COMPENSATORY AFFORESTATION SCHEME FOR DEGRADED FOREST LAND OVER 2.7682 Ha. IN SEEPUR RF OF TALCHER RANGE FOR CONSTRUCTION OF DIVERSION PORTION OF EXISTING 400 KV DOUBLE CIRCUIT TALCHER - MERAMUNDALI TRANSMISSION LINE FROM LOC NO- 29 TO 32 IN ANGUL FOREST DIVISION ODISHA STATE

पावरग्रिड

Prepared by :-

Divisional Forest Officer,
Angul Forest Division

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SITE SUITABILITY CERTIFICATE FOR COMPENSATORY AFFORESTATION

This is to certify that the Seepur Reserve forest site selected for compensatory Afforestation (2.7682 Ha) against forest land diversion for construction of diversion portion of existing 400 kV Double Circuit (D/C) Talcher -Meramundali transmission line from loc no- 29 to 32 is suitable for Compensatory Afforestation purpose and the forest land is free from encroachment.

Divisional Forest Officer
Angul Forest Division

SCHEME FOR COMPENSATORY AFFORESTATION OVER 2.7682 Ha. IDENTIFIED IN SEEPUR RF OF TALCHER RANGE FOR DIVERSION OF 1.3841 HA. FOR CONSTRUCTION OF EXISTING 400 KV DOUBLE CIRCUIT TALCHER -MERAMUNDALI TRANSMISSION LINE FROM LOC NO- 29 TO 32 by POWER GRID CORPORATION OF INDIA LIMITED IN ANGUL FOREST DIVISION.

1. INTRODUCTION:

Since this project is a Central Sector Project, as per Para 3.2 (VII) of the guidelines of Forest Conservation Act, 1980 twice the extent of forest area to be diverted i.e 2.7682 ha. [1.3841 X 2 = 2.7682 ha.] of degraded forest land is required for taking up Compensatory Afforestation. The degraded forest land has been identified in Seepur RF of Talcher Range under Angul Tahasil in Angul district to compensate the loss of 1.3841. ha forest land proposed for diversion for DIVERSION PORTION OF EXISTING 400 KV DOUBLE CIRCUIT (D/C) TALCHER -MERAMUNDALI TRANSMISSION LINE FROM LOC NO- 29 TO 32 in Angul Forest Division.

The Compensatory Plantation Scheme for raising ANR Plantation @ 600 seedlings per ha over 2.7682 ha. in Seepur RF of Talcher Range has been prepared in favour of Power Grid Corporation of India Limited.

2. IDENTIFICATION OF THE DEGRADED FOREST AREA:

The degraded forest land for this purpose has been identified in Seepur RF of Talcher Range of Angul Forest Division in Angul District. The identified area is in 1 no. patch over 2.7682 ha. of degraded forest land (Topo Sheet No. F45N4). The area has been inspected by the Range Officer, Talcher Range and found suitable for taking up Compensatory Afforestation. The location map showing the proposed Compensatory Afforestation site inside Seepur RF over 2.7682 ha is shown in ***Plate-1***

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(a) Existing Vegetation:

The Seepur RF of Talcher Range of Angul District is situated approx 40 Km away from Talcher Range office . The head quarter of Talcher Range is Talcher. Sal (Shorea robusta) crop and its associate species like Bija (Pterocarpus marsupium), Asan (Terminalia tomentosa), Senha (Lagerstroemia parviflora), Dhaura (Anogeissus latifolia), Mahul (Madhuca indica), Char (Buchanania lanzan) & Kendu (Diospyros melanoxylon), Harida (Terminalia chebula), Bahada (Terminalia bellerica), Dhatki (Woodfordia fructicosa), Amla (Emblica officinalis), Karala etc. in bushy and pole stages are found in the identified degraded forest land. The slope is moderate and is suitable for carrying out plantation activities. The density of the vegetation is **10 to 40%.**

(b) Soil and topography:

(b) Soil and topography:

The topography of the area is mainly undulated terrain and having 20 % slope. The soil is sandy loam and gritty, hard compact and with some moorrum on the slope. Depth of the soil is fairly good. The soil is mainly devoid of humus and shallow in depth.

The topographical configuration of the selected site is suitable for undertaking plantation activities. The soil is mostly sandy loam to lateritic in some areas. For such characteristics, the scheme proposes to dovetail adequate soil and moisture conservation measures into the afforestation programme.

(c) Temperature:

The area experiences sub-tropical climate. It is characterized by very hot Summer and cool winter. Maximum temperature during summer rises up to 35-48 degree Celsius and in winter it goes down to 10-15 degree Celsius.

(d) Rain fall:

The area gets rain from South-East monsoon, which breaks during second fortnight of June and continues until last week of September. The annual rainfall varies from 1259.0 mm to 1441.0 mm. The annual rainfall average is 1350 mm. The bulk of precipitation occurs during July-August. During April-May, occasional rainfall occurs along with thunder storm.
The annual rain fall varies from 1200 mm to 1500 mm mostly received during rainy season from July to September.

3. OBJECTIVE OF THE SCHEME:

The main objective of the scheme is to restock the forest vegetation in Seepur RF under Talcher Range of Angul District by taking up silvicultural operation of the existing forest crop and supplementing it with ANR plantation in blanks patches. The scheme also envisages carrying out adequate and appropriate soil conservation measures along with the afforestation work so as to conserve soil and water for recharging the ground water table and to check erosion of the fertile top soil.

Principal Aims of the proposed scheme:-

(i) To rehabilitate the degraded forest land through plantation with suitable indigenous species.

(ii) To promote the growth of existing crop and root stock through suitable silvicultural practices.

(iv) To create a compact forest, which will be an asset for the local people from environmental, economic and aesthetic points of view.

(v) To help reduce environmental pollution.

ITEMS OF WORK TO BE TAKEN UP:

To achieve the objective narrated in the foregoing para, the following items of work are mainly prescribed to be taken up:

1. SURVEY AND DEMARCATION:

The proposed Compensatory Plantation Area has been surveyed and demarcated in the field by the User Agency at their cost by putting RCC pillars of 4' height at visible distance and has been checked by the Talcher Range officials of Forest Department. The fencing along the periphery of boundary of Reserve Forest will be done.

2. SOIL AND MOISTURE CONSERVATION.

Since the area is undulating, so soil and moisture conservation measures will be taken up by way of constructing small loose boulder structures and providing vegetative palisades as per site condition.

(i) LOOSE BOULDER STRUCUTRE

Taking into the consideration the degradation of the area due to soil erosion it has been proposed to take up Soil Conservation Measures by construction of Loose Boulder Structure over the area of size (1mt=5 Nos., 2mt = 5 Nos.& 3mt= 5 Nos.)

Name of the Range	Name of the site	Area in Ha.	Nos. of LBS		
			1mt	2mt	3mt
Talcher	Seepur RF	2.7682	5	5	5
			@ Rs.3592.- per LBS = **Rs.17960/-**	@ Rs. 7069.25/- per LBS = **Rs. 35346/-**	@ Rs. 15505/- per LBS= **Rs. 77525-**

The details of estimate of different size of Loose Boulder Structure are given in **the scheme.**

3. FENCING

As this area is adjourning to village forest area, there is every possibility of grazing by stray animal. It is therefore proposed for barbed wire fencing @ 668 per

3. FENCING

As this area is adjourning to village forest area, there is every possibility of grazing by stray animal. It is therefore proposed for barbed wire fencing @ 668 per RM along the surveyed boundaries to prevent grazing. barbed wire fencing will be done over 2.7682 ha. The perimeter of the CA area is around 715 Mtr. An amount of Rs.4,77,620.00 (wage rate of Rs. 286.30/- per day) will be required for taking up barbed wire fencing.

4. PROTECTION MEASURE:

The forest block has become degraded due to biotic interference and to save the area from the same, the following protection measures are to be adopted.

(a) Watch and ward.

The Compensatory area will have to be protected by engaging watchers for 5 years continuously, i.e. till establishment of the planted trees and natural saplings.

5. MONITORING AND EVALUATION

This scheme shall be executed and monitored by the Divisional Forest Officer, Angul Forest Division. Nursery and plantation journals shall be maintained regularly to facilitate monitoring and evaluation of the project.

6. CLEANING AND TENDERING OPERATION.

Regeneration cleaning of the area will be taken up during the pre-planting year by cutting of unwanted growth, high stumps and singling out of promising shoots of primary species where bushy forest growth is available.

7. PLANTING OF SEEDLINGS.

The proposed Compensatory Afforestation area will be planted by suitable species with a spacing of 2.5m x 2.5m and hence 600 nos of seedling per ha will be planted over 2.7682 ha. So 1661 nos of seedling will be required for planting over the entire area. As the entire area is prone to grazing, suitable indigenous species will be planted as detailed below.

1. Teak (Tectona grandis)
2. Sissoo (Dalbergia)
3. Gambhar (Gmelina arborea)
4. Amala (Emblica officinalis)
5. Bamboo (Dendrocalamus strictus)
6. Neem (Azadirachta indica)
7. Bel (Aegle marmelos)
8. Karanja (Pongamia pinnata)
9. Siris (Albizzia lebbek)
10. Khair (Acacia catechu)

For taking up plantation work, the following items of works are to be taken up.

(i) Raising of Nursery: -

The nursery will be raised for 1 year old seedlings during the pre-planting year. Potted seedlings will be planted @ 600 nos. per Ha i.e 1661 nos over the total area. For the purpose 1828 seedling are to be raised.

(ii) Survey demarcation, staking and digging of pits :-

A treatment map will be prepared for the area. Pits of size 30 CM X30 CM X30 CM will be dug with spacing of 2.5 mts X 2.5 mts during January - March, which will help in weathering of pits. Concrete masonry pillars will be constructed along the boundary of the above forest area during demarcation. The area shall be divided in to small patches in the field with proper demarcation to facilitate management/inspection and the same shall also be shown on the treatment map.

PLANTATION YEAR.

(i) **Application of Farmyard Manure, Chemical Fertilizer and Insecticides : -**

To enhance fertility, farmyard manure will be applied in the pits during June after scooping of the pits. Chemical fertilizer (N.P.K) as basal dose @ 50 gms per plant will be applied at the time of planting. To save the planted seedlings from termite attack, Aldrin dust or some effective insecticides will be applied at the time of planting.

(ii) **Planting: -**

Planting of seedling will be done during the mid July after the onset of monsoon. The soil and water conservation works will be taken up before the rains.

(iii) **Weeding, Soil Working, Manuring, Casualty Replacement. : -**

1st weeding and soil working will be taken up during 1st week of August or just after establishment of planted seedlings. Soil working at 0.5 m radius around the seedling planted will be taken up. The casualties will be replaced simultaneously.

2nd weeding will be done during 2nd F.N of September or 1st week of October. 2nd dose of chemicals fertilizer @ 50 gms per plant will be applied in the crowbar holes during 2nd weeding.

(iv) Grass cutting and fire tracing: -

To save the area from fire damage, dry grasses shall be cut in lines of 1.5 mtr width around the plantation. The dry grasses shall either be shifted or burnt in-situ with care to avoid fire hazard during summer.

(v) Watch & ward:

Watchers shall be engaged for watch & ward of the plantation area against biotic interference, fire hazards etc throughout the year as per the approved cost norm.

2ND YEAR OPERATION.

During the second year operation the following works will be taken up.

(i) **1st weeding, casualty replacement and application of chemical fertilizer.:-**

Weeding will be taken up during Ist week of July. Soil working with 0.5 mt radius will be done alongwith the replacement of 10% casualties and application of chemical fertilizer @ 50 gms per plant in crow bar holes. Precaution should be taken for conservation of soil and water at the time of soil working.

(ii) **2nd weeding and mulching :**

2nd weeding will be done during 1st F.N of October. Mulching of the plant sides will be done for conservation of moistures.

(iii) **Grass cutting and fire tracing :**

Cutting of dry grasses and fire tracing will be done during December and January like previous year.

(iii) **Watch & Ward: -**

Watchers to be engaged for the whole year as like previous year.

3RD YEAR OPERATION.

(i) Weeding pruning and deep soil working.:

Weeding and deep soil working will be taken up during July and August. Pruning of planted trees and tending of natural species will be done during November.

(ii) Grass cutting and fire tracing:

Like previous years grass cutting and fire tracing will be done during December/ January.

(iii) Watch and Ward:

Watchers shall be engaged for the whole year as in previous years.

4TH YEAR OPERATION.

(i)Cleaning and pruning:

Cleaning of existing crop and Pruning of planted trees will be taken up during December/ January.

(ii)Fire Tracing:

Like previous years grass cutting and fire tracing will be done during December/ January.

(iii)Watch and Ward:

Watchers will be engaged for the whole year as like previous years.

5TH YEAR OPERATION.

(i)Cleaning and pruning:

Cleaning of existing crop and pruning of planted trees will be done during December/ January.

(ii)Grass cutting and fire tracing:

As like previous years, grass cutting and fire tracing will be done during December /January.

(iii)Watch and ward:

Watchers will be engaged for the whole year as like previous years.

6TH YEAR OPERATION.

(i)Cleaning and pruning:

Cleaning of existing crop and pruning of planted trees will be done during December/ January.

(ii)Grass cutting and fire tracing:

As like previous years, grass cutting and fire tracing will be done during December /January.

(iii)Watch and ward:

Watchers will be engaged for the whole year as like previous years.

7TH YEAR OPERATION.

(i)Cleaning and pruning:

Cleaning of existing crop and pruning of planted trees will be done during December/ January.

(ii)Grass cutting and fire tracing:

As like previous years, grass cutting and fire tracing will be done during December /January.

(iii)Watch and ward:

Watchers will be engaged for the whole year as like previous years.

8TH YEAR OPERATION.

(i)Cleaning and pruning:

Cleaning of existing crop and pruning of planted trees will be done during December/ January.

(ii)Grass cutting and fire tracing:

As like previous years, grass cutting and fire tracing will be done during December /January.

(iii)Watch and ward:

Watchers will be engaged for the whole year as like previous years.

9TH YEAR OPERATION.

(i)Cleaning and pruning:

Cleaning of existing crop and pruning of planted trees will be done during December/ January.

(ii)Grass cutting and fire tracing:

As like previous years, grass cutting and fire tracing will be done during December /January.

(iii)Watch and ward:

Watchers will be engaged for the whole year as like previous years.

10TH YEAR OPERATION.

(i)Cleaning and pruning:

Cleaning of existing crop and pruning of planted trees will be done during December/ January.

(ii)Grass cutting and fire tracing:

As like previous years, grass cutting and fire tracing will be done during December /January.

(iii)Watch and ward:

Watchers will be engaged for the whole year as like previous years.

G.P.S. READING OF SURVEYED POINTS

G.P.S. reading taken up in Seepur RF of Talcher Range in different patches pertaining to Angul Forest Division for compensatory afforestation purpose by M/S POWER GRID CORPORATION OF INDIA Ltd. is furnished in the **Annexure-D**. The

hatching yellow marked areas have been set aside for ANR plantation (600 Plants/Ha.).

Annexure A ... *Details of item wise financial outlay for afforestation.*

Annexure B .... *Cost norm of ANR Plantation from Annexure-B.*

Annexure C ... *Cost norm of Loose Boulder Structure (S.C.M.).*

Annexure D ... *GPS reading of ANR plantation area patch wise.*

Plate 1 ... *Location shown in Topo Sheet No. F45N4.*

Annexure-A

DETAILS OF ITEM-WISE FINANCIAL OUTLAY FOR AFFORESTATION.

Sl No.	Item of work	Total outlay
01	ANR Plantation over 2.7682 ha. @ Rs.64655.65/- per ha =1,78,980/- (Estimate for one Ha is kept at Annexure-B)	1,78,980.00
02	Barbed Wire Fencing around the Perimeter of the CA Area approximately 715 Mtr @ 668 Per RM	4,77,620.00
03	SCM (Loose boulder structure 1mt. = 5 nos., 2mt.=5 nos., 3mt.=5nos.) (Estimate for 1 no. is kept at Annexure-**C**)	1,30,831.00
	Sub-Total	**7,87,431.00**
07	Escalation cost @ 20%	**1,57,486.00**
	Grand Total	**9,44,917.00**

(Rupees Nine Lakhs Forty Four Thousand Nine Hundred Seventeen only).

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Annexure-B

COST ESTIMATE FOR ASSISTED NATURAL REGENERATION OF DEGRADED FOREST (ANR) PLANTATION OF 600 SEEDLINGS/HECT.

1.	Type of the Plantation.	ANR Plantation.
2.	No. of seedlings to be planted.	600 Nos. per hectare
3.	Spacing to be adopted.	2.5m x 2.5m
4.	Size of pits.	30cm x 30cm x 30cm
5.	Wage rate.	Rs.286.30 per manday.
6.	Species to be planted.	1. Teak (Tectona grandis) 2. Sissoo (Dalbergia) 3. Gambhar (Gmelina arborea) 4. Amala (Emblica officinalis) 5. Bamboo (Dendrocalamus strictus) 6. Neem (Azadirachta indica) 7. Bel (Aegle marmelos) 8. Karanja (Pongamia pinnata) 9. Siris (Albizzia lebbek) 10. Khair (Acacia catechu)
7.	The user agency will pay the wage rate as and when enhanced.	

0th year (Advance work) Pre-planting operation.

Sl. No.	Item of work	Mandays	**Labour rate @ Rs.286.30/day**	Material cost.	Total.
1	2	3	4	5	6
1.	Survey, Demarcation & pillar posting, GPS reading with mapping	2	572.60	-	572.60
2.	Site preparation.	2	572.60	-	572.60
3.	Sivicultural Operation including clearance of weed, climber cutting, high stump cutting, singling of shoots	5	1431.50	-	1431.50
4.	Raising nursery @660 seedling/Ha (including 10% casualty replacement) and watch and ward(part-I)	16.5	4723.95	1102	5825.95
5.	Contingency and unforeseen expenditure	0	0	198	198.0
	Sub Total	**25.5**	**7300.65**	**1300**	**8600.65**
	1st Year/ Planting				

1	Maintenance of Nursery (Balance)	8	2290.40	235	812.00
2	Pitting 30cm cube size	18	5153.4	-	1680
3	Carriage and planting including casualty replacement	15	4294.50	-	1400
4	Complete wedding, soil working, Manuring	18	5153.4	-	1680
5	Cost of Vermi compost and Insectide for plantation	0	0	2640	880.00
6	Cost of chemical fertilizer	0	0	972	324.00
7	Fire line tracing and inspection path	15	4294.50	-	840
8	Silvicultural operation involving clearance of weeds, cutting of climbers and sigling of shoots on each stool etc.	20	5726.00	-	4200
9	Watch and ward	3	858.90	-	1960
10	Soil Conservation measures	7	2004.10	-	5600
11	Contingencies and unforeseen expenditure	0	0	353	304.00
	Sub Total	**104**	**29775.20**	**4200.00**	**33975.20**
2nd Year Maintenance					
1	Casualty replacement including cost of seedling, carriage and planting.	3	858.90	567.0	1425.90
2	Complete Weeding and prunning.	6	1717.80	0	1717.80
3	Soil working and manuring	6	1717.80	0	1717.80
4	Cost of fertilizer and insecticide	0	0	2424.00	2424.00
5	Soil Conservation measures	8	2290.40	0	2290.40
6	Fire line tracing and Inspection path	1	286.30	0	286.30
7	Watch and ward (Whole Year)	7	2004.10	0	2004.10
8	Contingencies and unforeseen expenditure.	0	0	193.00	193.00
	Sub Total	**31**	**8875.30**	**3184.0**	**12059.30**
3rd Year maintenance					
1	Complete Weeding and prunning.	3	858.90	0	858.90
2	Soil working	3	858.90	0	858.90
3	Fire line tracing and Inspection path	1	286.10	0	286.10
4	Watch and ward (Whole Year)	7	2004.10	0	2004.10
	Sub Total	**14**	**4008.20**	**0**	**4008.20**
4th Year maintenance					
1	Fire line tracing and Inspection path	1	286.30	0	286.30

2	Prunning, Watch and ward	2	572.60	0	572.60
Sub Total		**3**	**858.90**	0	**858.90**
5thYear Year maintenance					
1	Fire line tracing and Inspection path	1	286.30	0	286.30
2	Prunning, Watch and ward	2	572.60	0	572.60
Sub Total		**3**	**858.90**	0	**858.90**
6th Year maintenance					
1	Fire line tracing and Inspection path	1	286.30	0	286.30
2	Prunning, Watch and ward	3	572.60	0	572.60
Sub Total		**3**	**858.90**	0	**858.90**
7thYear Year maintenance					
1	Fire line tracing and Inspection path	1	286.30	0	286.30
2	Prunning, Watch and ward	2	572.60	0	572.60
Sub Total		**3**	**858.90**	0	**858.90**
8th Year maintenance					
1	Fire line tracing and Inspection path	1	286.30	0	286.30
2	Prunning, Watch and ward	2	572.60	0	572.60
Sub Total		**3**	**858.90**	**0**	**858.90**
9thYear Year maintenance					
1	Fire line tracing and Inspection path	1	286.30	0	286.30
2	Prunning, Watch and ward	2	572.60	0	572.60
Sub Total		**3**	**858.90**	**0**	**858.90**
10th Year maintenance					
1	Fire line tracing and Inspection path	1	286.30	0	286.30
2	Prunning, Watch and ward	2	572.60	0	572.60
Sub Total		**3**	**858.90**	**0**	**858.90**

Abstract

Year	Person Days	Labour	Material	Total
0th Year	25.5	7300.65	1300	8600.65
1st. Year	104	29775.20	4200.00	33975.20
2nd. Year	31	8875.30	3184.0	12059.30
3rd. Year	14	4008.20	0	4008.20
4th Year	3	858.90	0	858.90
5th Year	3	858.90	0	858.90
6th Year	3	858.90	0	858.90
7th Year	3	858.90	0	858.90
8th Year	3	858.90	0	858.90
9th Year	3	858.90	0	858.90
10th Year	3	858.90	0	858.90
Total	**195.50**	**55971.65**	**8684.00**	**64655.65**

Cost for Plantation in 2.7682 Ha ANR mode X Rs. 64655.65 = Rs. 1,78,980.00

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Annexure-C

I. **Detail Estimate of Loose Boulder Structure (S.C.M.)**
Span-1 mt. Ht. = 0.6 mt. Slope-U/S:- 1:1.5 D/S slope: 1:2

1. Leveling the unshaped surface of the selected Site & layout the structure foundation L.S. 1 MD.			**Rs. 286.30**
2. Excavation of foundation in hard soil within initial lead of 50 mtr. Including rough dressing and breaking of clods to maximum size 5 cm. to 7 cm. laying in layer not exceeding 0.3 in depth to strengthening both side U/S approx. bund of loose boulder structure. Base with apron- 1 x 3.60 x 1.60 x 0.30 = Wing wall – 4 x 0.50 x 0.30 x 0.30= **@ Rs. 8664.75 per 100 cum.**	1.728 0.180	1.908 cum	**Rs. 165.32**
3. Rough stone dry packing up to GL Base with apron – 1 x 3.60 x 1.60 x 0.30= Wing wall – 4 x 0.50 x 0.30 x 0.30= Above GL Super structure- 1 x 1.00 x $\frac{2.60 + 0.50}{2}$ x 0.60 = Wing wall – 4 x 0.50 x 0.30 x 0.30 = Side wall- i. 2 x ($\frac{0.3+0.9}{2}$) x0.9 x 0.3 = ii. 2 x ($\frac{0.3 + 0.9}{2}$) x 1.2 x 0.3 = iii. 2 x 0.5 x 0.9 x 0.3 = iv. 2 x 1.0 x 0.3 x 0.3 = **@Rs. 743.35 per cum.**	1.728 0.180 0.930 0.180 0.324 0.432 0.270 0.180 2.316 cum	1.908 cum **4.224 cum**	**Rs. 3139.92**
		G. Total	**Rs. 3592.00**

(Rupees Three Thousand five hundred ninety two only)

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II. Detail Estimate of Loose Boulder Structure (S.C.M.)
Span-2 mt. Ht. = 0.6 mt. Slope-U/S:- 1:1.5 D/S slope: 1:2

1. Leveling the unshaped surface of the selected site & layout the structure foundation L.S. 1 MD.		Rs. 286.30
2. Excavation of foundation in hard soil within initial lead of 50 mtr. including rough dressing and breaking of clods to maximum size 5 cm. to 7 cm. laying in layer not exceeding 0.3 in depth to strengthening both side U/S approx. bund of loose boulder structure. Base with apron- 1 x 3.70 x 3.00 x 0.30 = Wing wall – 4 x 0.50 x 0.50 x 0.30= **@ Rs. 9080.10 per 100 cum.**	3.33 0.30 3.63 cum	Rs. 329.60
3. Rough stone dry packing up to GL Base with apron – 1 x 3.70 x 3.00 x 0.30= Wing wall – 4 x 0.50 x 0.50 x 0.30= Above GL Super structure- 1 x 2.00 x $\frac{2.70 + 0.60}{2}$ x 0.60 = Wing wall – 4 x 0.50 x 0.50 x 0.50 = Side wall- i. 2 x $\frac{0.50+1.10}{2}$ x 0.9 x 0.5 = ii. 2 x $\frac{0.5 + 1.10}{2}$ x 1.2 x 0.5 = iii. 2 x 0.6 x 0.6 x 0.5 = iv. 2 x 1.0 x 0.5 x 0.5 = **@ Rs. 779.15 per cum**	3.33 0.30 1.98 0.50 0.72 0.96 0.36 0.50 8.65 cum	Rs. 6739.65
		G. Total Rs. 7069.25

(Rupees Seven thousand Sixty Nine only)

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Detail Estimate of Loose Boulder Structure (S.C.M.)
Span-3 mt. Ht. = 1.0mt. Slope-U/S:- 1:1.5 D/S slope: 1:2.0

1. Leveling the unshaped surface of the selected site & layout the structure foundation L.S. 1 MD.		**Rs.286.30**
2. Excavation of foundation in hard soil within initial lead of 50 mtr. including rough dressing and breaking of clods to maximum size 5 cm. to 7 cm. laying in layer not exceeding 0.3 in depth to strengthening both side U/S approx. bund of loose boulder structure. Base with apron- 1 x 5.10 x 4.00 x 0.30 = Wing wall – 4 x 0.50 x 0.50 x 0.30= **@ Rs. 9353.63 per 100 cum.**	6.12 0.30 6.42 cum	**Rs. 600.55**
3. Rough stone dry packing up to GL Base with apron – 1 x 5.10 x 4.00 x 0.30= Wing wall – 4 x 0.50 x 0.50 x 0.30= Above GL Super structure- 1 x $\frac{4.10 + 0.60}{2}$ x 1.00 x 3.0 = Wing wall – 4 x 0.50 x 0.50 x 0.50 = Side wall- i. 2 x $\frac{0.50+1.50}{2}$ x 1.5 x 0.5 = ii. 2 x $\frac{0.5 +1.50}{2}$ x 2.0 x 0.5 = iii. 2 x 0.6 x 1.0 x 0.5 = iv. 2 x 1.0 x 0.5 x 0.5 = **@ Rs. 802.60 per cum**	6.12 0.30 7.05 0.50 1.50 2.00 0.60 0.50 **18.57 cum**	**Rs.14904.50**
		G. Total Rs. 15505.00

(Rupees Fifteen thousand five hundred five only)

आर. एल. पंडा
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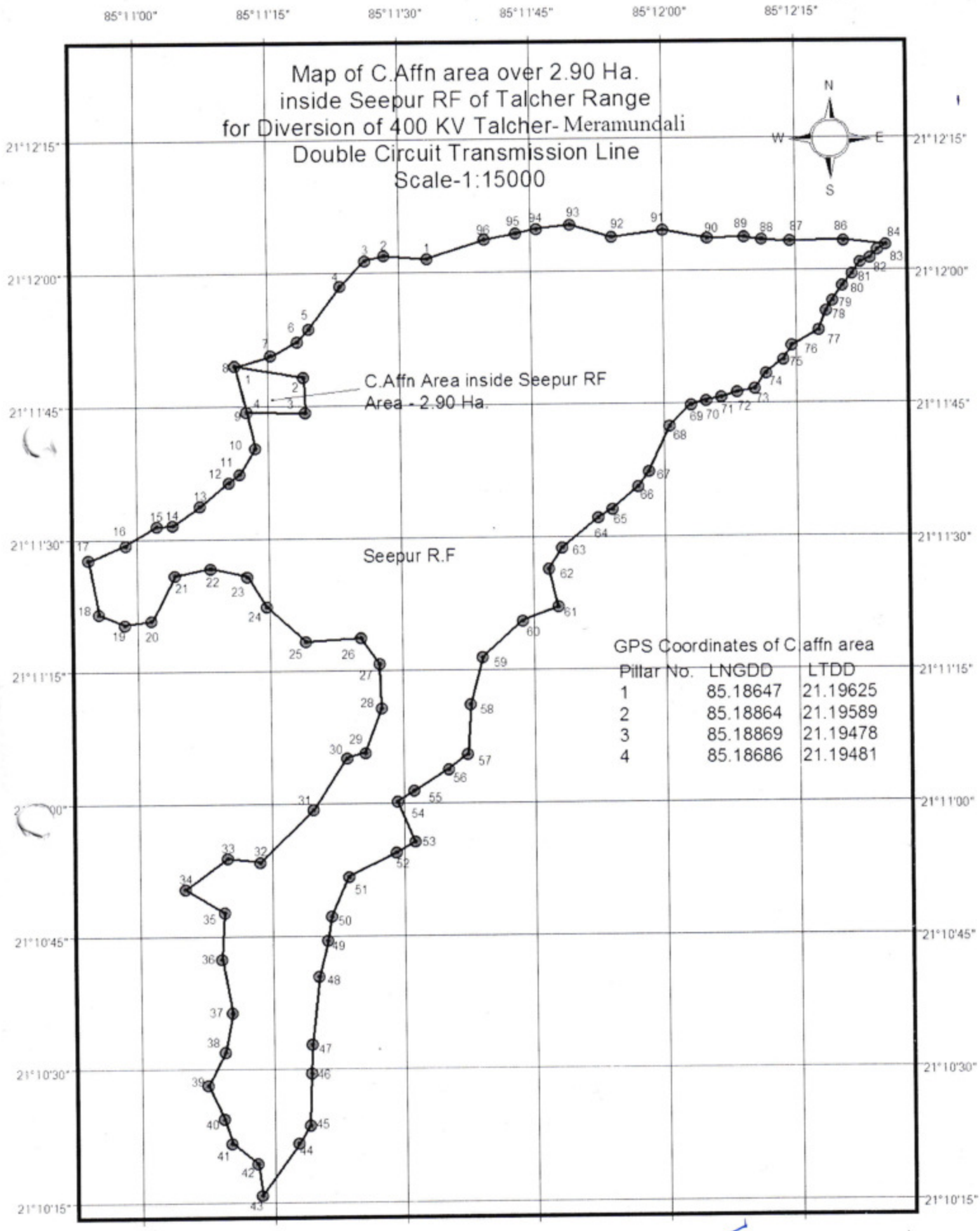
Sr. G.M., POWERGRID, Kaniha

Divisional Forest Officer,
Angul Forest Division

Divisional Forest Officer
Angul, Division

GPS Reading of CA Area with Map

Annexure - D



GPS Coordinates of C affn area

Pillar No.	LNGDD	LTDD
1	85.18647	21.19625
2	85.18864	21.19589
3	85.18869	21.19478
4	85.18686	21.19481

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