- Install portable barriers to shield compressors and other small stationary equipment where necessary.
- Well-maintained equipment to be operated on-site;
- Ensure regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components;
- Orientate equipment known to emit noise strongly in one direction so that the noise is directed away from receptors far as practicable; and
- Avoid transportation of materials on- and off-site through existing area

5. **Solid and liquid wastes generation and improper waste management**
    - Education to workers on site shall be undertaken to avoid, reduce and reuse wastes generated.
    - Sited and signpost waste storage facilities in the project site.
    - Manage and dispose all waste collected in accordance with the required regulations.
    - Dispose of waste by licensed contractors.

Socio-economic impact assessment

Positive impacts during construction phase

6. **Improved employment opportunities and local economy**

    Enhancement measures
    - Develop and implement a local recruitment and procurement management plan.
    - Consult with relevant stakeholders, including government authorities, especially mtaa and ward leaders in developing the local recruitment plan.
    - Inform mtaa and ward leaders of job opportunities in a timely manner.
    - Inform local businesses of contracting opportunities in a timely manner such as awareness on forthcoming investment and employment opportunities such as food vendors.

Positive impacts during operation phase

7. **Improvement in Quality, Reliability and Efficiency of power supplied**

Enhancement measures

- Ensure project is timely implemented to realize the benefits
- Increase income to the country
- Improve life standards of the people
- Ensure the growth of the city and town
- Enhance development activities like business and industries
- Lower electricity bills
- Reduce power losses
- Improve voltage to equipment

Mitigation and management of negative impacts construction phase

8. **Impact on community health and safety**

- Train all workers on the transmission routes and common symptoms of communicable diseases as well as sensitization of enforcement of HIV/AIDS law and regulations.
- Establish a workforce code of conduct. Include in the code specific measures on anti-social behaviour.
- Provide onsite health care
- Prepare emergency management procedures, should a health issue escalate and require a rapid response.
- Implement a grievance mechanism

.

Increased accidents, risks and hazards

- Provide and enforce proper use PPEs
- Provide health checks to the employees
- Provide training on relevant safety measures, first aid procedures and emergency response to workers.

- Provide full package of first aid kit at work places
- Monitor implementation of the training over time
- Provide safety signs
- Ensure regular maintenance of machines and equipment to minimize oil leakage
- Create awareness on all security and safety issues and hazards at the site
- Provide safety signs

9. Destruction of graves and graveyard

Mitigation measures

- Communicate closely with the affected families.
- Abide by the necessary cultural and legal procedures.
- Provide compensation as stipulated in the Abbreviated Resettlement Action Plan (ARAP)

10. Impact on Vulnerable households/population

Mitigation measures

- Provide Income Restoration Program for Vulnerable households
- Provide assistance on how to go through the compensation process.

11. Loss of residential structures

Mitigation measures

- Conduct land acquisition process in accordance with the Abbreviated Resettlement Policy Framework.
- Provide income restoration for those who will lose their livelihood due to land acquisition.
- Keep constant and open communication with PAPs and other stakeholders
- Provide assistance to vulnerable groups on how to go through the compensation process
- Set up a grievance mechanism to address any concern

- **Loss of public properties (Toilet facilities and Fencing)** Conduct land acquisition process in accordance with the Abbreviated Resettlement Policy Framework
- Keep constant and open communication with PAPs and other stakeholders
- Set up a grievance mechanism to address any concern

Mitigation and management of negative impacts operation phase

5.8. Impact on community health and safety

- Provide appropriate training for security personnel
- Monitor implementation of the training over time
- Create awareness on all security and safety issues and hazards associated with transmission line towers and substation.
- Construct fence around transmission line towers and substation.
- Provide safety signs.
- Implement a grievance mechanism

Increased accidents, risks and hazards

- Provide and enforce the proper use PPEs
- Provide health checks to the employees
- Provide training on relevant safety measures, first aid procedures and emergency response to workers.
- Provide full package of first aid kit at work places
- Monitor implementation of the training over time
- Provide safety signs
- Ensure Regular maintenance of machines and equipment to minimize oil leakage

7.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

7.1 Introduction

Through a systematic assessment, the EIA has identified a number of significant environmental and social impacts which may potentially result from the construction and operation of the Project. In order to manage and mitigate these impacts, a range of measures have been developed to reduce the overall residual impacts to acceptable levels and as low as reasonably practicable. Implementing and tracking the effect of these management and mitigation measures is an essential element to ensuring that the assessed residual impact levels are confirmed.

The key objectives of this Environmental and Social Management Plan (ESMP) are to:

- Collate the various mitigation and management measures developed throughout the EIA into a single point;
- Identify implementation mechanism (e.g. responsible entities, financing sources, monitoring and reporting requirements) to ensure actual implementation of all mitigation and management actions throughout the various phases of the Project;
- Define monitoring requirements to determine the efficacy of all mitigation and management measures; and
- Provide clarity to all stakeholders as to what impacts have been identified, how they will be mitigated and managed, and through what means.

7.2 Modalities of implementation of the ESMP

TANESCO, together with its contractors, will be responsible for ensuring that mitigation measures in the ESMP are implemented throughout the life span of the project. The modalities of implementation of the proposed ESMP will have to be agreed with TANESCO.

Learning from experience in other project that TANESCO is undertaking, the monitoring activities have been partly contracted to supervising consultants. In this modality TANESCO and supervising consultant establishes a kind of consortium or collaborative organization involving key staff on engineering, environmental and social components working closely with counterpart staff from TANESCO. Data and reports on monitoring activities are reviewed and approved by TANESCO while requirements of the financiers are taken on-board.

7.3 Overall roles and responsibility of the parties

The primary role and responsibility for implementation of the ESMP lies on TANESCO and its contractors. Regulators will have to make sure that the project proponent and the contractor are fully complying to the ESMP. In terms of the implementation of the recommended monitoring plan as described in Chapter 8, TANESCO staff will be responsible at the local implementation level, together with the Environmental Unit of TANESCO. TANESCO can as well hire consultant or any Institution to assist in implementation. Contractors will be responsible for implementation mitigation measures proposed in the plan and make sure they comply with the Tanzanian standards while considering requirements of financing agencies.

Based on the outcomes of the EIA, site specific detailed management plans are to be developed to guide TANESCO and its contractors in implementation of all mitigation and management measures. The detailed management plans will be leveraged by the contractors in developing their own management plans.

The role of the regulator, in this case NEMC, will be following up to ensure the conditions of the issued certificates as well as the issues pointed out in the ESMP are comprehensively implemented and addressed by the proponent. Similarly NEMC will be receiving self-monitoring reports covering compliance of the issues indicated in the ESMP.

7.3 Management plans

Mitigation planning involves undertaking activities during the design, implementation and operation phases of a project to eliminate, offset, or reduce adverse environmental impacts to acceptable levels. The proposed impact mitigation/enhancement plan for the project is summarized in Table 47. The developer has to set aside source of funds to deal with some of the mitigation measures before project implementation starts, as most of the mitigation activities need to be incorporated within the various stages of project implementation.

The developer must integrate the cost of implementing these mitigation measures into the overall project cost. However, since some of the measures are expected to be implemented by the relevant local and central government institutions, the cost for such measures will be borne by the relevant institutions and/or shared with the develop. For example, the need to improve and upgrade social services within the project area, provision of security organization and judiciary in order to allow the existing systems to cope with expected changes resulting from project implementation. The central government will be responsible for undertaking such measures.

Table 47: Environmental and Social Management Plan (ESMP) for the Proposed Kinyerezi T – Off Point to the New Mabibo Substation Transmission Line

Affected Aspect	Project Activity and Affected Area	Potential Impacts	Proposed Mitigation/Enhancement Measures	Responsible Entity	Costs
Site Preparation and Construction Phase					
Water Resources	Tower and substation construction	• Impact on surface and ground water quality	• Restrict the distance of towers away from the rivers and streams • Prohibit and enforce measures to minimize pollution of surface water • Avoid construction works/excavations during rainy season • Surround the storage areas for batteries and waste in substation and other storage areas with containment/spill control measure. • Position all drainage/tanks, etc. on concrete hard standing to prevent any seepage into ground. • Use of spill or drip trays to contain spills and leaks • Establish Guidelines and procedures for immediate clean up actions following any spillages of oil, fuel or chemicals. • Prepare standard operation procedures (SOPs) to manage any oil spills, leaks and/or seepages. • Train operating personnel on the SOPs. • Check and replace oil separators regularly	TANESCO	5,000 USD
Air	• Site clearance, site formation and levelling involving excavation and backfilling; • Construction of substations and transmission towers.	• Impact on local air quality	• Specify transport networks and locate stockpiles as far body parts of trucks at all exits of the construction site; • Control the height of unloading the fill materials during filling as far as possible; • Compact the reclaimed land immediately to avoid fugitive dust emissions; • Maintain and check the construction equipment regularly; • Switch off engines when not in use • Use sprinkle loose surface earth areas with water to keep dust levels down. • Use appropriate PPE (respratory masks) • Cover and contain construction materials in trucks and storage places • Confine project activities to core construction area	Contractor Engineer OSHA	15,000 USD

Affected Aspect	Project Activity and Affected Area	Potential Impacts	Proposed Mitigation/Enhancement Measures	Responsible Entity	Costs
Noise and Vibration	• Operation of construction equipment and machineries.	• Generation of noise and vibration	• Maintain equipment and vehicles to manufacturers' standards; • Limit operating times to daylight hours; • Close and turn off plants, compressor, generator and engine compartment doors when not in use; • Avoid use of particularly noisy plant early in the morning • Restrict the number of plant items in use at any one time; • Plant maintenance operations will be undertaken at distance from noise-sensitive receptors; • Reduce the speed of vehicle movements	TANESCO Contractor Engineer OSHA	5,000 USD
Wastes	• Wastes generated from construction sites	• Solid and liquid waste management	• Pursue the policy of Four R's – Recover, Recycle, Reduce and Reuse – to manage its waste. • Provide training to labourers for waste disposal in designated areas and use of sanitation facilities. • Implement proper storage of the construction materials and wastes to minimise the potential damage or contamination of the materials. • Segregate hazardous and non-hazardous waste and provide appropriate containers for the type of waste type. • Store waste systematically to allow inspection between containers to monitor leaks or spills. • Ensure that storage areas have impermeable floors and containment. • Dispose of waste by licensed contractors. • Provide adequate litter bins at work place • Treat and discharge waste water to meet Tanzania water quality standards • Raise awareness to workers/staff on environmental and safety issues • Connect to available urban liquid waste system or establish own treatment system in major cities and towns	TANESCO Contactor Engineer District/municipal engineer	30,000 USD
Employment	• Site clearance, site formation and levelling involving excavation and backfilling; • Construction of	Increased employment opportunities	• Develop and implement a local recruitment and procurement management plan. • Consult with relevant stakeholders, including government authorities, especially mtaa and ward leaders in developing the local recruitment plan. • Inform mtaa and ward leaders of job opportunities in a timely	TANESCO Contractor, Ubungo Municipal council	10,000 USD

Affected Aspect	Project Activity and Affected Area	Potential Impacts	Proposed Mitigation/Enhancement Measures	Responsible Entity	Costs
	substations and transmission towers.		manner. • Inform local businesses of contracting opportunities in a timely manner such as awareness on forthcoming investment and employment opportunities such as food vendors		
Community health, safety and security	Influx of workers into the area	• Potential increase in communicable and Sexually Transmitted Diseases (HIV/AIDS and STD's) and COVID 19 • Change in behaviour • Security issues	• Train all workers on the transmission routes and common symptoms of communicable diseases as well as sensitization of enforcement of HIV/AIDS law and regulations. • Establish a workforce code of conduct. Include in the code specific measures on anti-social behaviour. • Provide onsite health care • Implement measures for COVID 19 infections • Prepare emergency management procedures, should a health issue escalate and require a rapid response. • Implement a grievance mechanism	TANESCO Contractor, Ubungo Municipal council	20,000 USD
Accidents, risks and hazards	Site clearance, construction, maintenance and operation activities	• Risks to health and safety of workers on site	• Provide and enforce of the proper use PPEs • Provide health checks to the employees • Provide training on relevant safety measures, first aid procedures and emergency response to workers. • Provide full package of first aid kit at work places • Monitor implementation of the training over time • Provide safety signs • Ensure regular maintenance of machines and equipment to minimize oil leakage • Create awareness on all security and safety issues and hazards at the site	TANESCO Contractor Engineer OSHA Uungo Municipal Council District councils	10,000 USD
Cultural Heritage	Site preparation and construction activities	Destruction of graves/graveyard;	• Communicate closely with the affected families. • Abide by the necessary cultural and legal procedures. • Provide compensation as stipulated in the Abbreviated Resettlement Action Plan (ARAP	TANESCO Ubungo Municipal council	4,000 USD
Vulnerable people	Land acquisition	Loss of land and residential structure	• Provide Income Restoration Program for Vulnerable households • Provide assistance on how to go through the compensation process		10,000 USD

Affected Aspect	Project Activity and Affected Area	Potential Impacts	Proposed Mitigation/Enhancement Measures	Responsible Entity	Costs
Land and Residential Structures	Land acquisition	Loss of land and residential structure	• Conduct land acquisition process in accordance with the Abbreviated Resettlement Policy Framework • Provide income restoration for those who will lose their livelihood due to land acquisition. • Keep constant and open communication with PAPs and other stakeholders • Provide assistance to vulnerable groups on how to go through the compensation process • Set up a grievance mechanism to address any concern • Establish a grievance mechanism to address any concern	TANESCO Ministry of Land and Human Settlement Development, Ubungo Municipal council	300,000 USD
Operation Phase					
Water Resource	Accidental releases from operational activities at the sub station	• Impact on surface and groundwater quality	• Surround the storage areas for batteries and waste in substation and other storage areas with containment/spill control measure. • Position all drainage/tanks, etc on concrete hard standing to prevent any seepage into ground. • Use of spill or drip trays to contain spills and leaks • Establish Guidelines and procedures for immediate clean up actions following any spillages of oil, fuel or chemicals. • Prepare standard operation procedures (SOPs) to manage any oil spills, leaks and/or seepages. • Train operating personnel on the SOPs. • Check and replace oil separators regularly	TANESCO	20,000 USD
Noise and vibration	Machines operation during operation phase	Generation of noise and vibration	• Install portable barriers to shield compressors and other small stationary equipment where necessary. • Well-maintained equipment to be operated on-site; • Ensure regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components; • Orient equipment known to emit noise strongly in one direction so that the noise is directed away from receptors far as practicable; and • Avoid transportation of materials on- and off-site through existing area		

Affected Aspect	Project Activity and Affected Area	Potential Impacts	Proposed Mitigation/Enhancement Measures	Responsible Entity	Costs
Wastes	Wastes from control room and substation	• Generate solid and hazardous wastes	• Educate workers on site to avoid, reduce and reuse wastes generated. • Site and signpost waste storage facilities in the project site. • Manage and dispose all waste collected in accordance with the required regulations. • Dispose of waste by licensed contractors.	TANESCO	5,000 USD/year
Power supply	Project operation	Increased power supply	• Increase income to the country • Improve life standards of the people • Ensure growth of the city and town • Enhance development activities like business and industries • Lower electricity bills • Reduce power losses • Improve voltage to equipment	TANESCO	5,000 USD
Community Health, Safety and Security	Presence of new infrastructure	• Onsite accidents and injuries	• Provide appropriate training for security personnel • Monitor implementation of the training over time • Create awareness on all security and safety issues associated with transmission line towers and substations • Construct fence around transmission towers and substations. • Provide safety signs • Implement grievance mechanism	TANESCO	50,000 USD
Accidents, risks and hazards	Construction, Maintenance and operation activities	• Risks to health and safety of workers on site	• Provide training on relevant safety measures, first aid procedures and emergency response to workers. • Provide full package of first aid kit at work places and workers' camps • Provide and enforce the proper use PPEs • Provide health check to the employees • Provide training on occupational health and safety • Monitor training over time • Provide safety signs	TANESCO Contractor	50,000 USD

Source: EARG Study Team, 2018

8.0 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

8.1 Introduction

This chapter provide an environmental and social monitoring plan for the proposed transmission line from Kinyerezi T off point to New Mabibo Substation. The mitigation plan and the monitoring plan together constitute the Environmental Management Plan (EMP) for the proposed development.

Monitoring refers to the systematic collection of data through a series of repetitive measurements over a period of time to provide information on characteristics and functioning of environmental and social variables in specific areas over time. Monitoring must include checking for effectiveness of mitigation and enhancement measures to deal with the predicted impacts of a particular project.

EMA No. 20 of 2004 defines roles for monitoring where the National Environment Management Council (NEMC) is empowered to enforce compliance to the environmental permits (Certificate) issued prior to development and follow in monitoring to ensure implementation of the Environmental Management Plans (EMP). NEMC therefore is required to conduct monitoring activities in collaboration with relevant sectors and other stakeholders.

There are different types of monitoring conducted in various project undertaking, these include;

- Baseline monitoring: the measurement of environmental parameters during a pre-project period and operation period to determine the nature and ranges of natural variations and where possible establish the process of change. Baseline monitoring for this project would entail observation of the types and rate of changes on the baseline conditions that has been identified in Chapter 4 which represent conditions prior to the start of the project.
- Impact/effect monitoring: involves the measurement of parameters (performance indicators) during construction, operation and decommissioning phase in order to detect and quantify environmental and social change, which may have occurred as a result of the project.

- Compliance monitoring: takes the form of periodic sampling and continuous measurement of levels of compliance with standards and thresholds – e.g. for waste disposal, air pollution, noise and vibration level. The monitoring for this project would mean collecting data on key parameters and compare them with national and international standards as provided in this report or other government notices.
- Mitigation monitoring aims to determine the suitability and effectiveness of mitigation measures and programmes, designed to diminish or compensate for adverse effects of the project. In this project, monitoring for this component would entail auditing the effectiveness of the mitigation measures to ascertain whether changes are needed to enhance best practices.

8.2 Monitoring Plan

Monitoring is a means verifying overall effectiveness of the management and mitigation measures contained within the management plans described in Chapter 8. Key objectives of the monitoring process are to:

- Confirm effectiveness of management and mitigation measures;
- Ensure compliance with Applicable Standards (i.e. Tanzanian standards, JICA Guidelines, World Bank Safeguard Policies and IFC EHS Guidelines);
- Monitoring the status of, and impacts on, identified sensitive receptors;
- Provide an early warning that any of the control measures or practices are failing to achieve their desired performance and ensure changes can be implemented to remedy these practices;
- Determine whether environmental and social changes are attributable to Project activities, or as a result of other activities or natural variation; and
- Provide a basis for continual review and improvements to Project design and execution.

Biophysical and social environmental management components of particular significance have been identified as indicators. A monitoring plan for each indicator has been prepared for all phases of the Project and is presented in Table 48.

This includes the tentative parameters to be measured, methods to be utilised, sampling locations, frequency of measurements, detection limits, cost and responsibilities for implementation and supervision.

8.3 Reporting arrangement

The reporting system will ensure regular flow of information from the Project site to the Project headquarters/TANESCO head office and, as necessary, to regulatory authorities and financing entities. The reporting system will provide a mechanism to ensure that the measures proposed in the Project's ESMP are implemented.

Prior to the commencement of the construction activities, the project proponent will finalise the format and frequency for reporting on the status and progress of environmental and social monitoring. Records of monitoring results should be kept in an acceptable format an easily accessible, and information reviewed and evaluated to improve the effectiveness of the environmental management plan. The results should be reported to the responsible authorities and relevant parties, as required by NEMC.

Table 48:Environmental and Social Monitoring Plan for the Proposed Transmission Line from Kinyerezi T – Off Point to the New Mabibo Substation

Project Stage/ Affected Component	Potential Impact	Parameters to be monitored	Location	Means of verification/Measurements	Frequency	Responsibility	Cost (USD)
Site Preparation and Construction Phase							
General	Inspection of mitigation compliance	General compliance with mitigation measures presented in the ESMP	Project activity areas and construction workers camp	Visual inspection of all active work areas	Daily	TANESCO	10,000USD
Water Resource	Impaired groundwater quality	pH, temperature, EC, TDS, turbidity, total hardness, Cl, SO4+, NO3-, BOD, COD, Total Coliforms and heavy metals (As and Pb) Refer: IFC General EHS Guidelines: 1.3 Wastewater and Ambient water quality Presence/absence and use of approved chemicals Incidence of water/soil pollution/contamination Presence/absence of functional oil traps and skimmers Presence /absence of schedule of maintenance	Neighbouring wells and boreholes	Standard analytical methods Field inspection, measurements and reports	· Before construction activity starts · Upon request from nearby residents.	TANESCO	10,000 USD

Project Stage/ Affected Component	Potential Impact	Parameters to be monitored	Location	Means of verification/Measurements	Frequency	Responsibility	Cost (USD)
		Level of pollution as per TZS 860:2006					
Ambient Air	Dust Generation	Dust Refer: Air Quality Standards Regulations in Tanzania IFC General EHS Guidelines: 1.1 Air Emission and Ambient Air Quality	village(s) close to access roads	Visual inspection Reports	Upon request	TANESCO	5,000USD
Noise	Noise generation	Noise levels Refer: Noise Standard Regulations in Tanzania IFC General EHS Guidelines: 1.7 Noise	Site described in the request	Noise level measurement	Upon Request	TANESCO	10,000 USD
Waste	Solid waste management	Adequacy of solid waste management measures (e.g. appropriate storage, collection and disposal) Presence /absence of functional mobile toilets, soak away /septic tanks systems Presence/absence and types of solid waste within the wayleave	Waste storage areas	Visual inspection of all waste collection sites, and confirmation of proper disposal		TANESCO	5,000 USD

Project Stage/ Affected Component	Potential Impact	Parameters to be monitored	Location	Means of verification/Measurements	Frequency	Responsibility	Cost (USD)
		Presence /absence of coded solid waste collection bins Presence/absence of functional disposal facility Presence/absence of recycling facilities Presence/absence of functional program to reduce and recover solid wastes		Field inspection and reports	Weekly		
Employment opportunities	Increased employment	Number and gender of local people employed Presence/absence of worker's training programmes Number of workers trained based on skills Type of support provided	Affected communities	Reports and surveys	Biannual during mobilization, construction and operation	TANESCO and Ubungo municipal council	5,000 USD
Land and Residential	Loss of land and residential structure	Number of meetings and types of	Affected		In tandem with mobilization	TANESCO Municipal Land	5,000 USD

Project Stage/ Affected Component	Potential Impact	Parameters to be monitored	Location	Means of verification/Measurements	Frequency	Responsibility	Cost (USD)
Structures		information disseminated Number of affected persons compensated at full replacement cost Presence/absence of functional grievance redress mechanism Number and type of complains Incidences and extent of project activities outside the core designated area	communities		and construction	Officer Chief valuer	
Community Health and safety	Increase risks, hazards and accidents	Accidents, incidents and complaints	Affected communities	Incidents, accidents and community complaints	Based on occurrence	TANESCO	5,000 USD
Accidents, risks and hazards	Increased risks, hazards and accidents	Presence /absence of training programmes Number of certified trained staff on safety measures Presence /absence of full packaged and functioning first Aid Kits Presence/absence of appropriate functional PPEs Presence/absence of	Project activity areas and construction workers camp	Field inspection, measurements and reports	Quarterly during mobilization, construction	TANESCO	5,000 USD

Project Stage/ Affected Component	Potential Impact	Parameters to be monitored	Location	Means of verification/Measurements	Frequency	Responsibility	Cost (USD)
		Company enforcement policy Presence/absence of warnings signs Presence/absence and use of approved chemicals Near-misses, incidents, occupational diseases, dangerous occurrences					
Operation Phase							
General	Inspection of mitigation compliance	General compliance with mitigation measures presented in the ESMP and operational manual	Project activity areas	Visual inspection of all active work areas	Daily	TANESCO	5,000 USD/year
Waste	Solid waste management	Appropriate collection, transport and management	Waste collection sites in substations	Visual inspection of all waste collection sites and confirmation of proper disposal	Monthly	TANESCO	5,000 USD/year
Community Health and safety	Increase risks, hazards and accidents	Accidents, incidents and complaints	Affected communities	Incidents, accidents and community complaints	Based on occurrence	TANESCO	5,000 USD/year

Project Stage/ Affected Component	Potential Impact	Parameters to be monitored	Location	Means of verification/Measurements	Frequency	Responsibility	Cost (USD)
Accidents, risks and hazards	Increase risks, hazards and accidents	Near-misses, incidents, occupational diseases, dangerous occurrences	Project activity areas and construction workers camp	As defined in construction phase Health & Safety Plan to be prepared by the contractor	As defined in H&S Plan	TANESCO	5,000 USD/year

Source: EARG Study Team, 2020

9.0 COST AND BENEFIT ANALYSIS

JICA Study Team has worked out the economic analysis for the Project for Reinforcement of Supply from Kinyerezi Power Station. In order to select the most feasible option, six alternatives were comparatively analyzed on the basis of technical, economic and social-environment criteria. Those six alternatives are presented in detail in Table below.

Alternatives	Major Components
Alternatives - 1 (Alt-1)	1. Construction of Mburahati substation (220/132 kV, 200 MVA Transformer×2) 2. 220 kV Kinyerezi – Mburahati TL-2cct which are hung on 2cct towers (Approx. 20 km)
Alternatives - 2 (Alt-2)	1. Construction of Mburahati substation (220/132 kV, 200 MVA Transformer×2) 2. 220 kV Kinyerezi (T-off point) – Mburahati TL-1cct which are hung on 1cct towers (Approx. 12 km)
Alternatives - 3 (Alt-3)	1. Construction of Mburahati substation (220/132 kV, 200 MVA Transformer×2) 2. 220 kV Kinyerezi – Kinyerezi (T-off point) TL-1cct which are hung on 1cct towers (Approx. 8 km) 3. 220 kV Kinyerezi (T-off point) – Ubungo TL-1cct and Kinyerezi (T-off point) – Mburahati TL-1cct which are hung on 2cct towers (Approx. 7 km) 4. 220 kV Ubungo – Mburahati TL-1cct and Kinyerezi (T-off point) – Mburahati TL-1cct which are hung on 2cct towers (Approx. 5 km)
Alternatives - 4 (Alt-4)	1. Construction of Mabibo substation (220/132 kV, 200 MVA Transformer×2) 2. 220 kV Kinyerezi (T-off point) – Ubungo TL-1cct and Kinyerezi (T-off point) – Mabibo TL-2cct which are hung on 3cct towers (Approx. 7.0 km) 3. 220 kV Kinyerezi (T-off point) – Mabibo TL-2cct which are hung on

	2cct towers (Approx. 2.0 km) 4. 220kV Kinyerezi-LuguruniTransmission line (2cct and double conductor, Approx. 15km)
Alternatives - 5 (Alt-5)	1. Construction of Mabibo substation (220/132 kV, 200 MVA Transformer×2) 2. 220 kV Kinyerezi (T-off point) – Ubungo TL-1cct and Ubungo – Mabibo TL-1cct which are hung on 2cct towers (Approx. 7.0 km) 3. 220 kV Ubungo – Mabibo TL-1cct and Kinyerezi (T-off point) – Mabibo TL-1cct which are hung on 2cct towers (Approx. 2.0 km) 4. Reinforcement of one 220/132 kV transformer (150 → 300MVA) at Ubungo substation
Alternatives - 6 (Alt-6)	1. Construction of Mabibo substation (220/132 kV, 200 MVA Transformer×2) 2. 220 kV Kinyerezi (T-off point) – Ubungo TL-1cct and Kinyerezi (T-off point) – Mabibo TL-2cct which are hung on 3cct towers (Approx. 7.0 km) 3. 220 kV Ubungo – Mabibo TL-1cct and Kinyerezi (T-off point) – Mabibo TL-1cct which are hung on 2cct towers (Approx. 2.0 km)

The assessment period of the economic analysis is 30 years. The lifespan of the line is expected to be 50 years and the lifespan of the equipment is 30 years. The overall investment costs have been calculated.

In the economic analysis, the future benefits have been discounted using a 12 % rate in order to compare the Net Present Value (NPV) of the benefits over the 30 years.

The NPV of the benefits has been calculated on the basis of the following components;

i. Electric supply capacity
ii. Willingness to pay
iii. Submission Cost
iv. Transmission Line cost
v. Operation and management (O&M) cost

The value of Willingness to pay is estimated 0.014 USD/kWh, and the operation and

management (O&M) costs have been estimated at 0.5%.

The project assumes consideration of two options (Alt-4 and Alt-6) which are narrowed down in terms of cost, technical and reliability terms etc. as follow.

Option 1 (Alt-4) - Mabibo substation is commissioned in 2025, with 3 years of construction. The corresponding investment is 3% in 2022, 60% in 2023 and 37% in 2024.

Option 2 (Alt-6) - Mabibo substation is commissioned in 2025, with 3 years of construction. The corresponding investment is 3% in 2022, 57% in 2023 and 40% in 2024.

The Economic Internal Rate of Return (EIRR) is the value of the discounted rate for which the NPV of the project is zero. The EIRR for the two options is around 20% hence considered appropriate.

The benefits were discounted from year 2054 to 2025. The NPV of the two options take into account the investment, RAP and EISA cost, the Operation and Management cost. The summary of EIRR and NPV is shown in the table below.

Indicators	Option 1 (Alt-4)	Option 2 (Alt-6)
EIRR (%)	17	17
NPV (million USD)	21.73	21.26

Resultantly, Option 1 (Alt-4) proved to be slightly more economical, and which comprehensively outweighs other alternatives when compared on economic aspects. However, Alternative-4 has the following challenges. Firstly, Alternavie-4 has more dependence on Kinyerezi – Luguruni lines compared to Alternative-6. Secondly, Kinyrezi - Luguruni lines cannot be covered by Japan's grant aid due to budgetary limitation. If the Project depends on the progress of Kinyerezi-Luguruni lines, the delay of the lines may cause the delay of the Project. In addition, Alernative-4 does not have a direct link between Kinyerezi and Ubungo, this may negatively affect power evacuation from Kinyerezi power station. Ubungo will continue to be the hub of power supply to Dar es Salaam even if the second grid substation, Mabibo commences operation, while Kinyerezi is the largest power source in Dar es Salaam and Coast regions. Those two important points needs to have direct and shortest link to achieve reliable and sufficient power supply.

Due to the situation above, TANESCO selected Option 2 (Alt-6) as the most feasible option. The proposed project will positively contribute to revitalize the industries and economic activities in Dar es Salaam and improve stable operation of public welfare facilities and healthcare services as well as the living environment of local residents.

10.0 DECOMMISSIONING PLANS

This EIA report has mainly focused on the potential impacts and associated mitigation measures during the construction and operation phase. This section deals with the decommissioning phase of the proposed project. Decommissioning is a stage where the project or activity of the project is formally ending.

The proposed transmission line system is expected to operate for at least 40 years before it comes to an end. The Regulations for Environmental Impact Assessment (URT, 2005) directs developers to address the implication of decommissioning process as part of the EIA process.

There will be some components of the project that will be closed as soon as their requirement has come to the end. Activities to be done during decommissioning include, stakeholders consultation, pre-decommissioning activities and decommissioning activities which will include demolition of power plant and hauling rubble and waste materials from the demolition. Several impacts (negative and positive) are likely to occur as result of the decommissioning.

10.1 Stakeholder's consultation for decommissioning

The project-decommissioning plan will include consultation with various stakeholders including host communities, nearby facility owners, regulatory bodies and experts. As the Project approaches the end of its economic viability, plans will be put in place to wind down operations and maintenance. This will allow for a carefully planned redeployment and, where necessary, disengagement of personnel as appropriate.

10.2 Pre-decommissioning activities

Prior to engaging in decommissioning works, the proponent will develop a decommissioning plan in accordance with regulatory requirements at the time of decommissioning. Decommissioning and restoration activities will be performed in accordance with all relevant statutes in place at the time of decommissioning.

10.3 Decommissioning activities

In implementing decommissioning activities, TANESCO will prepare a detailed decommissioning plan to ensure that environmental and social impacts are minimized in order to comply with environmental legislations and policy requirements. In decommissioning phase, TANESCO will form a team of experts with a representative from the relevant national, regional and local government bodies to monitor the implementation of the decommissioning plan.
At the end of the facilities utility, all equipment will be decommissioned. In general, the activities to be carried out during the decommissioning phase shall include the following:

i. Dismantling of towers including excavation
ii. Dismantling of all surface equipment including conductors and grounding wires
iii. Removal and disposal of concrete works
iv. Removal and disposal of conductors, etc

10.4 Impacts and mitigation measures

The potential impacts that might result from the decommissioning phase of the proposed project include:

i. Physical disturbance of the environment arising from the removal of the towers and ancillary equipment,
ii. Potential hazards/accidents associated with decommissioning activities, and
iii. Waste management problems

The strategy to be adopted for site remediation shall depend on the prevailing biophysical and social environmental attributes and the attendant impacts that may result from such an action as discussed in Chapter 6. The following measures need to be planned for implementation after decommissioning:

- Facilities and ancillary equipment shall be dismantled completely
- All equipment and debris shall be removed from the environment
- Good waste management plan shall be implemented.

iv. **Noise and vibration:** Sources of noise during decommissioning would be similar to those during construction and would be caused primarily by construction equipment

and vehicular traffic. Noise and vibration will occur as a result of movement of heavy vehicles and machines hauling rubble and waste materials from the demolition. Vibration may cause effect on nearby structures especially community's houses. The following mitigation measures are suggested:

- TANESCO/Contractor to ensure all decommissioning activities is confined to core areas.
- TANESCO to ensure there is no unnecessary movement of vehicle.

v. **Air Quality:** Emissions generated by activities during the decommissioning include vehicle emissions; diesel emissions from large construction equipment and generators; and fugitive dust from many sources such as structure removal, backfilling, dumping, reclamation of disturbed areas (grading, seeding, planting), and truck and equipment traffic.

vi. **Soil Erosion**: This is likely to occur during decommissioning as result of movement of vehicles heavy machines clearing the structures and leveling the project area. The following mitigation measures are proposed:

- TANESCO/Contractor must to all decommissioning activities are confined to core areas.
- TANESCO/Contractor to rehabilitate degraded areas with natural vegetation.

vii. **Surface run off and surface water quality**: This is likely to occur during decommissioning and especially if it is done during the rainy season. Surface run off may accelerate soil erosion and increase pollution of water bodies. The following mitigation measures are proposed:

- TANESCO/Contractor to ensure all decommissioning activities is confined to core areas.
- TANESCO/Contractor to schedule decommissioning to be scheduled during dry season.
- TANESCO/Contractor to ensure spoil material from demolished infrastructure is appropriately disposed away from wetlands, water sources.
- TANESCO/Contractor to undertake site landscaping in disturbed areas.

viii. **Waste generation**: The decommissioning of the transmission line will result into generation of wastes from obsolete materials and unwanted materials. Mechanisms of identifying, collecting and disposal will be in place to ensure all wastes have been collected, removed and rightly disposed of. The following mitigation measure is proposed:

- Equipment and facilities of the substations, transmission towers and lines will have to be disposed-or removed from the project site.
- Assessing the contents of hazardous materials in control building and substations.
- Removing them prior to initiation of decommissioning activities, managing their treatment and disposal.
- Cleaning of zones where necessary

ix. **Human Health and Safety:** Potential impacts to worker and public health and safety during decommissioning and site reclamation would be similar to those during construction; and relate to earthmoving, use of large equipment, dismantling of industrial components, and transportation of overweight and oversized materials.

x. **Land Use:** Upon decommissioning, land use impacts resulting from construction and operation of the power transmission project could be largely reversed depending on the end use selected for the RoW.

xi. **Socio-economics:** Direct impacts would include the creation of new jobs for workers during decommissioning.

xii. **Transportation:** Short-term increases in the use of local roadways would occur during decommissioning and site reclamation. Overweight and oversized loads could cause temporary disruptions to local traffic.

xiii. **Water Resources:** Water would be used for dust control for road traffic, dismantling of towers, substations, and other buildings, and for consumptive use by the construction crew. It might be trucked in from off-site or obtained from local groundwater wells or nearby surface water bodies, depending on availability.

11.0 SUMMARY AND CONCLUSION

In accordance with the requirements of the Environmental Management Act, Cap 191 of 2004 and the Environmental Impact Assessment and Audit Regulations of 2005, this EIA Report has been prepared to identify, assess, and mitigate the potential environmental and social impacts associated with the proposed 400kV transmission line. This Report was based on the technical information provided by the developer, existing studies and reports relevant to the Project, site visit, baseline environmental monitoring and the initial stakeholder engagement.

The proposed Kinyerezi T – Off Point to the New Mabibo Substation transmission line route is located in Dar es Salaam Region in Ubungo Municipality. The proposed development of power transmission line from Kinyerezi T – Off Point to the New Mabibo Substation traverses within covering four wards and seven mtaas, namely Kimara (Mavurunza, Kilungule A and Kilungule B), Makuburi (Kibangu), Ubungo (Kibo and Ubungo Kisiwani) and Mabibo where the substation will be located.

The potential impacts have been identified and evaluated for the project on the existing environment (biophysical, social and health). Mitigation measures have been recommended for unavoidable impacts considered significant, to reduce the rating of their identified adverse effects to levels as low as reasonably practicable. Recommendations have also been made to enhance the benefits of the identified positive impacts. A project-specific Environmental and Social Management Plan (ESMP) for assessing the effectiveness of the mitigation measures in controlling identified significant impacts has been recommended.

The EIA has shown that with the implementation of the recommended mitigation measures embodied in the Environmental and Social Management Plan could be executed and decommissioned with minimal adverse impacts on the environment. The Projects will result in substantial economic benefits to the Dar es Salaam economy and Tanzania in general through increased electric power transmission and distribution. The local communities shall also benefit immensely from the project through employment opportunities and increased financial flows

from supply of materials and contracts as well as community development projects that TANESCO will be committed to put in place.

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13.0 ANNEXES

13.1 Terms of References for Undertaking Environmental Impact Assessment for the proposed construction of 9km of 220kv Transmission line from Kinyerezi T – Off Point to the New Mabibo Substation, Dar Es Salaam

Background of the Project The Government of Tanzania in collaboration with the Japan International Cooperation Agency (JICA) through Tanzania Electric Supply Company Limited (TANESCO) are in the plan to construct a new 220kV transmission line from Kinyerezi T-off Point to the new 220/132kV substation near Mabibo area. This unique project will involve construction of a new substation and triple circuit towers from Kinyerezi T-off point to Ubungo substation (7km) and double circuit towers from Ubungo substation to Mabibo substation (2km). The proposed transmission line is estimated to cover a distance of 9km. The project will utilize existing way-leave of Morogoro two (MG2) and existing Ubungo Ilala way-leave on the second portion of the line, the new substation will be constructed on the existing way-leave corridor near Mabibo market and National Institute of Transport (NIT). Therefore, no new land will be acquired for construction of the transmission line and the substation; rather the existing transmission line will be demolished and replaced with the new one. However, the MG2 wayleave was acquired long time ago since 1960s before EMA came into force; the project has no EIA certificate which is the same to the Ubungo – Ilala wayleave.

The project is expected to utilize the wayleave of 60m that is 30m from both sides of the centerline. The preliminary survey reveals that, there are several ongoing human activities at the project site. It was noted that the area near Ubungo substation has few residential houses and few mobile shops which will be affected during project construction. Although these activities are done illegally since the wayleave is the property of TANESCO but it was found important to seek the best way to deal with them. These includes graveyards near Ubungo Maziwa and in Kimara Mavurunza, few mobile shops and small vegetable gardens near Urafiki textile industry and few pedestrian ways.

Gas pipelines and water pipelines were found using the same corridor however; a detailed report will be prepared by the responsible parties i.e. DAWASCO and TPDC to avoid damage to existing infrastructure. Since the line is planned to use existing wayleave the environmental and social impacts are expected to be minimum however, proper attention including stakeholder's engagement is of paramount important. The site can be reached through existing nearby road infrastructures this includes Mandela and Maziwa roads in Ubungo and Kimara Mavurunza road on Kimara side.

Rationale of the project

Dar es Salaam is a fast growing city in Tanzania in terms of social and economic development. The fast growth of the city is the result of a number of factors that include expansion of industrial base within the city, population growth, development of new structures including tall buildings and expansion of transport infrastructures such as railway (SGR), road network and expansion of Julius Nyerere International Airport terminal three among others. The combination of economic growth, housing and population growth, income growth and social development have all contributed to the increased demand for electricity consumptions hence requiring reliable supply of power. Ubungo Substation is mostly considered as the mother or primary grid substation to supply power to the other substations around the city. Ubungo Substation is receiving 220kV from MG1 and MG2 lines, and from the following power plants: Kinyerezi (220kV), Ubungo one (220kV), Ubungo two (132kV) and Songas (132kV) and then supplying power to other substation in Dar es Salaam.

The overdependence on Ubungo Substation has sometimes brought difficulties in planning for maintenance services and any technical problems can result to collapse of the national grid. Therefore, the construction of new Mabibo 220/132kV substation will reduce overdependence to Ubungo substation and ensure power security to the national grid and to the city of Dar es salaam. By considering the unforeseen impacts to the national grid that might arise from any technical failure on Ubungo Substation the construction of new Transmission line and the substation to evacuate power from Kinyerezi Power plant is of vital importance.

Project Components

The proposed project will involve construction of a new substation and triple circuit towers from Kinyerezi t-off point to Ubungo substation (7km) and double circuit towers from Ubungo substation to Mabibo substation (2km). The major components of this project are 220/132KV Substation and Transmission line.

Transmission Lines

The Transmission line consisting of series of towers of different type and insulator will run a total length is 9km with 220/132kV triple circuit conductors from Kinyerezi T-off point to Ubungo Substation (7km) and double circuit conductors from Ubungo S/S to Mabibo area (2km). Since there is no designed standard for way leave size for triple circuit conductors and towers it was recommended to use 40m size ROW which will cover 20m wide on the both sides from the centerline however, the size might change to suit the project design. The proposed transmission and substation will utilize the existing way leave to avoid relocation of people and expensive compensation therefore No additional land will be acquired for the proposed project.

Substation

The project will involve construction of new 220/132kV substation at Mabibo area near to the Institute of Transport (NIT). The new 220/132kV substation is proposed to have 200 MVA transformer x2 of hybrid type, the substation is designed within the area of 50m x 500m. The substation area is planned to be within the ROW of transmission line between Mabibo Market and compound of National Institute of Transport. No addition land acquisition is expected for the substation. Facilities expected at substation are control building with switch gear, transformers, reactors and officers. Materials and Other Utilities.

Materials and Other Utilities

Matrials required includes materials for civil works (foundation for transformers and reactors), transformers and reactors. Other utilities required include protection systems are needed for main and back-up in case of unexpected system failure, Communication and SCADA System and Firefighting System.

Project Activities

As part of project implementation, this project will involve several activities categorized into different phases as explained below:

Mobilization phase

The project activities during mobilization phase include mobilization of human resources, designing of the structures, obtaining various permits that include environmental permits, mobilization of resources, and importation of machinery and purchase of various construction materials. Mobilization entails establishing work camp and offices on the site, assembling equipment, construction work force as well as materials. Work camp will be established to provide shelter and storage facilities for construction material, fuel and lubricants, workshops, logistics and offices for less than 5 months during the construction period.

Construction Phase

The Construction phase will include excavation of tower foundations, erecting the towers, stringing of conductors and securing the site and construction of facilities for the substations and transformers as needed. Machines and manual labor will be involved in the construction phase. Some areas will require preparation of the access roads to bring equipment, workforce and

materials to the designated sites. Appropriate measures for mitigation will be considered according to the Environmental Management Plan (EMP). Some labor forces may be recruited from local communities - especially for the simple and manual operations that could easily be accomplished using local skills. The construction phase is estimated to take roughly about 12 to 24 months.

Operation Phase

During operation, the power line will function as required with monitoring, repair, and maintenance of the transmission line and substation and taking corrective actions in case of accidents and emergencies. Maintenance of 220 kV transmission line, safety management of the line maintenance and safeguard of the RoW will be done in the operation phase Decommissioning Phase When the transmission line and substation becomes unusable from reasons, decommissioning of the transmission line and substation may be carried out in the EMP to be made as a part of the Environmental Impact Assessment report. The main issues of concern will be removal and handling of cleared materials. Others issues include noise and dust level due to demolition of structures and restoration of the area. Decommissioning will involve the demolition of the structures and rehabilitating the land on which the structures were established to its original condition.

Objectives of the Terms of Reference

The objective of these Terms of Reference (ToR) is to ensure a comprehensive and participatory Environmental Impact Assessment (EIA) for the proposed development is undertaken. The ToR outlines activities, methodology to be followed and expected output.

Activities to be undertaken in this EIA

A multi-disciplinary team will undertake full EIA addressing the following activities: Task 1 Project Description: The consultant will give details of the following:

i. Activities to be carried out in each phase of the project;
ii. The purpose and objectives of the proposed development should be clearly stipulated;
iii. Adequate description of size, scale and design of the project;
iv. Types and quantities of material and inputs needed during mobilization, construction and operational phases;
v. The types and quantities of wastes and residual materials and the rate at which these will be produced;
vi. The description of methods used to make estimations of waste generated, and the proposed methods of waste treatment and disposal;

vii. Estimated Project capital cost and source of funds.

Task 2: Description of the Environment (baseline data)

Under this task the consultant will give description of:

i. The location and area of land affected by the development. This should also be on maps and the current land uses of the area should be clearly identified;
ii. Definition of project-affected site should be broad enough to include any potential effects occurring away from the construction site (e.g. dispersal of pollutants, traffic, changes in channel capacity of water sources as a result of increased surface run of etc.); Key areas to be covered include:

(A) Physical Environment

- Land use/Land Cover pattern will be assessed, covering the project area. Information regarding land use classification of the study should be collected, Land use patterns to cover areas of influence identified during scoping phase and information on water bodies, and sites with historical/archaeological significances, should be collected;
- Geography and geomorphology data should be collected from secondary and primary sources to cover soils, geography and the geomorphology of the project area;
- Climate and Meteorology information from secondary sources to provide historical trends (10years) from the nearest meteorological station. This data should cover hourly wind direction, hourly wind speed; hourly precipitation, hourly mean temperature, hourly humidity and sunshine hours and hourly clouds.
- Natural Hazards disasters information to be collected from secondary sources for the past 30 years – e.g., floods, landslides, earthquakes, drought, storm, storm surge, wildfire etc
- Hydrology and water use – information from secondary sources to cover catchments, rivers, and hydrology along the transmission line.

(B) Ecological Environment

- Items to be covered under this component include flora and fauna that will require ecological survey of the study area to collect primary information on terrestrial flora and fauna in the study area including rare, threatened and endangered species. Collection of the existing and available information (secondary data) will also be undertaken. Any possible changes to be caused by the project must be identified. Information must include identification of flora and fauna types and status, identification of sensitive areas such as habitats with important ecological

values and confirmation of identified species with Tanzania and IUCN Red List and legal status. Identification of these species will provide baseline data for future monitoring of the impacts of the proposed transmission line

(C) Socio-economic Environment

Items to be covered under this component include ethnicity, vulnerable people (women, elderly, disabled, children as described in JICA guidelines for environmental and social considerations), and population by age groups, industries, NGOs, sanitation, diseases such as HIV/AIDS, infrastructure, and gender. The livelihood of the people in the project areas depend on access to these resources, profiling of the resources should be made to provide the link between them and those resources and how the project will impact them.

- Demographic profile – using secondary data sources describe population trends, age and occupation and marital status.
- Educations and literacy and status of institutions;
- Economic activities and livelihood patterns - using secondary data describe status and condition regarding industrial activities (of all types and sizes), employment, incomes and livelihood expenditure, land ownership and tenure;
- Socio-economic infrastructure and indicators – using secondary data sources describe status and condition of housing and settlement, education infrastructure, health service delivery and infrastructure, water supply and sanitation. Others are waste disposal facilities and systems, transport and communication, energy and utilization and any other social infrastructure available and which might be affected by the project.
- Resettlement - for the purpose of preparing Abbreviated Resettlement Action Plan (ARAP), identify and document potential properties (public and private) that may be affected by the project, estimate general values, identify rough estimates of affected persons and their socio-economic characteristics.

Task 3: Legislative, policies and administrative framework

Review relevant legislatives and policies applicable to the project. The review shall cover but not limited to:

- National policies, laws, regulation and standards,
- International conventions, treaties, agreements relevant to the project, including labour and human right treaties
- Institutional framework, jurisdictions and responsibilities for project implementation,
- Undertake gap analysis and comparison between national/local and International guidelines or standards such as those from JICA and suggest how gaps can be filled.

Task 4: Stakeholder Consultations

- Relevant stakeholders will be identified for consultations;

- Show in the EIA report how the views and concerns of the stakeholders have been addressed;
- Consult with all relevant stakeholders including project affected persons and different groups and categories;
- Ensure attendance to meetings and any other form of consultations is documented and signed off by the stakeholders as required by law;

Task 5: Identification, Prediction and Analysis of Impacts

For items identified in the scoping process, impact will be studied and estimated for the transmission line construction stage, operation and maintenance stage and decommissioning stage. In addition, quantitative analysis will be made where possible. The EIA study will evaluate the significance of environmental impacts associated with the proposed Project.

- Selection of impact identification tools must be done with the view to identify all critical impacts, based on the baseline information. A Range of tools exist that can be used including but not limited to checklist, networks diagrams, matrices, professional experiences etc.
- Develop prediction scenarios: This should cover a range of impacts including for example, (i) Noise quality and vibration from sources such as movement of vehicle delivering construction material and (ii) potential negative impacts and benefits socioeconomic impacts due to the proposed project. In addition, address the following key aspects:
  a. The methodology used to identify and analyse likely impacts (both negative and positive) will be clearly outlined.
  b. Consider impacts, in terms of positive or negative, short or long terms, permanent or temporary, direct or indirect and reversibility.
  c. The logic used to identify the key impacts on human beings, flora and fauna, soil, water, air, climate, landscape, cultural heritage, or their interaction, will be explained.
  d. A clear statement of the residual impacts and their significance will also be provided.
  e. Consideration for possibility of cumulative impacts where impacts on the environment take place so frequently in time or so densely in space that the environment cannot assimilate the effects will be given.
  f. The magnitude of each impact will be determined as predicted deviation from the baseline conditions, during the pre-construction, construction and operation phase.
  g. The data used to estimate the magnitude will be clearly described.
  h. The methods used to predict impact magnitude will be described.
  i. The significance of impacts will be assessed using the appropriate national and international quality standards where available.
  j. Remaining impacts after mitigation will be assessed using the appropriate national and international quality standards where available. Where no such standards exist, the assumptions and value systems used to assess significance will be justified.

Task 6: Analysis of Alternatives

The identified impacts will be assessed and compared with different alternatives such as location of transmission line, type of towers and technical specifications, including the "No project alternative". If this process (alternative comparison) has already been done in the previous planning process, the study team will confirm the process undertaken to compare or consider potential alternatives. The following alternatives are to be considered for alternative analysis for the proposed Project:

- Best Available Technology (BAT)
- Options for locations of transmission line
- Options available to mitigate impact/risks; and
- No project scenario (zero option).

The comparison should address main environmental advantages and disadvantages of each alternative and give reasons for the final choice.

Task 7: Preparation of Mitigation Measures

Mitigation measures for all significant impacts should be prepared in terms of avoidance, minimization, compensations, offsetting etc. Mitigation measures and enhancement measures shall be prepared for both negative and positive impacts such as increased generation of electricity, employment, noise pollution, water pollution and increased pressure on water, changes to the flora and fauna. The consultant shall also suggest possible cost for the implementation of mitigation and describe institutional responsibilities and time frame within the project cycle for their implementation.

Task 8: Preparation of Environmental and Social Management and Monitoring Plan

The consultant shall prepare the Environmental and Social Management and Monitoring Plan (ESMP) to address management of all impacts and carry out regular monitoring of the performance of the mitigation measures. The ESMP shall consist of implementation measures for mitigation proposed in Task 7 covering pollution control measures as per allowable emission thresholds/standards, solid and hazardous waste management; occupational health and safety measures etc. The monitoring plan shall consist details regarding frequency of monitoring and sample collection, type of samples to be collected (e.g., for water, ecology, social economics, health etc). Further details regarding timeliness and organizational responsibilities in undertaking monitoring and expected financial resources required must be provided. Where inter-organizational collaboration will be needed to facilitate monitoring efforts, that arrangement and commitment must be clearly stipulated. Clear reporting mechanism as per the Environmental Impact and Audit Regulations, 2005 must be provided in the EIA report.

Task 9: Preparation of the EIA Report

(a) The main report. The consultant shall prepare EIA report and submit the required number for copies to the client and then to the National Environment Management Council (NEMC) for review and final approval by the VPO. The report must contain the following key elements:

- Executive summary;
- Acknowledgement;
- Acronyms;
- Introduction;
- Project background and description;
- Policy, administrative and Legal framework;
- Baseline Conditions;
- Stakeholder Consultations and views
- Assessment of Environmental and Socioeconomic Impacts;
- Analysis of Alternatives
- Mitigation Measures;
- Environmental and Social Management and Monitoring Plan;
- Cost benefit analysis;
- Decommissioning Plan;
- Summary and Conclusion
- References;
- Appendices;

(b) The Cover Page of the EIA Report must have the following information:

- Title of the proposed project;
- Location of proposed development;
- Developer;
- Lead consultants;
- Contact address and phone;
- Date of submission.

(c) EIA Report must also consist of Executive Summaries in Kiswahili and English that bearing information as provided in the EIA and Audit Regulations, 2005:

i. Title and location of the project or undertaking;
ii. Name of the proponent and contact;
iii. Names and addresses of experts or firms of experts conducting EIA;
iv. A brief outline and justification of the proposed project or undertaking showing:
v. A brief description of the project environment;
vi. Project stakeholders and their involvement in the EIA process;
vii. Explanation on why some impacts are not addressed;
viii. List of developer, consultant, and local planning authorities and other people

ix. and organizations consulted
x. Results of public consultation
xi. Description of the major significant impacts;
xii. Alternative considered;
xiii. Recommendations and plan for mitigation of the impacts;
xiv. Environmental and social management;
xv. Proposed monitoring and auditing;
xvi. Resource evaluation or cost benefit analysis, and
xvii. Conclusion and Recommendations

Methodology

An EIA is an open participatory process; the consultant is therefore required to ensure that appropriate methods that would ensure maximum participation of all key stakeholders are followed. Methods such as literature review, consultations with key stakeholders, interviews, meetings, and focus group discussions should be used where appropriate. Other methods such email communications, phone calls, should be used where applicable. Maps, diagrams and other visual presentation techniques are highly recommended. The consultant must visit the proposed site and consult with relevant stakeholders in order to get their concerns and views.

Deliverables

The EIA team will produce and submit the following documents according to the required numbers as per the EIA and Audit Regulations, 2005:

i. Project Registration Form and Project Brief
ii. Scoping Report with Terms of Reference
iii. Draft EIA Report
iv. Final EIA Report

Expertise to be involved

The team shall consist of the following key experts:

i. Sociologist, Policy Analyst, EIA process and Team Leader
ii. Wildlife Ecologist
iii. Plant Ecologist
iv. Social – Economics and Resettlement Expert
v. Archaeologist and Cultural Heritage Expert
vi. Water Resources Engineer
vii. Electrical Engineering
viii. Land use expert
ix. Natural Resource Management expert Additional experts will be called in when needed.

Assignment Period

The EIA process shall take within three months or 12 weeks 85 10.2 Stakeholders participated in the meetings,

13.2 Stakeholders participated in the meetings, Views, comments and responses

Stakeholders and nature of the meeting	Place	Date	Views and Concerns	Response
Introduction of the project and Discussion with Ubungo Municipal Officials responsible with environment and Town planning	Ubungo Municipal Council	31. 12.2019	• Appreciated the initiative taken by the government to increase power in the city of Dar es Salaam	
			• Municipal Officials emphasized the need to be involved the environmental, land officers and town planners in the assessment	• It was agreed that the municipal officials to be involved in the assessment
Introduction of the project and Discussion with the National Institute of Transport Officials responsible with Transport Safety and Environment as well as Planning issues	National Institute of Transport (NIT)	08.05.2020	• National Institute of Transport (NIT) accept the project on the ground that it will enhance electricity supply and reduce frequency power-cut in the City. • Currently the NIT is in transition of upgrading the institution from institute to University; there are several ongoing projects including construction of several flats for staff and students which requires reliable electricity. • NIT is engaging in different important activities, one of the activities is inspection of imported vehicles and installations; the Institute is planning to upgrade the facility. TANESCO should demarcate the project area to avoid interference with NIT daily activities. In addition the client should not block access to NIT • TANESCO should ensure electromagnetic effect from electricity does not cause effect to student and staff during operation of the project • Provide awareness to workers on health and safety issue especially during construction phase • The client should communicate with the NIT Planning department in order to ensure activities of the project does not affect activities of the institute especially during examination • Boundary between NIT and TANESCO way-	• TANESCO has already written a letter to NIT and initiated discussion with other institutions responsible for land such as Ministry of Land and Ubungo Municipal Council in order to find ways of solving the boundary dispute between the two institutions

			leave should be resolved before implementation of the proposed project	
Introduction of the project and Discussion with DAWASA officials	Dar es Salaam Water Supply and Sanitation Authority (DAWASA)	20.10.2021	• The proposed project is good and timely required because it will help to reduce the problem of power in the City due increased demands which include energy water pumping machines. • The project proponent is required to make follow up with DAWASA regional office where the project is located, particularly during the construction of the project. • The proponent should ensure adequate, transparent and participatory public consultations in all stages of project development	
Introduction of the project and Discussion with TPDC - GASCO officials	Tanzania Petroleum Development Corporation	11.11.2021	• The proposed project id good • Currently, GASCO has no any development plan along the project area, may be in the future • Joint site survey between two parts (TANESCO & GASCO) before project implementation • Submission of notification letter, plan and methodologies of the activity for permit from GASCO. • Implementation of any site activity along or across TPDC Gas Pipeline should be witnessed by GASCO personnel. All supervision cost shall be borne by project contractor. • Proper communication of GASCO's permit condition to project main and sub-contractor should be observed and adhered. •	
Sensitization and awareness meeting	Mavurunza - in Kimara ward	10.01.2020	• Stakeholders were concerned about the decision of TANESCO to extend the way leaves in order to accommodate the new Transmission line. They complained to see TANESCO staff to put mark beyond the existing way leaves indicating the need for land acquisition. However, the consultant	Consultation and field visits with TANESCO officials in collaboration with mtaa leaders and community confirmed

			clarified the issue that TANESCO does not need new land for the project. It intends to use the existing way leave for the new transmission line. • Stakeholders wanted to know when the project will start • Advised on the use of underground cable to minimize land take • TANESCO should maintain and manage the access road to the transmission line for easy access during maintenances and any accident that may happen to the transmission line	that the structures were illegally located within the TANESCO wayleave. Therefore, the people have already demolished the structures within the existing wayleave of the transmission line.
Sensitization and awareness meeting in	Kimara Baruti in Kimara ward	11.01.2020	• Upgrading the power transmission line from 132 kVA to 220kVA will result into increased generation of electromagnetic field and thus increase the effect to the local communities living adjacent/close to the transmission line. What measures would TANESCO put in place to restrain this effect • TANESCO has extended their way leave by 15 metres into community's land and properties; a demarcated and erected beacon without consultation with owners as well as before valuation and compensation is done. • People are well informed about the procedure for land acquisition according to the land laws • TANESCO should come to the people through Kimara Baruti Ward Office and explain what they have done (i.e. extending the way leave) before continuing with their project development plan. • Most of the land in Kimara Baruti Ward and surrounding areas was not surveyed, currently the ward in doing squatter upgrading/ formalization activities. Urban Plan is excluding the area where TANESCO has erected beacons even if that area does not belong to TANESCO. • Local communities are of the opinion that TANESCO should remove the beacon they erected so	The existing wayleave was acquired by considering all negative impact from electromagnetic field. Therefore, no impact is expected from transmission line. • The beacons were erected by the officials from land department based on the official boundary of TANESCO. • The beacons were not erected were not erected by TANESCO, but land officers who knowns the boundary of TANESCO. Therefore, there is no way TANESCO can remove the beacons by

			that their (community) land is included in the upgrading/formalization process and get title deeds. • Also local communities are complaining that they raised their concerns with the Ubungo Municipal Director but they have not received any answers. They need urgent and clear responses on this matter.	the responsible authority.
Sensitization and awareness meeting	Kilungule A in Kimara ward	11.01.2020	• There is a need for TANESCO in collaboration with the Ministry Land, Human Settlement and Urban Development and Ubungo Municipal Council (Town planning department) to revisit the existing boundary of the Transmission Line • TANESCO should use a more reliable instrument to determine the boundaries - something like a GPS instead of a tape measure.	GPS were used in initial measurement, however, in the assessment of the wayleave, tape measures were used, this had no impact in the original measurement of the wayleave
Sensitization and awareness meeting	Kilungule B in Kimara ward	11.01.2020		
Sensitization and awareness meeting Ward	Kibangu in Makuburi ward	11.01.2020	• People have accepted the project but also caution about employment opportunities during construction and protection of their environment and their health have to be taken into account.	•
Sensitization and awareness meeting	Kibo in Ubungo ward	29.01.2020	• Stakeholders have reported that the valuation of properties in the area was done since 2013 but no compensation has been paid so far. Affected persons to know when they will be compensated in order to enable them to find new area settlement.	• TANESCO management is aware of valuation which was undertaken in 2013. However, they have not received funds from the government for the

				payment of compensation.
			• They complained that they have been living in a difficult environment since the valuation has taken place because they are not allowed to do any improvement in their houses because any modification after the valuation will not be considered for compensation. • Since the valuation of properties has been done, stakeholders did not want to engage with consultant because all that they need is their payment from the 2013 valuation	•
Sensitization and awareness meeting	Kisiwani in Ubungo ward	29.01.2020	• The stakeholders admitted that they are utilizing the TANESCO Way leave for various activities. • They wanted to know when the project will start so that they can vacate the site • They requested to be informed in advance about the commencement of the project so that they can prepare themselves to move.	•

Consultation with Gas Company (Tanzania) Limited

UNITED REPUBLIC OF TANZANIA

MINISTRY OF ENERGY

GAS COMPANY (TANZANIA) LIMITED

GASCO

A subsidiary company of TPDC

On replying indicate:

Ref No: AB.170/370/01/30 Date: 23/11/2021

Managing Director,

Tanzania Electric Supply Company Limited,

P.O Box 453,

Dodoma.

RE: ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED KINYEREZI - MABIBO 220kV TRANSMISSION LINE

Refer to the heading mentioned above.

2.We aknowledge the recepient of your letter dated 7th November 2021 with reference number DMDI/SMR/MEnv/EIA/19 introducing East Africa Resource Group (EARG) as your consultant for carring out EIA for the above mentioned project.

3.The named consultant shared with us the project summary and questionnaire as a part of the consultation work. GASCO as an operator of TPDC natural gas infrastructure evaluated the project and come up with the recommendations to be adhered before commencement of the project. Our recommendations are well elaborated in clause 5 of the attached questionnaire.

4.GASCO insist on proper communication, supervision and adherence to these procedures before and during project implementation to avoid unnecessary down time as the results of any effects to the gas pipeline.

5.Looking forward for your cooperation.

Yours faithfully,

Digitally signed by Baltazari Thomas Mrosso
Date: 2021.11.23 14:22:55 +03'00'

Eng. Baltazari Thomas

ACTING GENERAL MANAGER

Plot no,1 Block D, Kibaga street,Kinyerezi Gas Receiving Station,P,O,Box 714, Dar es salaam, Telephone: +0222928565, Fax: +255222200113, Email: gmgasco@tpdc,co,tz, Website: www,tpdc,co,tz

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF 9KM OF 220kV TRANSMISSION LINE FROM KINYEREZI T – OFF POINT TO THE NEW MABIBO SUBSTATION, DAR ES SALAAM

Checklist of Questions for other Institutions with Infrastructures along the Proposed Project Area

DATE: 11/11/2021

Name of Respondent: **DEUSDEDIT M. KIHEKA**

A: BACKGROUND INFORMATION

Name of Institution: **GASCO - TPDC**

Name of Department: **GAS PIPELINE & DISTRIBUTION**

Position of Respondent: **HEALTH SAFETY AND ENVIRONMENT OFFICER**

Signature: .....

1. What can you say about the project? **GOOD/BAD**
2. Please explain your answer

   .....

   .....

3. Is there any new proposed development along the project area? **(No, currently may be later)**
4. If yes, please explain

   .....

   .....

5. What are the procedures need to be followed by the client (TANESCO) before starting construction?

i. **Joint site survey between two parts (TANESCO & GASCO) before project implementation**

ii. **Submission of notification letter, plan and methodologies of the activity for permit from GASCO.**

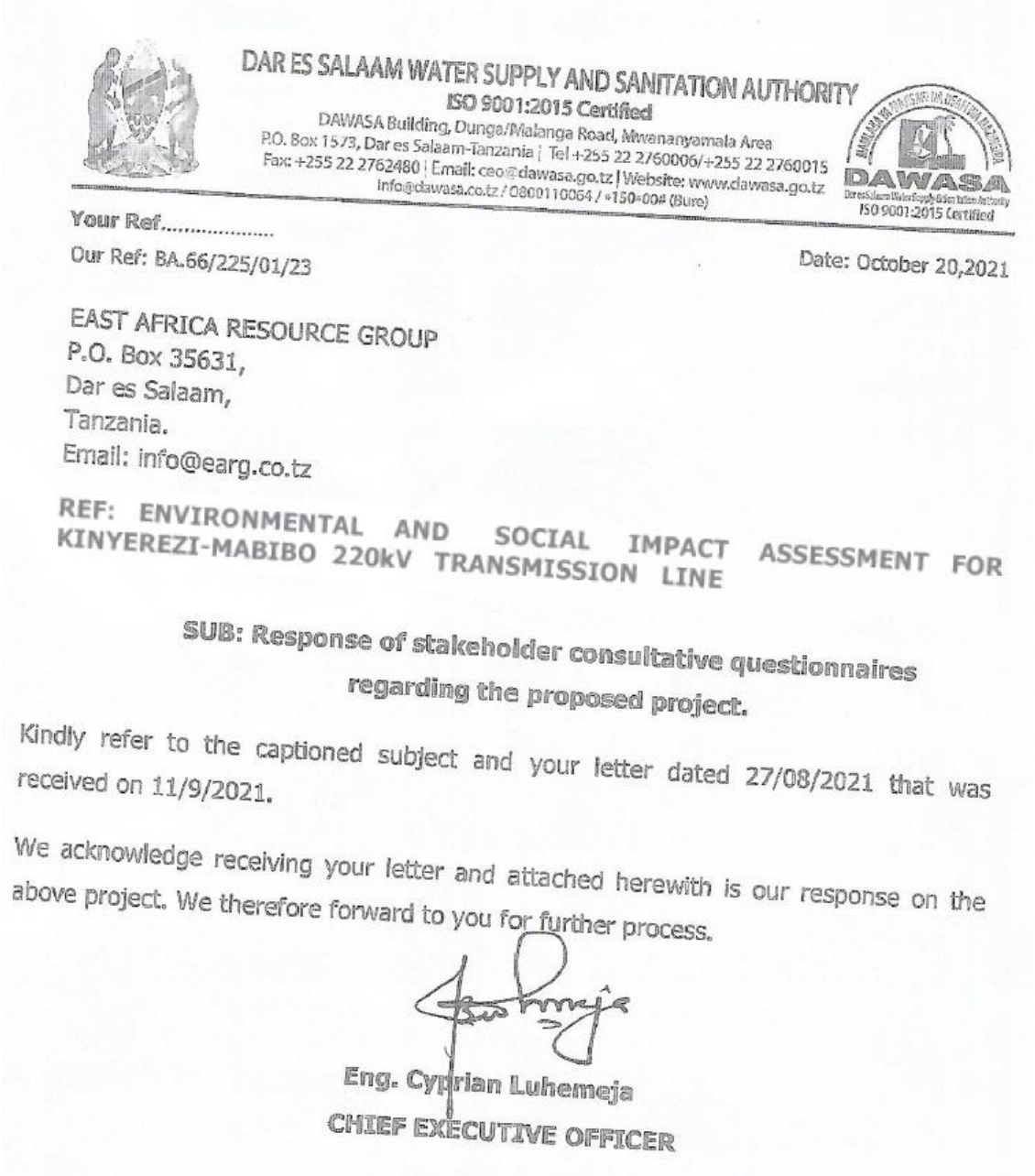
iii. **Implementation of any site activity along or across TPDC Gas Pipeline should be witnessed by GASCO personnel. All supervision cost shall be borne by project contractor.**

iv. **Proper communication of GASCO's permit condition to project main and sub-contractor should be observed and adhered.**

6. If there is a clear list of procedures, please attach. ***(To be include in GASCO Permit condition before commencement of the project)***

THANK YOU.

Consultation with DAWASA



DAR ES SALAAM WATER SUPPLY AND SANITATION AUTHORITY
ISO 9001:2015 Certified
DAWASA Building, Dunga/Malanga Road, Mwananyamala Area
P.O. Box 1573, Dar es Salaam-Tanzania | Tel +255 22 2760006/+255 22 2760015
Fax: +255 22 2762480 | Email: ceo@dawasa.go.tz | Website: www.dawasa.go.tz
info@dawasa.co.tz / 0800110064 / *150*00# (Bure)
DAWASA
ISO 9001:2015 Certified

Your Ref.....
Our Ref: BA.66/225/01/23

Date: October 20,2021

EAST AFRICA RESOURCE GROUP
P.O. Box 35631,
Dar es Salaam,
Tanzania.
Email: info@earg.co.tz

REF: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR KINYEREZI-MABIBO 220kV TRANSMISSION LINE

SUB: Response of stakeholder consultative questionnaires regarding the proposed project.

Kindly refer to the captioned subject and your letter dated 27/08/2021 that was received on 11/9/2021.

We acknowledge receiving your letter and attached herewith is our response on the above project. We therefore forward to you for further process.

Eng. Cyprian Luhemeja
CHIEF EXECUTIVE OFFICER

STAKEHOLDERS CONSULTATIVE QUESTIONNAIRE

PROJECT: ENVIRONMENT IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF 9KM OF TRANSMISSION LINE FROM KINYEREZI T-OFF POINT TO THE NEW MABIBO SUBSTATION, DAR ES SALAAM.

Name of institution.....

Name of Department.....

Position of respondent.....

Signature:.....

1. What can you say about the project? Good/Bad

Ans: Good

Please explain your answer: Because it will save the community who live near the project to be constructed.

2. Is there any new proposed development along the project area? Yes/No

Ans: Kindly follow up with Dawasa regional office near by the proposed construction project.

3. What are the procedures need to be followed by the client (TANESCO) before starting construction?

Ans:

The following are the procedures need to be followed before starting construction:

Stakeholder consultation.

- Ensuring adequate, transparent and participatory public consultation are done in order to obtain opinions from concerned stakeholders.
- Find out what issues stakeholders are concerned about.

Apply for a permit

The client should supposed to request the construction permit to the authority found near by the proposed project.

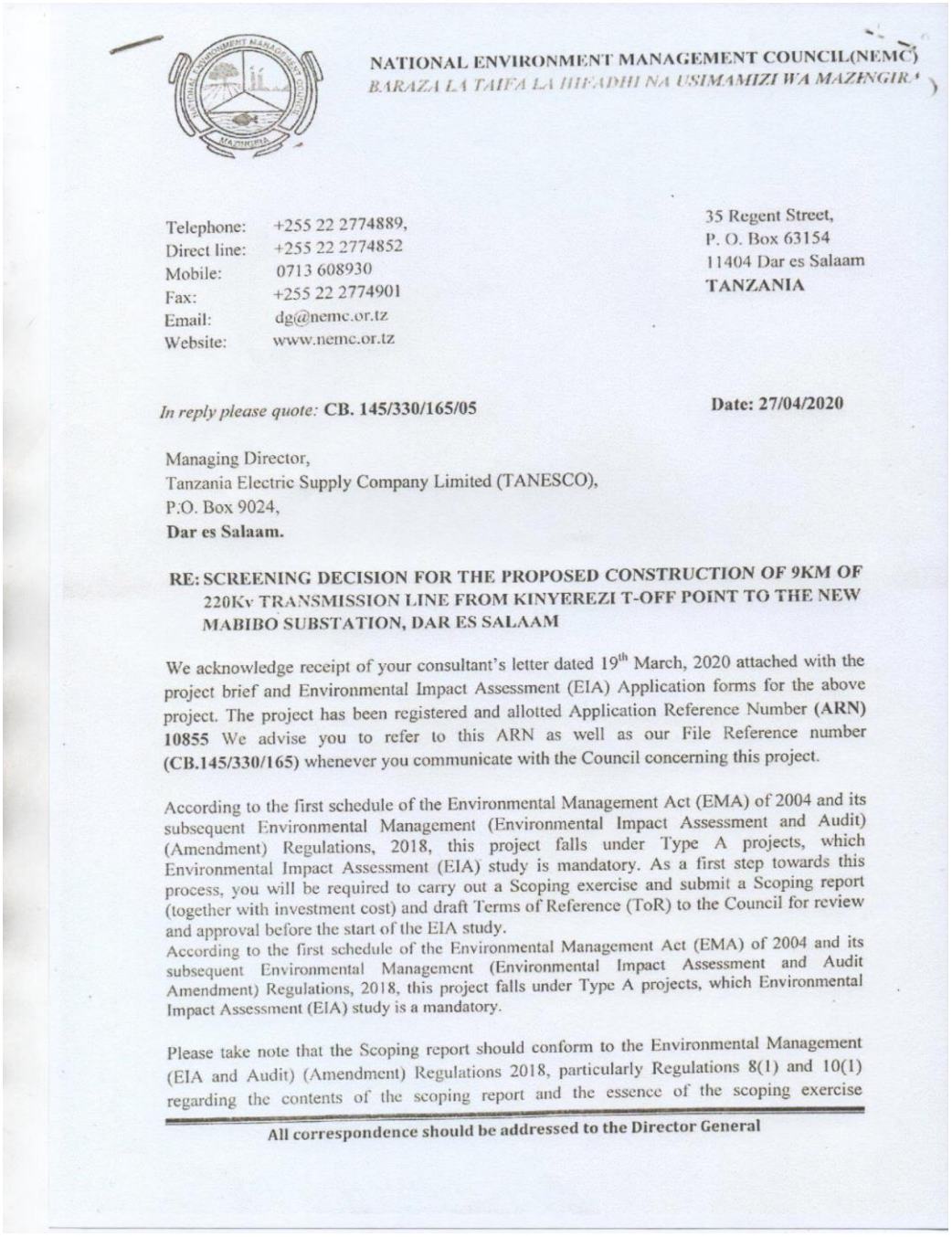
Risk assessment

The client should conduct risk assessment before undertaking the project for the purpose of determine the risk associated with the project and control measure.

Buffer zone

The client is supposed to keep safety buffer zone before conducting a proposed construction project

13.3 NEMC Screening Decision



NATIONAL ENVIRONMENT MANAGEMENT COUNCIL(NEMC)
BARAZA LA TAIFA LA HIFADHI NA USIMAMIZI WA MAZINGIRA

Telephone: +255 22 2774889,
Direct line: +255 22 2774852
Mobile: 0713 608930
Fax: +255 22 2774901
Email: dg@nemc.or.tz
Website: www.nemc.or.tz

35 Regent Street,
P. O. Box 63154
11404 Dar es Salaam
TANZANIA

In reply please quote: **CB. 145/330/165/05**

Date: 27/04/2020

Managing Director,
Tanzania Electric Supply Company Limited (TANESCO),
P.O. Box 9024,
Dar es Salaam.

RE: SCREENING DECISION FOR THE PROPOSED CONSTRUCTION OF 9KM OF 220Kv TRANSMISSION LINE FROM KINYEREZI T-OFF POINT TO THE NEW MABIBO SUBSTATION, DAR ES SALAAM

We acknowledge receipt of your consultant's letter dated 19th March, 2020 attached with the project brief and Environmental Impact Assessment (EIA) Application forms for the above project. The project has been registered and allotted Application Reference Number **(ARN) 10855** We advise you to refer to this ARN as well as our File Reference number **(CB.145/330/165)** whenever you communicate with the Council concerning this project.

According to the first schedule of the Environmental Management Act (EMA) of 2004 and its subsequent Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018, this project falls under Type A projects, which Environmental Impact Assessment (EIA) study is mandatory. As a first step towards this process, you will be required to carry out a Scoping exercise and submit a Scoping report (together with investment cost) and draft Terms of Reference (ToR) to the Council for review and approval before the start of the EIA study.
According to the first schedule of the Environmental Management Act (EMA) of 2004 and its subsequent Environmental Management (Environmental Impact Assessment and Audit Amendment) Regulations, 2018, this project falls under Type A projects, which Environmental Impact Assessment (EIA) study is a mandatory.

Please take note that the Scoping report should conform to the Environmental Management (EIA and Audit) (Amendment) Regulations 2018, particularly Regulations 8(1) and 10(1) regarding the contents of the scoping report and the essence of the scoping exercise

All correspondence should be addressed to the Director General

espectively. Also, be reminded to observe directives given under Regulation 10(2) of the Amended Regulations.

For further information or clarification on this matter, please do not hesitate to contact us through Tel. No. +255 767 774 777, Monday – Friday around 8:00am to 4:00pm.

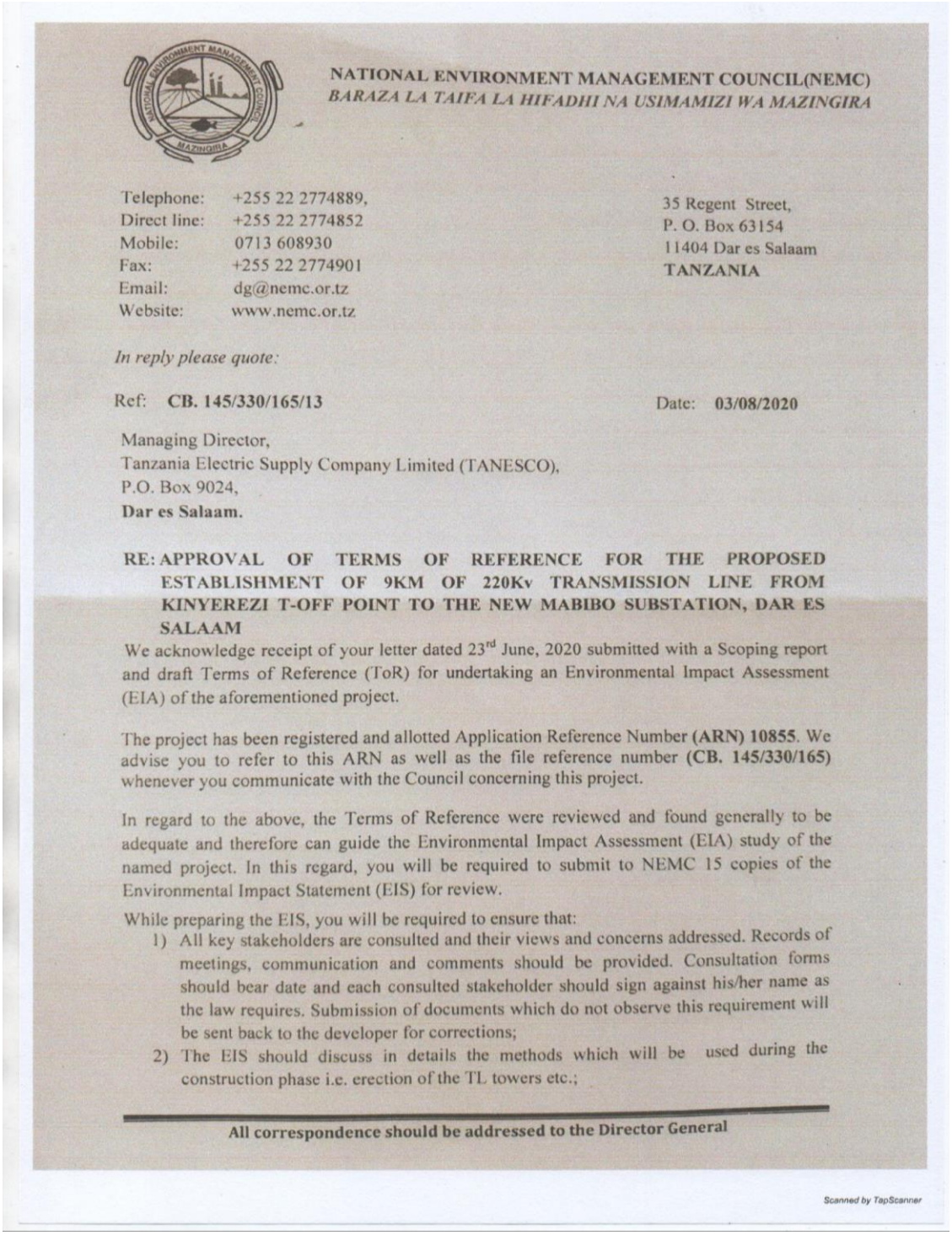
Yours Sincerely,

Glory J. Kombe
For: Director General

Cc: EAST AFRICA RESOURCE GROUP,
P.O. Box 35631,
Dar es Salaam.

All correspondence should be addressed to the Director General

13.4 NEMC Approval of Terms of Reference



NATIONAL ENVIRONMENT MANAGEMENT COUNCIL(NEMC)
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Email: dg@nemc.or.tz
Website: www.nemc.or.tz

35 Regent Street,
P. O. Box 63154
11404 Dar es Salaam
TANZANIA

In reply please quote:

Ref: **CB. 145/330/165/13** Date: **03/08/2020**

Managing Director,
Tanzania Electric Supply Company Limited (TANESCO),
P.O. Box 9024,
Dar es Salaam.

RE: APPROVAL OF TERMS OF REFERENCE FOR THE PROPOSED ESTABLISHMENT OF 9KM OF 220Kv TRANSMISSION LINE FROM KINYEREZI T-OFF POINT TO THE NEW MABIBO SUBSTATION, DAR ES SALAAM

We acknowledge receipt of your letter dated 23rd June, 2020 submitted with a Scoping report and draft Terms of Reference (ToR) for undertaking an Environmental Impact Assessment (EIA) of the aforementioned project.

The project has been registered and allotted Application Reference Number **(ARN) 10855**. We advise you to refer to this ARN as well as the file reference number **(CB. 145/330/165)** whenever you communicate with the Council concerning this project.

In regard to the above, the Terms of Reference were reviewed and found generally to be adequate and therefore can guide the Environmental Impact Assessment (EIA) study of the named project. In this regard, you will be required to submit to NEMC 15 copies of the Environmental Impact Statement (EIS) for review.

While preparing the EIS, you will be required to ensure that:

1) All key stakeholders are consulted and their views and concerns addressed. Records of meetings, communication and comments should be provided. Consultation forms should bear date and each consulted stakeholder should sign against his/her name as the law requires. Submission of documents which do not observe this requirement will be sent back to the developer for corrections;
2) The EIS should discuss in details the methods which will be used during the construction phase i.e. erection of the TL towers etc.;

All correspondence should be addressed to the Director General

3) The project should be well described indicating all project phases, all components and the activities in each phase;
4) Use specific and most current, qualitative and quantitate baseline data on the physical, biological, socio-economic and cultural environment. Also provide data of various parameters including air, noise levels, surface and groundwater qualities including the existing underground infrastructures like gas and water pipe lines along the corridor;
5) Preliminary engineering designs of the transmission line and its supporting facilities must be discussed and append in the EIS;
6) The report should bear the design period of the project, cumulative water demand, characteristic of waste water and solid wastes to be produced during each project phase;
7) The EIS should described well if there will be any Project Affected Persons (PAPs) at the area through which the transmission line will pass;
    - Explain about displacement of people and property valuation, relocation and compensation arrangements if any;
8) Time frame for which this study will be conducted should be indicated in the ToR stating clearly the time from project brief up to final submissions;
9) The study should involve experts with background of Civil, Environmental, Electrical, Municipal and Industrial Service Engineering; Sociology, Ecology, Wildlife and Public Health;
10) All experts involved in the study should sign the EIS with their original signatures (not scanned signatures or forged signatures) and be indicated whether he/she is a registered or non-registered environmental expert, Failure to observe this requirement, it will constitute to an offense as per EMA, 2004 Cap 191;

Kindly submit immediately two copies of the approved ToR as separate documents for endorsement prior to the EIA study.

Invoice No. 05651 for the review cost is attached with this letter amounting to TZS. **30,000,000/=** for your action and it excludes transport costs to and from the site. Please, do not hesitate to contact us in case you need additional information or clarification on this process through Telephone No. 0767 774 777 from Monday-Friday around 8:00am to 04:00pm. Once you are ready to pay please contact us through cellphone No. 0677 069 967 so that you can be issued a control number to effect your payments.

You will be required to submit 15 copies of the EIA report. Upon submission of the EIA, the Council will arrange for site verification visit for the proposed site as part of the review process.

Yours Sincerely,

Eng. Benjamin J. Mchwampaka
For: Director General.

CC: EAST AFRICA RESOURCE GROUP,
P.O. Box 35631,
Dar es Salaam.

All correspondence should be addressed to the Director General

13.5 Signatures forms for the Consulted Stakeholders

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TARI
1	JESCA STANLEY	MANISPAA YA UBUNGO	AFISA MAENDELEO	0676-935485 0622-731715		03/01/20
2	ESINA E. LUSUVA	—11—	AFISA AFYA	0713528309		—11—
3	METHOD DAMIAN	WEO-KIMARA	KATA KIMARA	0736624331		7.01.2
4	RENFORD P. KIZO	MEO-MAKURUMZA	MTENDAJI	0713584470 0758700088		7.01.2
5	ISSA A. MBURA	MEO-KILUNGULE "B"	MTENDAJI	0659941410		7.01.2
6	JOSHUA W. GUNDA	MEO-KILUNGULE A	MTENDAJI	0713164436		7.01.2
7	GINAU SHEMA	FIELD - KILUNGULE A	MTENDAJI	0653250527		7.01.2
8	SIA MOSHI	FIELD - KILUNGULE A	MTENDAJI	0763054765		07.01.2
9	GODWIN F. MANGOWI	MEO - K/BARUTI	MEO	0658282680		07/01/
10	HELLEN A. MANSAWE	FIELD - K/BARUTI	MTENDAJI	0767770460		07/01/
11	MERY H. CHIBIRITI	FILD - K/BARUTI	MTENDAJI	0754032969		07/01/
12	ASHA H. KILILA	FILD - K/BARUTI	MTENDAJI	0676346099		7/1/2

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TA
1	ELIZABETH MWALUMBANDU LUKAS	K/MARA BARUTI	MWANACHI	07199920		11/011
2	PILI MWIMYA JUMA	K/BARUTI	MWANANCHI	07130164 78		11/011
3	MOHAMED. S. MCHAU	K/BARUTI	MWANANCHI	0717-667961		11-01
4	RICK. J. MOSI	K/Baruti	M/S/Maa	0754-780442		11/01/2
5	GODWIN F. MANGOWI	K/BARUTI	MEO	0658283680		11/1/20
6	MOHAMED S. KILONGO	K/BARUTI	M/KITI	0713212792		11/1/20
7						
8						
9						

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/T
1	ELEAINA MICHAEL NTANDU	KIMARA BARUTI	MWANANCHI	0784-609847	[signature]	11/01/
2	GABRIEL M. MWAKILEWAMBA	" "	MWANNCHI	0765277618	[signature]	11/01
3	STEPHEN N. ALYIMO	— " — "	MWANANCHI	0715138137	[signature]	11/01/2
4	DAVID GERALD KIRENGA	— " —	"	0652068856	[signature]	11/01/
5	MAGDALENA TARIMO	— " —	MWANANCHI	0713898565	Tarimo	11/01
6	HABIBA SAIDI IBRAHIM	— " —	"	0712463044	HSaid	11/01
7	PRUDENCIA PATRICK KOPPA	— // —	— // —	0764798492	[signature]	11/01/
8	GRACE MATOKA	— " —	— " —	0714 981669	[signature]	11/0
9	ASHA IBRAHIM	— " —	— " —	ANA		11/
10	UBUBU HUBERT BAHAT	— // —	MWANANCHI	075439689	[signature]	11/01
11	RASHIB AMIR	— // —	— //	0715060169	[signature]	11/01/
12	FREDY SUSULU	" "	MWANANCHI	0715444715	[signature]	11/01/

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TAR
1	Kaigi Kyejo	Kilungule A.	M/KITI	0713-444155	[signature]	11/01/2
2	ZAINABU H. NAMWANGO	KILUNGULE "A"	—	0715-669552	[signature]	11/01/20
3	BAHATI H. MUSHI	KILUNGULE 'B'	—	0713296784	Bush	11/01/
4	GISSELA N. NCHIMBI	KILUNGULE B		0755-234396	[signature]	11/01/2
5	MARTIN MESHACK	KILUNGULE B	—	0714-315470	[signature]	11/01/2
6	SALIM JUMA	KILUNGULE B	—	0715374419	[signature]	11/01/2
7	MICHAEL MAGESA	KILUNGULE B	—	0768037467	Mmagesa	11/01/20
8	Ebeneza A. Shayo.	Kilungule B	—	0747150311	E.A. Shayo.	11/01/20
9	CHRISTOPHER TAIRO	KILUNGULE A	—	0713284751	[signature]	11/01/
10	ALEX EMANUEL TARIMO	KILUNGULE B	—	0713873220	[signature]	11/01/20
11	ERICK MTANI	KILUNGULE B	—	0658-723777	[signature]	11/1/20
12	SALUM A. JABA	KILUNGULE A	—	0658667689	[signature]	11/1/20

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

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S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TAR
1	Kaigi Kyejo	Kilungule A.	M/KITI	0713-449153	[signature]	11/01/2
2	ZAINABU H. NAMWANGO	KILUNGULE "A"	—	0715-669552	[signature]	11/01/20
3	BAHATI A. KILISHI	KILUNGULE 'B'	—	0713296784	Bush;	11/01/
4	GISSELA N. NCHIMBI	KILUNGULE B		0755 234396	[signature]	11/01/2
5	MARTIN MESHACK	KILUNGULE B	—	0714-515470	[signature]	11/01/2
6	SALIM JUMA	KILUNGULE B	—	0715374719	[signature]	11/01/2
7	MICHAEL MAGESA	KILUNGULE B	—	0768037467	Mmagesa	11/01/20
8	Ebeneza A. Shayo.	Kilungule B	—	0747150511	E.A. Shayo.	11/01/20
9	CHRISTOPHER TAIRO	KILUNGULE A	—	0713284751	[signature]	11/01/
10	ALEX EMANUEL TARIMO	KILUNGULE B	—	0713873220	[signature]	11/01/20
11	ERICK MTANI	KILUNGULE B	—	0658-723777	[signature]	11/1/20
12	SALUM A. JABA	KILUNGULE A	—	0658667689	[signature]	11/1/20

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

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S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TAR
1	Zaina A. Mwemzunda			0693022150	[signature]	
2	MATHIA J. MKUMBA			0652479162	[signature]	
3	HAFSI MURSALY			0713-983174	H. Mursaly	
4	HAMZA KASSIM			0673-070786	[signature]	
5	UPENDO MURO			0712618154	[signature]	
6	HABIB ALLY			0655746416	H. Ally	
7	MARIA SIDE			0	[signature]	
8	ASHA PEMBE					
9	CONSOLATA MWACHA			0714925404	[signature]	
10						
11						
12						

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TAR
1	HEMED ALLY HEMED	KILUNGULE A	MWANANCHI	0716688106	[signature]	11-1-2
2	ERNEST N. KIMOLA	KILUNGULE 'A'	—	0754085600	[signature]	11-1-
3	HEMED YUSUPH	KILUNGULE A	—	0712843832	[signature]	11-1-
4	Hussein Hassan	KILUNGULE (A)	—	0659-411496	[signature]	11-1-
5	NASSORO SHOMARI NASSORO	KILUNGULE (A)	—	0717968252	[signature]	11/1/2
6	RHOIDA JAPHET LWEHEZA	-do- 'A'	—	0752-287103	[signature]	11/01/2
7	FRANK Jumanne Mpemba	KILUNGULE A	—	0679351464	[signature]	11/01/
8	SIMON RASHIDI KILONGOZI	KILUNGULE B	—	0658178765	[signature]	11/01/
9	SARAH EDSON MWAMBENE	KILUNGULE A.	—	0655658584	[signature]	11.01.
10	Rajabu Lukinza	Kilungule A	—	0716933383	[signature]	11/01/
11	MARTHA A. MBILINYI	KILUNGULE B	—	0763581121	[signature]	11/01/
12	SUWEMA RASHIDI	KILUNGULE B	—	0714696169	Rashidi	11/01

SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TA
ERASTO N. SHIRIMA	TANESCO		0784-974903	[signature]	11/01/
ANNA . N . SAULE	SIDO	MWANANCHI	0655-07[illegible]	A. Saule	11
DATIV NJAU		11	0755-946429		11
PIL MOHAMED		MWANANCHI	0714-596604	P. M. Abdal	11
CHARLES MHANDO			0653014383	[signature]	
THOMAS KAHEMA	.Dx.	11	0752660610	[signature]	
Kulwa Juma		MWANANCHI	0719518830	[signature]	
ZUWENA RASHIDI			0694225294		
SAIDI AMISI			0657143232		
HAMIDU NASSIBU		MWANANCHI	0657799393		11/01/2
ZENA A BANDA		MWANANCHI	0718-204888	[signature]	11/01/
Eva paulo		Mwananchi	0694-005399	E. Paulo	11/1/

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TAR
1	MIZI GASPAR PETER	KILUNGULE "A"	MWANANCHI	0755 395196		11/01/2
2	SELEMAN MCHAMU	KILUNGULE "A"	MWANANCHI	0786-019797		11/01/20
3	CHARLES W. MPANDUJI	KILUNGULE "B"	MWANANCHI	0714 216916		11/01/2
4	JOHN F. MPONGULIANA	KILUNGULE "B"	MWANANCHI	784 220023		11/01/202
5	MILHA A HASSANI	KILUNGULE B	MWANANCHI	0655 083768		11/01/2
6	ISSA MBURA	KILUNGULE B	MTENDAJI	0655 444440		11/01/2
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ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/T
1	TAJI KANUGI	UMC	MWENYEKITI	0652 278038		11/01/
2	PENFORD P. KIZO	UMC	MTENDAJI	0713684430		11/01
3	PETER B. BAIROME	MAVURUNZA		0 6899140144		11/01
4	EDWARD E. LUYAKWIPA	MAVURUNZA		0715739878		11 JAN
5	MICHAEL HENRY MAGESA	—11—		0755203567		11 JAN
6	MOHAMED I. ISMAIL	—11—		0769713103		11 Ja
7	FRANCIS JACOBO	—11—		0657829028		11/01
8	ENARIST FELIX KIMARIO	MAVURUNZA		0715-365139		11/01
9	Awadhi Bakari	MAVURUNZA		07 19 100560		11/01
10	YONA JORO LEMEI	MAVURUNZA	MWANANCHI	0712 164195		11/01
11	AMES MAKUNDA	MAVURUNZA	11	0712 206970		11/1
12	JEMIMA MAHASIRE	MAVURUNZA	11		J E Mahasire	11/11
13	STAMILI ISMAIL		11			11/1

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TA
1	JOHN J NDOMBA	MAVURUNZA	MKAZI	0715-300801	[signature]	11/01
2	JENSEN C. SHUMA	MAVURUNZA	MWANANCHI	0713-420387	[signature]	11/01
3	DR. NURDIN MOHAMED		MWANCHI	0653-012081	[signature]	11/01
4	ROSE P. KAZONDA	MAVURUNZA	MWANANCHI	0718 999996	[signature]	11/01
5	SHABAN HAMAD	MAVURUNZA	MWANANCHI	0713526653	[signature]	11/01
6	FRADCH MHINA	—	ASKARI	0755-83 [illegible]	[signature]	11/ [illegible]
7	NDIVA A - SALSTS	—	LAPA	0753850	[signature]	11 [illegible]
8	LILA JUMBE MOHAMED	MAVURUNZA	MWANCHI	0715-150068	[signature]	11/01
9	ROSE SANGA	" —	MKAZI	0767066736	Sanga	11/20
10	PATRICIA ROMANI MALLYA	MAVURUNZA	MKAZI	0752818197	Mallya	11/01
11	SALIMA : MANJANGA	MAVURUNZA		0675-383954	[signature]	11/01
12	Fatuma Juma	MAVURUNZA	Mwananchi	0717388171	[signature]	11/01

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TA
1	CLEMENT S. NYAKUNGA	MAVURUNZA		0784208065	[signature]	11/1/2
2	DENNIS B. ZANI	MAVURUNZA		0754-460620	[signature]	11/1
3	ZEPHANIA MAGANGA	MAVURUNZA		0714-518552	[signature]	11-01
4	ELIMIHAKI RAMADHANI	MAVURUNZA		0655 227626	[signature]	11-01
5	Athuman omari	MAVURUNZA		0655221124	[signature]	11-1-
6	Simbo Konenda	MAVURUNZA		0767654747	[signature]	11-1-2
7	Victoria M. Paulo	MAVURUNZA	Mwananchi	0757230086	[signature]	— 11
8	FREDRICK R. MONGI	MAVURUNZA	11	0715820124	[signature]	11/1
9	VERONICA S. KAWAYA	MAVURUNZA		0754976544	[signature]	11/1
10	MWAJUMA HAMIS	—11—	11	0713-394897	[signature]	11/1
11	JULIANA MARAMBU	—11—	MWANANCHI	0655 833059	[signature]	11/11
12	MORIS S. [illegible]	—11—	"	0754206725	[signature]	11/1

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TA
1	BERTHA BATAZAR	MANZERUNZA		0657-069808	BB	11-01-
2	CHRISTINA BATAZAR	MANZERUNZA		0674-865189	TN	11-01-
3	ALBERT MAPUNDA	MANZERUNZA.		0782-351228	TN	11-01-
4	JAILAN SEIF MKASI	MANZERUNZA		0715-568018	[illegible]	11-01-
5	ZAINABU HAMISI	"		0785669552	[illegible]	11-01-
6	HEMED ALLY HEMED	"		0716698106	[illegible]	11-01-
7	YUSUFU ABED	"		0655-515121	[illegible]	11-01-
8	Hamis Chussi	"		078 766846	[illegible]	11/01-
9	HADAMU ABDALAH	"				
10	Kwega MTOTO	"				
11	BUBIANA L. MAEMA	"		0759294690	[illegible]	
12	ZAINA ALLY	"		0656-585809	[illegible]	

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TA
1	MOHAMED A. MUARIKO	MANZERUNZA		0754449461	[illegible]	11.0
2	MWANAHIJI A. MANZAVA	MANZERUNZA		0714 034377	[illegible]	11-1
3	MATAYO M. NAMBOTE	MANZERUNDA		0718.583346	[illegible]	11-1
4	HAMZA A. ABDALAMANI	"		0658 287083	Hamza	11-1-
5	EDDA H. NIDALI	"		0787 085507	[illegible]	11-1-
6	RAMADHANI HATIBU	"		0715591008	RAMADHANI	11-1-
7	RAMADHANI SALUM POLEA	"		0715747675	[illegible]	11-1-
8	SHARIFA M NDOMONDO	"		0652-811696	[illegible]	
9	MOHAMEDI SALEHE	"		0714-336390	MS	
10	HABIBA SALUMU			0713-445857	H. Saleh.	11-12
11	MWATIBA SHAABANI			0786307558	[illegible]	11-1-
12	AMINA SHAABANI			0659414832	[illegible]	

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TAR
1	MOGELA SAIDI MOHAMED	MANZIRUNZA	MWANANCHI	0717723115		11/1/202
2	SAID MASSAH	MANZIRUNZA	MWANANCHI	0655454043		11-1-20
3	ATHUMAN HAMIS	MANZIRUNZA	MWANANCHI	0714284513		
4	UBWA RAMADHAN	——	MWANANCHI	0713 593922	Ub	11-1-2(
5	MIRAJI MAFIMBA	—11—	MWANANCHI	0715608396	Mhaw	11-12(
6	FATUMA HASSANI		Mwananch	0717488594	Fm	11/1/20
7	LUS MUPEYA		Mwananch	0679628418		11/1/20
8	ZEADA OUTRY		11	0713559290	21 O	11/01/20
9						
10						
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ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

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S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TA
1	NICODEM FRANCIS	Ubungo-kiswani	MWANANCHI	0658-228182		10/01/
2	HERY O MASUKILA	Ubungo-kiswani	MWANANCHI	0754-521615		10/01/
3	JOHN KAMISHI	Ubungo-Kiswani	MWANANCHI	0712041455		10/01/
4	MAHMOUDU SHABANI	Ubungo-Kiswani	MWANAINCHI	0652-105323		10/01/
5	HALIDI A. GORE	Ubungo-kiswani	MWANANCHI	0656-303937		10/01
6	RESPICK M. NSOKA	—1—	MWANANCHI	0754693771		10/1
7	GODLISTEN MSELLE	Ubungo kiswani	MWANANCHI	0715479147		10 /1
8	EMMANUEL PAULO	Ubungo-kiswani	MWANANCHI	0652977630		10/1/
9	AHMADI MUSSA	Kiswani	MWANANCHI	0655590908		10/1
10	EMANUEL LAMECK	Kiswani	—11—	0652325874		10/1
11	Mosh Selemani	Kiswani	—11—	0712-173912	Mosh	10/1
12	Sawbi Abdallah	Kiswani	—	0712861981		10/1

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

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S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TA
1	TATU A. MKETO	UB/KISIWANI	M/S/MTAA	0754407925	TMketo	10/1/
2	ZAINABU M. SHIZI	S/Mtaa UB/Kisiwani	AFISA MTENDAJI	0719810530	[signature]	10/1/
3	SARAH K. KAMANGA	UB/KISIWANI	M/S/MTAA	0719854840	[signature]	10/1/2
4	MWANAMKUU WAZIRI	UB/KISIWANI		0653-728886	[signature]	10/1/2
5	JOHN M. NDIMBO	Shina UB/Kisiwani	Mwenyekiti	0713245028	[signature]	10/1/2
6	Ridhiwani Athuma	UB/KISIWANI		071027773	[signature]	10/1/
7	AMAZON RASHIDI	UB/KISWANI	FUNDI	0684560769	[signature]	10/1/
8	MAKELELE NGOZI	UB/KISIWANI		0713367685	[signature]	10/1/
9	SARAJA MOHAMEDI	UB/KISIWAMI	MKAZI	0765533974	[signature]	10/
10	RUNGWE EPSS	UB/KISIWANI		068398835	GEOFREY	10/01/
11	THOMAS MGONDE	UB KISIWANI	FUNDI	0776107668	Mgonde	10/01
12	JUMA MYANZA	UB.KISIWANI	FUNDI	0719-470012	[signature]	10/01/2

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TA
1	GODFREY LYIMO			0788-092323	[signature]	11/01
2	Amza R. Mwombo		Mwananchi	0789498050	[signature]	11/01
3	Ramadhani S. Kafumu		//	0715423...	[signature]	-//
4	ALBERTO CHAWALA		Mwananchi	0713167100	[signature]	-//
5	HASSANI J. MWAMBULE		MWANANCHI	0713445128	[signature]	-
6	CHARLES BANZI		MF	0715474869	[signature]	—
7	HARIMA ZAHORO		—	0778439844	[signature]	—
8	JAMILA ZAWADI		-	0657718692	J.Zawadi	—
9	SIWEMA RASHIDI			0714696164	Z. Rashid	—
10	ESTHER JOHN			0788182537	E.JOHN	
11	WILLFRED PROTAS		—	0712-287044	[signature]	11/01
12	SLYVESTER M. MALIMA		—	0714-104821	[signature]	11/01

ABBREVIATED RAP AND ESIA FOR THE PROPOSED EXTENSION OF TRANSMISSION LINE AND SUBSTATION FROM MABIBO TO KIMARA, UBUNGO DISTRICT, DAR ES SALAAM REGION

STAKEHOLDERS SIGNATURE FORM

S/N	NAME/ JINA	INSTITUTION/TAASISI	POSITION/CHEO	CONTACT /SIMU	SIGN./SAHIHI	DATE/TA[illegible] 10/01/[illegible]
1	EMANUEL LYIMO	MIXA WA KIWONI	MV	0715729444	E. LYIMO	
2	VICTOR-VALENCE	-11-	MWANANCHI	0713680991	V.V	10/01/[illegible]
3	FRANCK WILLIAM MAKOPO	KISIWANI	MWANANCHI	0714-627213	[illegible]	10/01/[illegible]
4	FRATIANO ASSENSA	-11-	-11-	0713554627	[illegible]	10/01/[illegible]
5	MUNISHI KIBOSHO	-11-	-11-	0713-323073		10/01/[illegible]
6						
7						
8						
9						
10						
11						
12						

13.6 Minutes from Public Meetings

MUHTASARI WA KIKAO CHA WAKAZI WA MTAA KIBANGU ENEO LA CITY VIEW KILICHOFANYIKA TAREHE 16/01/2020.

MAHUDHURIO
REJEA KIAMBATANISHO NYUMA YA MUHTASARI.

AGENDA. NA 1. KUFUNGUA KIKAO.
Mwenyekiti alifungua kikao saa 9:58 Alasiri na kuwakaribisha wajumbe waliohudhuria.
Wajumbe walitikia salamu na kushukuru kwa kushirikishwa katika kikao hiki.

AGENDA NA 2. UTAMBULISHO.
Mwenyekiti alianza kwa utambulisho wa viongozi wa serikali ya Mtaa, wageni waliokuja kutoka taasisi ya Tanesco, pamoja na East Africa Energy group kwa niaba ya Tanesco, pamoja na East Africa Energy group kwa niaba ya city view wajitambulishe kuwataka wakazi wa eneo la city view wajitambulishe kikao hiki walijitambulisha kwa majina yao.
Wakazi waliohudhuria kikao hiki walijitambulisha kwa majina yao.

AGENDA NA 3. KUFANYA TATHIMINI YA ATHALI ZA KIMAZINGIRA NA KIJAMII; JUU YA MRADI WA UBADILISHAJI WA HIGHTENSION POWER LINE.

Mwenyekiti aliwakaribisha wageni kutoka East Africa Energy group ili kuwaeleza wananchi.
Mwakilishi wa taasisi ya East Africa Energy group — alishukuru wananchi kwa kuitikia wito, swala kuu la kikao ni kushirikisha jamii iliyopo eneo la mradi wa — high tension power line katika mradi unaotarajiwa kutekelezwa wa ubadilishaji wa extension ili kuweza kusafirisha umeme kwa double soket.
Line itakayotumika katika utekelezaji wa mradi ni ile inayotokea mabibo kwenda kinyerezi, kwa hapa tulipo ni hii ya upande wa kushoto, hivyo kunaweza kukafanyiwa tathimini baadhi ya nyumba na kulipwa fidia hasa eneo lile lenye kona ila kwa maeneo mengine hakutakuwa na nyumba itakayotwaliwa kutokana nguzo zitabadilishwa lakini zitapita katika zilizokuwepo toka zamani.
Aliendelea kueleza athari za kimazingira zinazowe-

Baada ya kuyaelezea hayo alowakaribisha wajumbe - wallohudhuria kuweza kutoa maoni yao.

Mjumbe mmoja alichangia kwa kusema mara baada ya kukamilika mradi huwa kuna maeneo yaliyo chi- mbika huwa yanaachwa na kusababisha mmomonyoko wa udongo na kupelekea athari kwa wakazi - waishio jirani na mradi, je katika mradi huu kuta- kuwa na marekebisho yatayofanyika.

Jibu :- Baada ya utekelezaji wa mradi kwa maeneo ambayo yatakuwa yameharibika kwa mmomonyoko wa - udongo, yatafanyiwa marekebisho ili kuzuia hali ya mmo monyoko kutokee.

Mjumbe mwingine alichangia kwa kuhukuru kushiriki shwa katika kujadili athari za kimazingira. na kijamii kabla ya kuanza kutekeleza mradi, na alitaka kutokana na maelezo mradi utakelezwa katika njia ya high tension power iliyokuwepo hivyo hata athari wakazi wataopo zipokuwa kwa nyumba chache zilizokuwepo eneo la - kona, je hizi nyumba chache zitazotwa alewa zoezi La - tathimini na fidia zitafanyika lini?

Jibu: kwa maeneo yatakayohitajika kutwaliwa zoezi la tathimini na uthamini wa fidia zitapatikana kufanyika wananchi watatarifiwa na kushirikishwa.

Mjumbe mwingine alitaka kuwa kutokana mnahitaji kuongeza extension kutoka njia moja na kuwa njia mbili je kwa wakazi waishio jirani na high extension power kawaata athirika, kutokana na ongezeko la nguvu ya umeme.

Jibu:- kutokana na makadirio ya umbali uliowekwa hakuna mwananchi atakae athirika kutokana na mionzi kwani technologia inayotumika ni ya kisasa na. imeondoa athari kwa wananchi, za kiafya.

Mwenyekiti aliwataka wakazi wajirani ya kuke - kumaliza maswali au kutoa mchango wao wa mawazo kwani ni nafasi ya kujadili kwa wote.

Mjumbe wa jirani ya kike aliuliza kuna jirani yake ameruta umeme kwenye nyumba yake sasa amepitisha nyaya

Jibu:- Alielezwa kuandika barua kwa Maandishi na kuiwasilisha ofisi za Tanesco, na kufatilia Majibu. Lakini Mtaalamu huyo aliahidi kulichukua na kulipeleka Tanesco ili kuweza kufanyiwa kazi swala hilo.

Mjumbe Mwingine aliuliza je zoezi la tathmini na kufanya malipo ya fidia litachukua muda gani na je litashirikisha wananchi ambao watakaonekana wamelta kwa kupisha Mradi.

Jibu: Zoezi la tathmini na kulipa fidia litapofikiwa kwa wananchi wote watajulishwa, na litakuwa shirikishi kwa kushirikisha wananchi, viongozi wa Mtaa.

AGENDA NA 4. KUFUNGA KIKAO.

Mwenyekiti aliwashukuru wananchi kwa ushiriki wao na utoaji wa Mawazo yao, na kufunga kikao saa 10:33 jioni.

HALMASHAURI YA MANISPAA YA UBUNGO
MWENYEKITI
SERIKALI YA MTAA
KIBANGU
KATA YA MAKUBURI

DESDERT ISHENGOMA
MWENYEKITI.

HALMASHAURI YA MANISPAA YA UBUNGO
AFISA MTENDAJI
TAR. 17/01/2020
MTAA WA KIBANGU

HAMISI A. MOTO
KATIBU

11/01/2020 HALMASHAURI YA MANISPAA YA UBUNGO

OFISI YA SERIKALI YA MTAA KILUNGULE Á na B

YAH: KIKAO CHA WANANCHI WA KILUNGULE A na B

KUHUSIANA NA MRADI WA TANESCO

Ajenda za kikao

① Kufungua kikao
② Utambulisho
③ Kuwakaribisha wataalamu wa TANESCO (mtoa mada)
④ Kufunga kikao

① Kufungua kikao

Mwenyekiti wa kikao na mwenyekiti wa Serikali wa Serikali ya mtaa wa kilungule B alifungua kikao na kutoa nafasi kikao kuendelea. Kikao kilifunguliwa mnamo muda wa saa kumi na moja jioni.

② Utambulisho

Mwenyekiti wa Serikali ya mtaa kilungule A alitoa nafasi kwa kila mmoja kujitambulisha na baadae kutoa mawazo yake kuhusiana na maada ambayo inaenda kuzungumzwa baada ya kusomewa ajenda za kikao.

③ Kuwakaribisha wataalamu wa TANESCO (mtoa maada)

Mwenyekiti wa kikao na mwenyekiti wa Serikali ya mtaa wa kilungule B alitoa nafasi kwa mtaalamu wa Tanesco/songas ili aweze kutoa elimu kwa wananchi, mtaalamu (muwezeshaji) aliwaelezea wananchi kuwa lengo la ujio wao ni kutoa elimu kuwa kunatarajia kuwa na mradi wa kuboresha miundombinu ya Umeme mkubwa Kutokea/kutoka kimasa Mavurunza—mpaka mabibo ili wananchi wawe na uelewa mzuri wa mradi huu na kisha kutoa maoni yao juu ya

Mwanandhi aliyeuliza Swali juu ya muda gani uta fiti utafanyika/utakwisha na ni muda gani/Lini ambao mradi unatarajia kuanza, mtoa mada wa TANESCO ali toa majibu ya kuridhisha kabisa utafiti unatarajia kuisha mwishoni mwa mwezi Februari na baada ya utafiti baada ya kufanyika ripoti itaenda/inawasilishwa kwa baraza la mazingira NEMC na mradi unatarajia kuanza mnamo mwezi machi ili kuleta tija kwa Taifa na Taifa/Nchi iweze kufikiza malengo yake.

Wanandhi waliuliza juu ya mtaalamu wa Tanesco atafumia Scope ipi/mipaka ipi kutekeleza kazi yake. kwa bahati nzuri mtoa mada alitoa majibu na ye- nye kuridhisha kuwa wanatoa/wanafanya kazi kwa kufu- ata mipaka ya Tanesco.

Kufunga kikao

Mwenyekiti wa kikao na mwenyekiti wa Serikali ya mtaa wa Kilungule "B" alifunga kikao mnamo muda wa saa moja kamili usiku na baadae wa- nandhi pamoja na wataalamu kutawanyika.

Kain Kyejo/Benjamin chuma
Mwenyekiti Kilungule

Joshua Gyunda
Mtendaji ~~kilungule~~ A

MUHTASARI WA MKUTANO KATI YA 10/1/2020
TAASISI YA EAST AFRICA RESOURCE GROUP NA WANANCHI WA MTAA WA KISIWANI KATIKA MAENEO YA TANESCO.

Kufungua Mkutano

- Mwenyekiti wa Mtaa alifungua Mkutano rasmi saa 6:15 Mchana kwa kuwakaribisha wananchi na wageni wa kutoka East africa resource Group waweze kujitambulisha ili wananchi wawatambue. Baada ya kufungua kikao Mwenyekiti aliwakaribisha wageni ambao wamefika kwa niaba ya tanesco.

- Taarifa ya Uboreshaji wa njia ya umeme.
  Mwakilishi kutoka taasisi ya East africa resource group amewaeleza wajumbe kuwa lengo ni eneo litakopitiwa kwa wakazi wa eneo wanahitaji kutoa taarifa kwa tanesco kuwa tanesco kupitisha umeme na nguzo za umeme na nguzo za umeme na kubadilisha nguzo kubwa.

- Hivyo ~~hii~~ hii taasisi inafanya utafiti na kuandaa wenye nguvu kubwa. ~~kal~~ ux kimazingira katika - Ripoti ya uthamini kupitisha nguzo hizo. maeneo hayo yanayotakiwa

- NAFASI YA KUCHANGIA HOJA MBALIMBALI MFANO (MASWALI, USHAURI, MAONI)

- RASHID KONDO
  Maoni, kwakuwa jambo ni kubwa na linagusa maoni ya watu ni vizuri kufutisha Mkutano nikubwa ili watu wote waweze kushiriki kwa nafasi na maka- sudio ya mkutano.

- HERRY MASWILA
  - Sheria Mbili ya Kitaifa na kimataifa ipi inafaa kutumika.

→ Mwenyekiti alitoa ufafanuzi kuwa suala kubwa hapo Mradi ukopo ni Uadilishaji wa nguzo hizyo wa-husika.

→ Mwakilishi kutoka East Africa resource group alieleza lengo la kuu Mkutano Mdogo ni Utimanishaji wa Umeme kwenye Maeneo yetu. Na baada ya utekelezaji wa Mradi kuna team itapita na kazi inayofanyika Muda huu — ndeyo ngia ya utekelezaji wa Mradi.

→ Taasisi inatarajia Mwishoni mwa ~~febrio~~ mwezi wa Pili kuweza kukamilisha Mradi na ~~kukamilisha~~ kazi baada ya — Repoti kwa taasisi ilyowapa kapo kazi itaanza kufanyika.

→ PAMELA MDAMI → Uazo labe ni kuitwa kikao ki-ngine kikubwa

→ RASHID KONDO — Ameuliza je mradi huu unatoka Kinyelezi kuelekea Mabibo unapita wapi?

→ Ambapo mwakilishi wa East Africa resource Group alijibu kuwa Umeme unaongezeka na ~~na~~ eneo la Kupitisha hizo nguzo zinatitaji kuwa hakuna — Shughuli zinazoendelea. Pia alisema kuwa kuna Surveyor anepita kuweka alama (bicones) maeneo ambayo nguzo zitapita.

(1)

MKUTANO WA DHARURA TAREHE 11/01/2020

Mkutano unefunguliwa muda wa saa 10:20

1. Kufungua Mkutano
2. KUTOA UFAFANUZI TANESCO
3. KUFUNGA MKUTANO

Mwenyekiti alitoa ufafanuzi Jun ya mwezi wa 4 2019 Tanesco walikuja na kutoa ufafanuzi kwa eneo la Tanesco kuna mpango wa kuboresha umeme kuanzia golani na kuelekea kutoka 130 – 220 ujenzi utakua mabibo wa kupoza umeme JAICA ndio ujenzi Tathimini katika mradi zinatakiwa, pia kutakua na muongozo, katika ardhi ya watu, Taasisi kuandaa muongozo mazingira watakao athirika kwa kuondolewa watafidiwa Timu ya Kampuni inapokea maoni/ushauri kuanzia ubungo watu watafidiwa. Kuhusu makaburi disaini ikionesha uzuro zitaanza kwa makaburi basi taratibu zitatumika kuhamisha.

alimkaribisha maoki kwa mwenyekiti

mjumbe ndombe:- alitaka kujua kutoka golani mita 5 na maramunza mita 30 upi ni umeme mkubwa, (ku

mjumbe mhando:- kuna watu hawakulipwa kabla itakuwaje

kwanini msisema ni ukubwa gani unahitajika ili watu waendelee maeneo yao na wengine wasubiri fidia.

alisema yeye sio mtaalam wa umeme lakini kama uzamaji wa umeme na sio ~~wazati~~ usafiri shaini.

kama changamoto TANESCO

⑥ => Kulipwa eneo kwaajili ya upimaji Tsh. 150,000/=

=> Shuma :- anaefaidika ni nani Serikali au JAICA

=> Njogopa :- Kutoa taarifa

=> Frances mhina :- mradi unaanza lini unaisha lini?

* Alama zipo bikoni hazina shida.
* Nani analipa fidia Serikali ndio analipa fidia / Tanesco
* Unaanza katikati ya februari / mradi kibali kutoka mazingira ndio kitafanya mradi uanze.

=> Mafrida :- watu kupita na kupima / tunaomba Tanesco kwaajili ya ufafanuzi.

=> Malima :- Kuna radi ilikua inapiga pale
* Kwa watu waliokuwa wamepima Tanesco ilidai hawahitaji eneo la zamani.
* Radi ni muendelezo wa kulinda eneo la mita 30

(15) karatasi x 12

MWENYEKITI,
JADI KAMUTI,

KATIBU
PENFORD P. KIZO

HALMASHAURI YA MANISPAA UBUNGO
AFISA MTENDAJI WA MTAA
MTAA WA MAVURUNZA