

APPENDIX-3

SITE SURVEY FOR OVER HEAD TRANSMISSION LINE



T-01 views from Main Road.
T-01 is dead-end tower to Addis Center Substation



Addis Center Substation at 7th July 2017.
A Plan for Substation modification is considered.



T-02 is kept in good condition.
Tower is located in median strip of two (2) lane road.



Tower T-02 views from main road.
No traffic on road due to Ramadan Holiday.





T-03 is kept in good condition.
Foundation was covered by embanked soil
due to ground level become higher
than original level.

Tower is located in median strip of
two (2) lane road.

Tower T-03 views from main road.
No traffic on road due to Ramadan Holiday.





T-04 has been damaged heavy.
Damages were repaired temporary
however, tower is in critical condition,
as one of main leg has been twisted completely.

Damages seems to be occurred in long time ago.

Tower is located in median strip of
two (2) lain road.

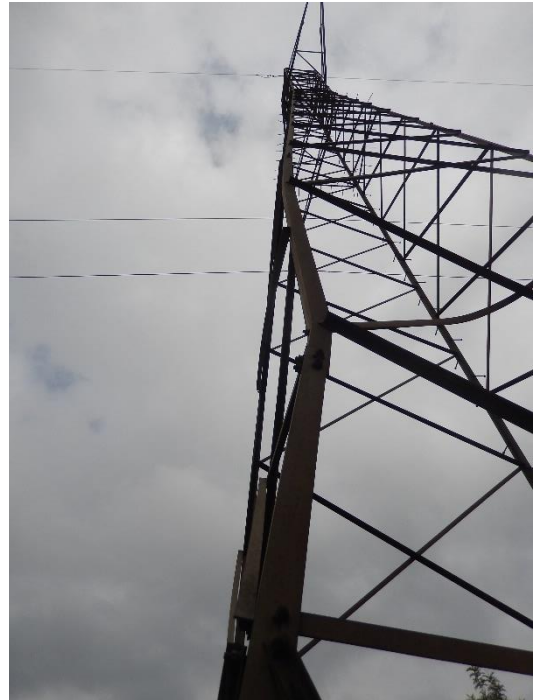
Tower T-04 views from main road.
No traffic on road due to Ramadan Holiday.





T-05 has been damaged heavy.
Damages are in critical condition,
as main legs have been twisted completely and
Secondary members of legs were out of function
due to deformation .

Damages seems to be occurred in long time ago.



Tower T-05 views from main road.
No traffic on road due to Ramadan Holiday.





T-06 is kept in good condition.
Tower is located in median strip of two (2) lane road.



Tower T-06 views from main road.
No traffic on road due to Ramadan Holiday.





T-07 has been damaged heavy. Damages are in critical condition, as main legs have been twisted completely and Secondary members of legs were out of function due to deformation .

Damages seems to be occurred in long time ago.



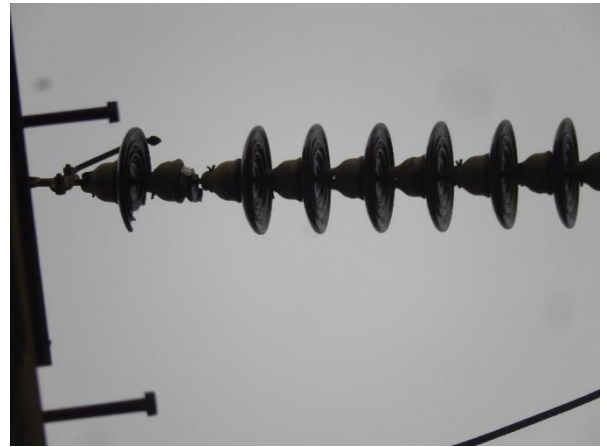
Tower T-07 views from main road toward T08.
No traffic on road due to Ramadan Holiday.





T-08 has been damaged heavy.
Damages are in critical condition,
as main legs have been twisted completely and
Secondary members of legs were out of function
due to deformation .

Insulator disc has been damaged.
It seems to be broken by shutting
as two (2) continuous discs were damaged.



Tower T-08 views from main road toward T09.
A section tower with deviation angle.
OPGW joint box is located,





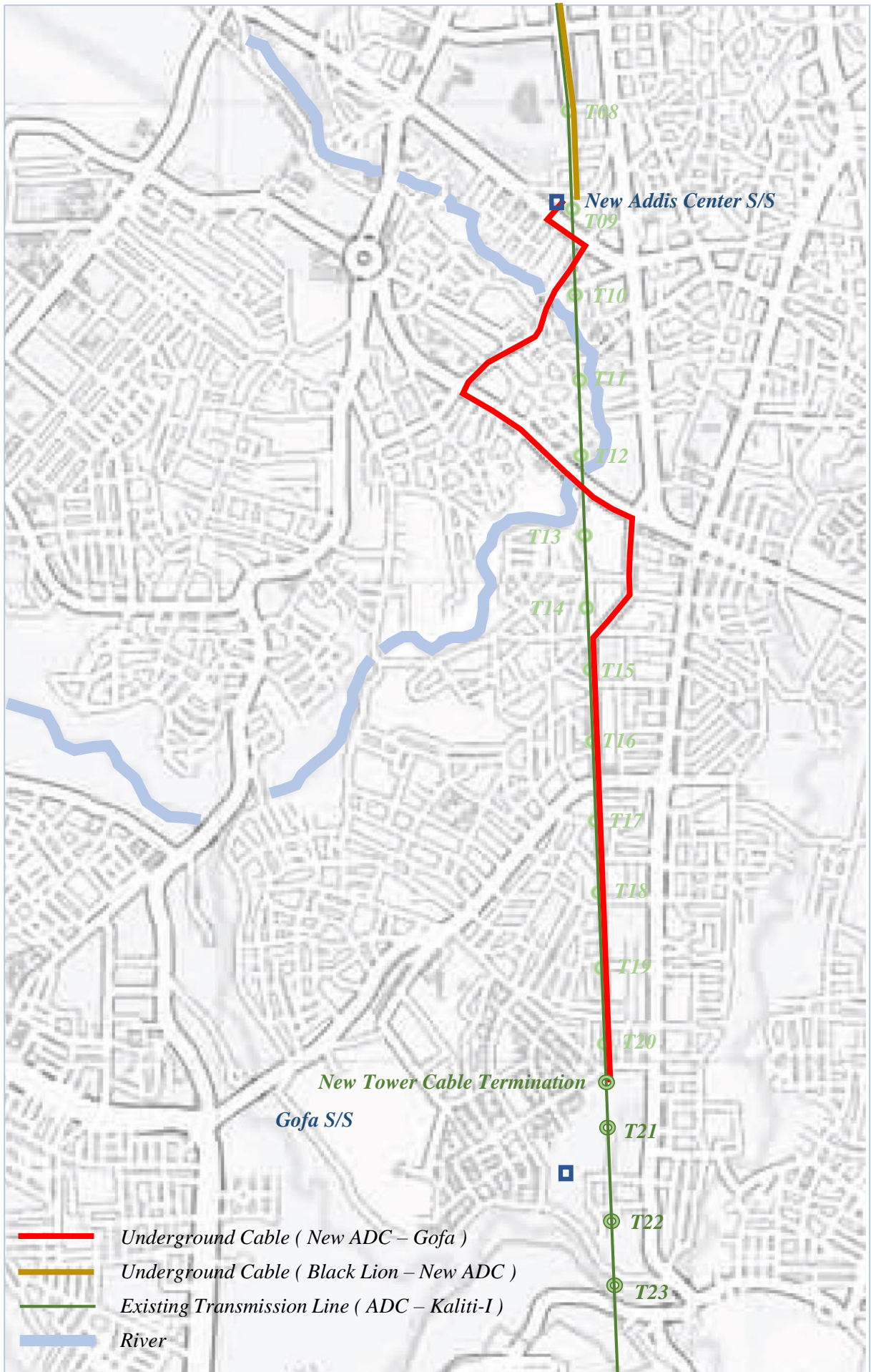
T-09 is kept in good condition.
Tower is located in main road.
One leg is located on walkway a little bit.

Tower location is fenced by party
other than EEP, access to tower is blocked.



Tower T-09 views from T08







T-10 is kept in good condition.
Tower is located inside the residential area,
surrounded by houses.
No vehicle access, only foot pass access.



Tower T-10 views from residential road.





T-11 is kept in good condition.
Tower is located inside the residential area,
surrounded by houses.
No vehicle access, only foot pass access.

River crossing between T10 and T11.



Tower T-11 views from foot pass.





T-12 is kept in good condition.
Tower is located in residencia area.

Many birds are observed around tower.



Tower T-02 views from main road.
No traffic on road due to Ramadan Holiday.





T-13 is located inside the land other than EPP.
Goat breeding area?

Access shall be made from main road through
Land user's access.



Tower T-13 views from residential road.

Photo right
View T13 from T14





Tower is located in ROW corridor.
Tower is slightly damaged.

Above : T-14 views from T13.

Right T 14 and ADC from T15 side.





T-15 has been damaged heavy.
Damages are in critical condition,
as main legs have been twisted completely and
Secondary members of legs were out of function
due to deformation .

Damages seems to be occurred in long time ago.



Tower T-15 views from ROW corridor.





T-16 has been damaged heavy.
Damages are in critical condition,
as main legs have been twisted completely and
Secondary members of legs were out of function
due to deformation .

Damages seems to be occurred in long time ago.



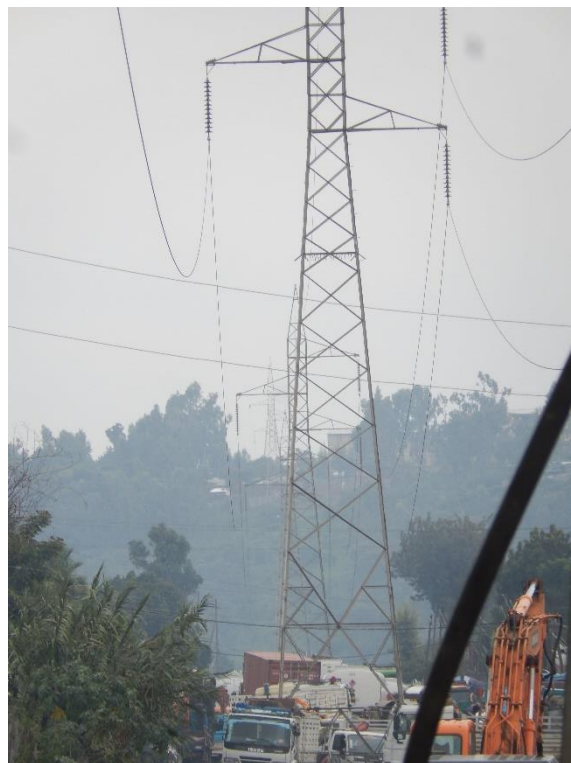
Tower T-16 views from ROW corridor.





Front tower is T-16, then T-17.

T-17 & T-18 have been damaged and inclined.
As seen from tower body was inclined.



Insulator assemblies were twisted due to tower inclined.





Tower 16 views from T17 side.
Road Construction is under progress on T17-T20.
T16 side is not started yet





This T17 has been damaged by activities of road construction and almost collapsed.

Insulator assemblies are inclined due to tower inclination.

Now conductor supports the tower.

Tower is in dangerous condition to collapse.





This T17 has been damaged by activities of road construction and almost collapsed.

Insulator assemblies are inclined due to tower inclination.

Now conductor supports the tower.

Tower is in dangerous condition to collapse.



Two (2) legs were bend and does not hold the tower weight anymore.





Remarks
Road Construction is under progress
between T17 and T20

Demolish existing houses under 30m corridor
(2 x 15meter both side center line)

Now excavation start on one side 15 meter

First Section of Road Construction between T17-T18.



Obstruction houses on right side has been removed now.
Tower 17 is damaged by construction and slightly declined.



Remarks
Road Construction is under progress
between T17 and T20

Demolish existing houses under 30m corridor
(2 x 15meter both side center line)

Now excavation start on one side 15 meter



T18 to T17 Demolish and removing houses and obstruction on the Corridor.



Construction of road starts on the half side of Corridor.
15kV Distribution Line will be demolished to shift it to new location outside corridor.

Parking vehicle has been removed already.
Tower foundation will be kept as original position



Remarks
Road Construction is under progress
between T17 and T20

Tower legs had been damaged heavily.
Tower inclined slightly.

Tower T-18 from T19 side



T18 Damaged Leg steels



Remarks
Road Construction is under progress
between T17 and T20

Tower legs had been damaged heavily.
Tower inclined slightly.



Tower T-21 from T20 side Existing road between T20 and T21.



T19 Damaged Steels



Remarks
Road Construction is under progress
between T17 and T20

Tower T-20 from T21 side Existing road between T20 and T21.



T20 on the slope toward existing road. Here will be end of new construction road



Tower T-20 from T21 side Existing road between T20 and T21.

Remarks
Road Construction is under progress
between T17 and T20



T20 on the slope toward existing road.



Photo taken from outside boundary fence.
Cable route toward boundary fence.



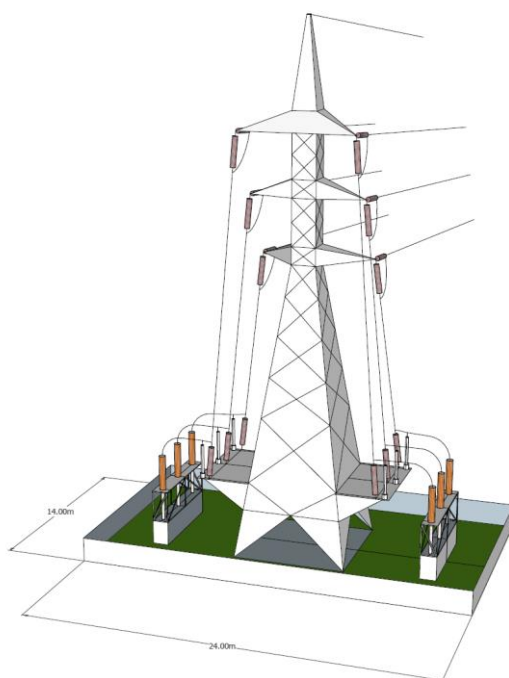
Gofa Substation
Front : Parkings for vehicle under corridor



Candidate site for Cable Termination Tower (70 – 80 m from T21
Near boundary fence of EEP store.



Site for Cable Termination Tower
at between T20 and T 21





T 21
DSCN0982 T21 view from T22 side Transposition Tower



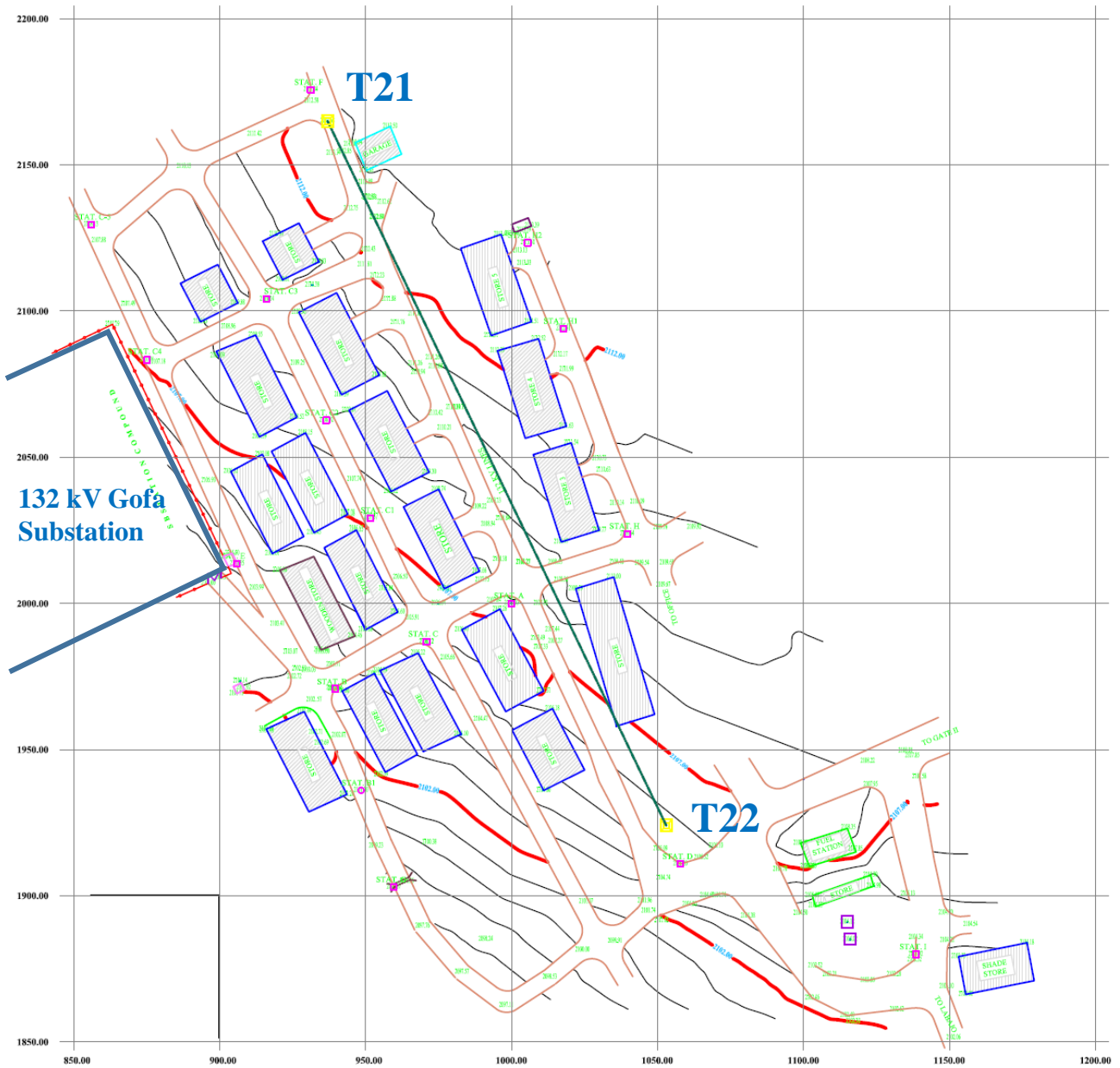
T21

T22

T 22
DSCN0982 T21&22 view from T24 Top of the hill

Remarks
Transmission Line ADC to Kaliti-I
Conductor’ transpositions are located at
Tower 21 – 22 – 23
and
Tower 39 – 40 – 41

T 21, T22 and T23 are located in Gofa
Store Warehouse own by EEP/EEU.



Goffa Store Road Topographic Survey on January 2000
180423 Goffa store road topographic map T22.dwg

REV.	DATE	DESCRIPTION OF REVISION	BY	CHKD.	APPD.
 <p>ETHIOPIAN ELECTRIC POWER CORPORATION ADDIS ABABA, ETHIOPIA</p> <p>GOFFA STORE</p> <p>GOFFA STORE ROAD TOPOGRAPHIC SURVEY</p>					
SURVYED	Kassaye Gobe				
DRAWN	Abeba G.Yohannes		08/01/2000	SCALE	1:500
DESIGNED					
CHECKED	Bahiru Tenker				
APPROVED	Alemayhu Woubshit				DWG.No A1



Gofa Substation (Addis South II)
P1130584 Gofa SS from T20 (photo 20th 2018 June)



Dead-end Tower toward Mekanissa substation
DSCN0273 DE Tower

Remarks

132kV Gofa Substation (Addis South II) is connected with Mekanissa Substation.

There is a plan to make T-Connection between Gofa SS at cable terminal dead-end T22. New double circuit (2cct) tower is planned to construction beside 1cct dead-end tower to Mekanissa SS.



T 22
DSCN0602 T22 view from T24 top hill



T 22
DSCN0983 T22 view from T21 : Transposition.



T 22
DSCN1001 T22 from T21 side 100m

Remarks
Transmission Line ADC to Kaliti-I
Conductor' transpositions are located at
Tower 21 – 22 – 23
and
Tower 39 – 40 – 41

T 21 and T22 are located in Gofa Store
Warehouse for EEP/EEU



T 23
DSCN0604 T23 view from T24 top hill



T 23
DSCN0601 T23&T22 ROW from T24



T 23
DSCN0614 T23&T22 ROW between T23 and T24

Remarks
Transmission Line ADC to Kaliti-I
Conductor' transpositions are located at
Tower 21 – 22 – 23
and
Tower 39 – 40 – 41

T 21 and T22 are located in Gofa Store
Warehouse for EEP/EEU



T 24
DSCN0596 T24 from T25 side 100m



T 23
DSCN0609 T24 toward T23&T22 in store warehouse.

Remarks

Some residential houses under transmission line between T 24 and T25

T 24 is located on the top hill. Approximate 45meter elevation up from T23 toward T24.

ROW (Corridor) is maintained between T23 and T24, however many houses were built beside the ROW.



T 25
DSCN0584 T25 from T26 side 50m

T 25
DSCN0598 T25 150m from T24



T 25
DSCN0592 T25 near existing road and fence

Remarks

A road for residential peoples are passed beside the T25. A house and apartment admonitory are constructed beside tower location.

T 25 is angle deviation tower, a new lattice type tower will be constructed on the same location of existing T25.



T 26
DSCN0579 T26 from T25 side



T 26
DSCN0582 T26 from T25 side showing Tree & ROW



T 26
DSCN0574 T26 from T27 side ROW house

Remarks
Works Shop is constructed under the tower.

There is a plan to construct road on the ROW (Corridor) of 132kV transmission line. Between T 24/25 and T31.



T 27
DSCN0572 T27 from T26 side



T 27
DSCN0571 T27 in front of gate to dormitory



T 26
DSCN0574 T26 from T27 side ROW house

Remarks

Tower is located in front of enter gate to apartment dormitory. New tower should be shifted to avoid traffic to this dormitory.

There is a plan to construct road on the ROW (Corridor) of 132kV transmission line. Between T 24/25 and T31.



T 28
DSCN0561 T28 from T27 side



T 28
DSCN0559 T28 toward T29



T 28
P1130586 T28 from T27

Remarks

There is a plan to construct road on the ROW (Corridor) of 132kV transmission line. Between T 24/25 and T31.



T 29
DSCN0561 T28 from T28 side



T 29
DSCN0554 T29 toward T30



T 29
P1130589 T29 from T30 side

Remarks

There is a plan to construct road on the ROW (Corridor) of 132kV transmission line. Between T 24/25 and T31.



T 30
DSCN0540 T30 from T 29 side



T 30
DSCN0554 ROW (Corridor) between T29 and T30



T 30
DSCN0552 T30 from T29

Remarks

There is a plan to construct road on the ROW (Corridor) of 132kV transmission line. Between T 24/25 and T31.



T 31
P1130595 T31 50m beside main road



T 31
DSCN0529 T31 Tower Legs are located in road edges.



T 30
DSCN0552 T30 from T29

Remarks

Tower T31 is located in narrow space and beside road. Special tower and foundation shall be designed.



T 32
DSCN0511 T32 from T33 side



ROW (Corridor) between T 31 and T32
P1130596 T32 view toward T31, many residential houses are existing.



T 32
DSCN0514 T32 Bottom gard blocks

Remarks

Many residential houses between T31 and T33.



T 33
DSCN0509 T33 from T32



T33
DSCN0499 T33 from side 100m. Heavy weight span due to ground profile level toward T34.



T 33
DSCN0502 T33 Bottom & to T34

Remarks

This tower has been damaged by traffic vehicle on the main leg. The Tower condition is very critical .



T 34
DSCN0484 T34 beside main road

T34
DSCN0494 T34 Elevation level of road is 5 meter higher than elevation of T34. Electrical clearance to road is not enough.



T 34
DSCN0485 T34 beside road. Water drain pipes for road are installed beside tower foundation.

Remarks

Elevation of road become much higher than tower foundation level, during embankment work for construction of road.

T34 become a section tower as T33 has a large weight span and T34 stand beside main road.



T 35
DSCN0708 T35 from T 36 side.



T35
Ground elevation level become higher than original ground due to embankment by construction of new industrial factory area.



T 35
DSCN0715 T35 from T36 side. Surrounding area of ROW (Corridor) become a part of industrial area, The elevation of the arear has been level up by embankment works.

Remarks

Industrial development works are on progress from T 34 toward Kaliti-I substation. Original foundation levels were below existing ground level.

The ground level will be more higher when development the surrounding area will be commenced



T 36 viewed from T35.
DSCN0707 T36. Tower is in inclineing.



T36
DSCN0717 T36 Bottom
Main leg was damaged and bent by soil pressures or hit by heavy equipment.



T 36
DSCN0906 T36 from T37 side.



Remarks

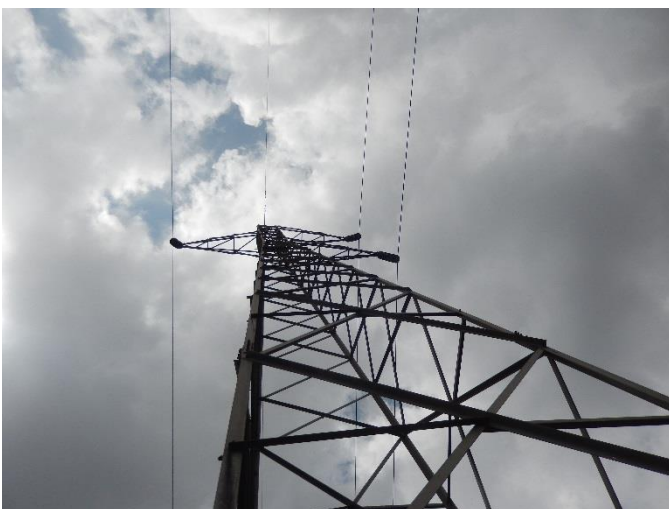
T36 is almost collapsed due to heavy damages on the leg. The suspension clamps hold conductor with unbalanced tensions. The condition of this tower is in very critical conditions.



T 37
DSCN0739 T37 from T38 side .
T 36 could see at far end.



T37
DSCN0913 T37 is located in vegetable garden where
is a small stream river beside. This area may not be
industrial area in future.



T 37
DSCN0737 T37 top Insulator swing

Remarks

Due to heavy unbalance on the T36, the
insulator strings has inclination on arms



T 38
DSCN0744 T38 from T37 side.
Tension tower with OPGW Joint Box.
The deviation angle is small.



T38
DSCN0743 T38 Ground Wire arm was damaged and bend. Arm can be callapes in any time.

The damage 33, 36 and 38 are so critical and remedial works required as soon as possible.



T 38
DSCN0741 T38 from T37.
Transmission line Kaliti-I to Nefas Silk is run in parallel with this ADC to Kaliti-I

Remarks

Ground wire (GW) was replaced by OPGW in last 10 years.

A deep river cross between T 38 and T39.



T 39
DSCN0768 T39 from T40.
T 39 – 40 -41 is transposition tower.



T39
DSCN0770 T39 & river.
Access bridge to cross river is for light weight only.
Vehicle is not accepted to cross.



T 39
DSCN0759 Access Bridge.
Mr Samuel : Strategy & Investment Department leads the site survey.

Remarks

Transposition tower at T39 - T40 – T41.



T 40
DSCN0772 T40 from T39 side.
The Conductor is inclined due to
transposition.



T40
DSCN0772 T40 from T39 side. Tower is located
inside the water treatment area with boundary fence.



T 40
DSCN0761 T40 Bottom Embankment

Remarks

Tower T40 is located at edge of embankment for development area which is used as water treatment.



T 40
DSCN0773 T41 foundation.
Embankment works were done around tower site/



T41
DSCN0785 T41 from T42 side.
Transmission line pass the area of water treatment.
An access road is belonging to water treatment.
ROW (Corridor) is not so clear, but no houses.



T 41
DSCN0775 T41 foundation level is much lower than
existing ground level of water treatment facility.

Remarks

Tower is located at edge of embankment for development area which is used as water treatment.



T 42
DSCN0783 T42.
Embankment works were done around tower site/



T42
DSCN0778 T42 from T41
Transmission line pass the area of water treatment.
An access road is belonging to water treatment.
ROW (Corridor) is not so clear, but no houses.



T 42
DSCN0784 T42 bottom
T42 foundation level is much lower than exiting ground level of water treatment facility.

Remarks

Tower is located at edge of embankment for development area which is used as water treatment.



T 43
DSCN0791 T43 side residential houses.
Hoses are constructed under ROW (Corridor)
after T 42 water treatment area.



T43
DSCN0788 T43 from T42
Along the fence for water treatment, many houses are
constructed. ROW (Corridor is disappeared).



T 43
DSCN0792 T43 beside houses.

Remarks

Transmission line pass above the roof of
residential houses.



T 44
DSCN0796 T44 from T43.



Toward T44

ROW under Corridor between T 43 and T44
DSCN0795 Access to T44
ROW is remained as small access.



T 44
DSCN0799 T44 from T43 side

Remarks

Ara from T 44 to Kaliti-I substation are developing as industrial area to construct new factory due to good access to main road and rail way terminal.



T 45
DSCN0801 T45 from T 44 side



T45
DSCN0805 ROW (Corridor) is maintained.



T 45
DSCN0802 T45 top plate are missing or not installed.

Remarks

Plates for cross arms are disappeared at compressed steel members.

The remedial works shall be arranged.



T 46
DSCN0806 T46 from T45 side/



T46
DSCN0809 A view from T 46 toward T47.
ROW (Corridor) is maintained.
New factories are constructed out side the ROW.



T 46 toward T47.
DSCN0811 T47 from T46

Remarks

Line pass the developing area.
Large embankment are expected to
construction road and area for new factory.



T 47
DSCN0812 T47 from T46 side.



T47
DSCN0814 A view from T47 to T46.
ROW (Corridor) is maintained.
New factories are constructed out side the ROW.



DSCN0819
T47.from T 48 side

Remarks

Elevation at T 48 is lowest between T 40
to Kaliti-I.



T 48
DSCN0820 T48 from T 47 side



T48
DSCN0826 T48 from 49
Plates for tower cross arm are missing



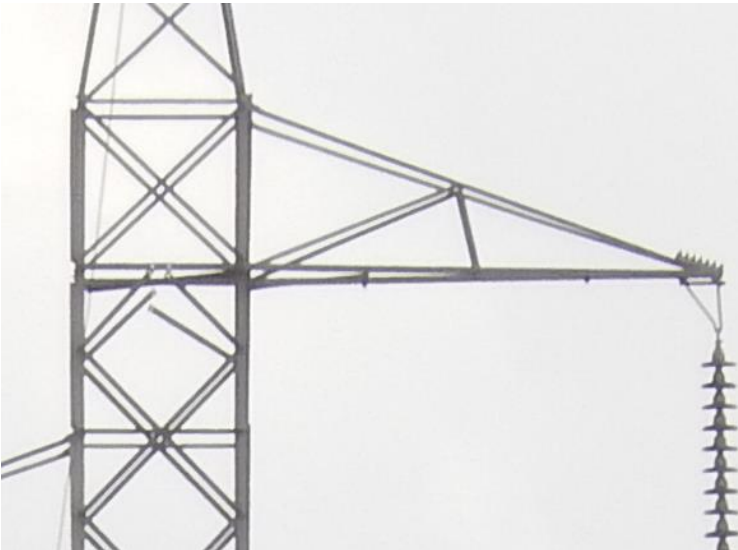
DSCN0818 T48 from T47



T 49
DSCN0834 T49 from T50



T 49
DSCN0823 T49 from T48



DSCN0824 T49 from T48
Plate missing, Steel members are not fixed by bolts.

Remarks

Plates for cross arms are disappeared at compressed steel members.

The remedial works shall be arranged.



T 50
DSCN0832 T50 from T49



T 50
DSCN0837 T50 from T51



DSCN0833 T50 bottom
Residential houses are existed toward T51.

Remarks

Many houses between T 50 and T51
This area is suitable for industrial area as
the short distance national road.



T 51
DSCN0836 T51 from T50



T 51
DSCN0835 T51 from T50



DSCN0838 T51 bottom
Residential houses are existed between T51 to T52.

Remarks

Many houses between T 51 and T52
This area is suitable for industrial area as
the short distance national road.



T 52
DSCN0847 T52 Top of hill



T 52
DSCN0843 Army monitoring house



DSCN0842 T52 bottom Leg Ext

Remarks
T 51 is suspension tower with small deviation angle.



T 53
DSCN0850 T53 & T54 & T55



T 52
DSCN0851 T53 is located inside Kaliti-I substation.



DSCN0844 View from T 52 toward T53 and T55
where are inside the Kaliti-I substation.

Remarks

The design of T53 as light angle is not same design with T 38 and T25.

Only small deviation angle on T 53.



T 54
DSCN0868 T54 from T55



T 54
DSCN0863 T54 bottom
Two legs are located out side the Kaliti-I Substation.



DSCN0865 T54 has many missing steel members.

Remarks

T 54 and T55 were newly constructed within a few year back.

T 54 is light angle tension tower for 220kV 2cct. Only one (1) cct was applied for ADC to Kaliti-I 132kV transmission line.

The tower erection is not completed yes as many steels are missing condition.



T 55
DSCN0866 T55 from T54
220kV Dead end tower.



T 55
DSCN0953 T55 from inside Kaliti-I substation.



DSCN0867 T55 bottom
T55 has many missing steel members.

Remarks

T 54 and T55 were newly constructed within a few year back.

T 55 is Ideadend tension tower for 220kV 2cct. Only one (1) cct was applied for ADC to Kaliti-I 132kV transmission line.

The tower erection is not completed yes as many steels are missing condition.



T 56
IMG_1117 T56 last tower to gantry



T 56
IMG_1244 down lead to gantry from T56 & T55



DSCN0960 T56 to gantry of Kaliti-I substation.

Remarks

Tower 56 was new number.
Original tower number was T54
having 90 degree angle to T 53 (no
tower T 54 and T55).



DSCN0167 Kaliti-I SS gantry

New additional feeders will be added beside existing feeder to ADC by shifting feeder bay of Mekanissa and Sebete.



T 62
DSCN0444 T-Branch to Weregenu
Substation



T 62
DSCN0454 Kaliti-I to Cotebie Transmission Line



DSCN0452 First horizontal members are all bent

Remarks
Foundation for all four legs are
damaged due to soil pressure from
surface.

Jumper shall be open when new
under ground cables are installed at
T67.



T 67
DSCN0387 New T-Branch to Weregenu
Substation



T 67
DSCN0367 New Tower will be located 30-40 meter
front of existing tower T67.



DSCN0379 T67 Second 132kV TL is just beside T67.

Remarks
New Cable Termination Tower will
be constructed by replacing T 67.



T52 Kaliti – Sebeta
Existing Foundation
No concrete Chimney for stub
DSCN2408



T52 Kaliti – Sebeta
Existing Foundation
Two steel angles were used for each leg to support tower



T52 Kaliti – Sebeta
Details of connection between stub and tower main leg.

