COMPENSATORY AFFORESTATION SCHEME

of

SIARMAL OPENCAST PROJECT

of

MAHALAXMI AREA, MCL

Mahanadi Coalfields Limited
(A Subsidiary of Coal India Limited)
Jagruti Vihar, Burla, Sambalpur

Prepared by
Divisional Forest Officer,
Sundargarh Forest Division
Sundargarh

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1. Introduction

Siarmal OCP is consisting of Siarmal, Siarmal Extension and Banapatra blocks and located in north-western central part of Ib River coalfield of Odisha, known as Gopalpur sector. The Ib River coalfield lies in between latitude 21º31' to 22º14' North and longitude 83º32'00" to 84º10'00" East and falls mainly in Sundargarh, Jharsuguda and Sambalpur districts of Odisha.District headquarter Sundargarh, on State Highway-10 (Sambalpur to Rourkela), is at a distance of about 46 km. from the blocks. The Sundargarh (Odisha) – Raigarh (Chattisgarh) all weather road passes through the blocks. The blocks are also connected by black top road with two important towns of Odisha namely Rourkela at 145 km and Jharsuguda at 75 km. The blocks come under Himgir Tahsil and Balinga police station in the district of Sundargarh, Odisha. The blocks are around 6 km. south west of Basundhara West Colliery and are connected by part metallic road. The blocks are connected by road to the state capital Bhubaneswar through State Highway-10 and National Highway-42, with a total distance of around 450 km. The blocks are well connected with MCL HQ at Sambalpur situated at a distance of about 100 km. The Nearest railhead is Hemgir, on Mumbai-Howrah Broad Gauge of South Eastern Railway at a distance of about 35 km from the blocks. Jharsuguda railway station on Jharsuguda-Sambalpur-Bhubaneswar rail line of East Coast Railway is at a distance of about 75 km. The nearest port at Bay of Bengal is Paradip and situated at a distance of about 600 km. from the block. The Jharsuguda Airport, is the nearest airport from the block(Approx. 45 KM). This project is an open cast mining project having 1547.82 MT of quarriable coal reserve in Siarmal, Gopalpur, Ratansara, Jhupurunga, Tumulia and Kulda villages.The Siarmal OCP has got a life span of 39 years. The project extends over an area of 2290.449 Ha of tenancy land, forest land and Non-Forest land as detailed below:

Sl. No.	Type of Land	Area in Hectares
1.	Revenue Forest Land	349.709 Ha.
2.	Govt. Non-Forest Land	448.843 Ha.
3.	Tenancy Land	1491.898 Ha.
Total Land		2290.449 .

2. Forest Land Involved

Out of the total land requirement of 2290.449 Ha, the Siarmal OCP involves 349.709 Ha including 3.930 Ha of forest safety zone, which is to be diverted for non-forestry purpose. The detailed Land schedule of Forest land proposed for non-forestry purpose is furnished below:

Sl. No.	Type of Use	Area in Hectares
1.	Mining Zone	260.769 Ha
2.	OB dump, Embankment, other infrastructure and Blasting danger zone	85.010 Ha
3.	Safety zone	3.930 Ha

3. Identification of Degraded Forest Land

As per revised guidelines contained in letter No.11-30/96-FC, dated 10.04.1997 of the Ministry of Forest & Environmenta special provision for Central Government Projects has been made for compensatory afforestation by inserting Para 3.2 (viii) (inserted) in the existing guideline. As per revised guideline for diversion of Forest Land under the **Forest (Conservation) Act – 1980**, compensatory afforestation can be done over degraded forest land twice in extent of forest area being diverted for Central Projects. As per **clause 4.7** of the consolidated guidelines for diversion of forest land under the **Forest (conservation) Act – 1980** in the matter of mining lease, the forest Area required for safety zone for mining operation should be the part of the forest area proposed for diversion.

Therefore, the present scheme for compensatory afforestation aims at prescribing afforestation program over **712.477 Ha** of degraded forest area (twice in extent to the forest area of **349.709 Ha** including the area of safety zone i.e.,3.930 ha.) being diverted. Accordingly, a gross area of 712.477Ha of degraded forest area has been identified in Satparlia Reserve forest under Sundargarh Forest Division. The identified area of degraded forest in Satparlia Reserve forest is in a single patch. The DGPS map showing the afforestation site in Satparlia R.F is furnished herewith as **Annexure – K.** The degraded forest lands identified having found suitable for afforestation; a certificate to that effect is furnished in **Annexure I**. The compensatory afforestation sites are shown on toposheet enclosed in **AnnexureM.**

4. Topography

The altitude of afforestation site selected in Satparlia varies from 280 to 290 mts. The thickness of soil varies from shallow to moderate. The lateritic soil with moorum is seen in some places and at other it is sandy loamy. The drainage is good. The soil is also devoid of humus. At the site, erosion varies from slight to moderate.

5. Climate

The climate of this region is characterized by hot dry summer with well distributed rainfall in South West monsoon season. Cold seasons begin in the month of November and lasts till the end of February. The hot seasons follows thereafter and continues till June. The South-West monsoon starts from mid-June and continues till the end of September. The annual rainfall varies from 1200 to 1500 mm. The months of October and November constitute the post-monsoon seasons. The climate in general is hot, moist and sub-humid. The temperature varies from 15^0C to 48^0C. May and December are the hottest and the coldest months of the year respectively.

6. Existing Vegetation

Satparlia R.F which is situated approximately 7 km away from Sundargarh is much degraded due to severe biotic interferences and fires. As a result, the forest has been dry and open. The R.F contains bushy forest growth of dry deciduous species namely Karala, Sidha, Dharua, Char, Kendu, Sal, Dhatki, Dumkurdu, Kurdu and Kurai.

7. Proposed Techniques of Afforestation:

The density of forest cover in identified site in Satparlia R.F varies from 0.3 to 0.4. Many gaps are noticed inside the identified site. As the site being degraded with rooted stocks, it is proposed to take up rehabilitation work with regeneration, cleaning of existing crop and gap planting in the blanks. As the soil thickness varies from shallow to medium and the moisture retention capacity of the soil is poor, the pit size is proposed to be 30 x 30 x 30 cubic cm. It is proposed to plant 1000 nos. of seedling of native species at a spacing of 2.5 mt x 2.5 mt. in the gaps. Such ANR works will be taken up over 699.418 Ha out the gross area of 712.477 Ha in Satparlia R.F of Sundargarh Range.

Keeping in view the existing natural vegetation, the edaphic and climatic factors, the following species are chosen to be taken up for plantation:

1. Bamboo- Dendrocalamus strictus

2.Neem - Azadirchta indica

3. Karanj - Pongamia pinnata

4.Amla - Emblica offcinalis

5. Asan - Terminalia tomentosa

6.Jamun - Sizygium cumini

7. Khair - Acacia catechu

8.Bahada - Terminalia chebulla

9.Sissoo - Dalbergia sissoo and others.

(i) Raising of Nursery Stock

Eighteen months old seedlings will be collected from Departmental Central Nursery and dibbled in poly pots for plantation.

- **Following two major operations will be carried out:**

A. Regeneration Cleaning:

This operation will be carried out in winter. Following works will be carried out during this operation:

1. For helping the rooted waste to grow better all the unwanted growth including climber and creepers will be cleaned and removed and the useful species will be freed from suppression.
2. The mal formed stems will be coppiced. When there will be more than one shoot, the sound shoot will be singled out.
3. The congested stands of useful species will also be thinned.
4. Where congested bamboo clumps are available, the same will be cleaned.
5. High stumps will be cut flush to the ground

B. Gap Planting:

For filling up the blanks, 1000 numbers of seedling per Hector is proposed in ANR plantation. The detailed plantation activities & cost has been appended in **Annexure B**.

In the area chosen for plantation work, two stages of weeding are recommended to be carried out. To promote and enhance the growth of the plants, it is necessary to see that, the plants get as much nutrients as possible and that no other plants are competing for space, light and nutrients. Therefore, weeding and soil working must be taken up in a newly created plantation. The period of weeding should be as follows:

(A) 1st weeding and manuring (including casualty replacement) – Last week of July.
(B) 2nd weeding, soil working & manuring – Last week of August/ September

1st weeding is an area weeding and should be taken up after a fortnight of completion of planting. In this weeding, the weeds around the planted seedlings are pulled to a radius of 45 cm and in all other space, they are cut back. During this operation, a dose of NPK fertilizer @ 20 grams per plant will be given to each plant. 2nd weeding is a strip weeding to be taken up in the last week of August/ September. This weeding shall also be carried out along the contour and the cut-out materials will be kept in intermediate lines. In soil, working the soil around each plant is loosened. The soil should be left in clods which will improve soil aeration and help develop root system along with moisture conservation by breaking soil capillary action. The detail plantation cost has been appended in **Annexure B**.

8. Soil Conservation Measures (SCM):

The slope of the area varies from gentle to moderate and at places steep. Soil conservation measures are indispensable and are to be appropriately addressed. The following measures are proposed to be taken:

1. Staggered contour trenches are to be dug in the sloped area of a size 2 m x 50 cm x 50 cm at a contour interval of 5 meter and vertical interval of 2 meter. 2500 m such staggered trenches are proposed to be dug which shall be placed in between the plantation contour lines. This will help in conserving water for planted seedling and checking soil erosion. The earthen bund on the lower side of the trenches is to be stabilized with vegetative plantation.
2. Linear contour bund is to be erected at foot over 2.5 Km.with vegetative plantation on the bund which will retard the velocity of water coming from the upper label to the plains, thereby help in checking soil erosion.
3. Check dams are proposed to be constructed out of dry rubble work in small nallah specially to be given on the upper reaches of the nallah. Twenty-five such dams have been proposed to be taken up.
4. To check soil erosion and the rain water draining out of the area, it has been proposed to take up special conservation measures by digging staggered trenches along the contour over the area @ 200 nos. per Ha. The size of the trenches will be 2 m x 0.5 m x 0.5 m. Digging of staggered

trenches will be done during September of first year. Agave planting will also be taken up on the dugout soil of the trench for its stabilization and to restrict the dugout soil from refilling into the trench. Thus, an amount of **Rs. 7,45,479/-** is required for **31.50Kms.** considering **Rs. 23,666/-per Km.** for carrying out such special Soil & Moisture Conservation Measure. The cost norms for the same is enclosed vide **Annexure-E.**

(i) LOOSE BOULDER STRUCTURE (LBS):

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=40Nos., 2mt = 40 Nos.& 3mt= 24 Nos.)

Name of the Range	**Name of the site**	**Area in Ha.**	**No. of LBS (1 meter in size)**	**No. of LBS (2 meters in size)**	**No. of LBS (3 meters in size)**
Sundargarh Range	Satparlia R.F.	699.418	@Rs.2841/- per LBS For 40 Nos.: **Rs.1,13,640/-**	@ Rs. 5487/- per LBS For 40 Nos.: **Rs.2,19,480/-**	@ Rs. 11346/- per LBS For 24 Nos.: **Rs. 2,72,304/-**

The details of Loose Boulder Structure(LBS) have been appended in **Annexure- D(i), D(ii), D(iii)**

9. Protection

In addition to an above measure, watchers are to be employed on daily wage basis for five years for success of plantation.

10. Miscellaneous operation:

I. Survey and Demarcation: The gross area of the plantation sites in Satparlia R.F must be surveyed and demarcated. It is necessary for future maintenance and management. The area will be surveyed with a prismatic compass and chain. The boundaries of these plots will also act as inspection path and fire line. Masonry pillars would be posted at the boundaries.

II. **Fire lines tracing and management:** Fire is a great destroyer of forest and young shoots. So, the boundaries at the area will be scrapped of any plant growth to a width of 2 meters during February/ March and the cut back materials would be burnt under strict supervision. The inspection path will be scrapped of weak growth to prevent spreading of fire, if any.

III. **Peoples' participation:** The local communities are to be involved in protection work by forming VSS.

IV. **Total financial outlay:** The total outlay for the scheme is **Rs.23,29,60,989.32** (enclosed as **Annexure A**).

V. **Executing Agency:** Divisional Forest Officer, Sundargarh.

Divisional Forest Officer,
Sundargarh Forest Division

Annexure A

TOTAL FINANCIAL OUT LAY OF THE PROJECT

1	ANR Plantation over 699.418 ha. @ Rs.21,15,098.95/per ha.	**Rs.15,04,44,077.41**
2	Barbed wire Fencing	**Rs.2,89,46,090.98**
3	Special Soil Conservation Measure	
	i) Loose Boulder Structure (S.C.M.) Span-1 mt. @Rs.2841/- X 40=Rs. 26,9 0/-	**Rs. 1,13,640.00**
	ii) Loose Boulder Structure (S.C.M.) Span-2 mt. @Rs.5487/- X 40=Rs.53,390/-	**Rs. 2,19,480.00**
	iii) Loose Boulder Structure (S.C.M.) Span-3 mt. @Rs.11346/- X 24=Rs.67188/-	**Rs. 2,72,304.00**
	Total Loose Boulder Structure (S.C.M.)	**Rs. 6,05,424.00**
4	Estimate for digging of staggered trenches along with plantation of agave on the mound	**Rs 9,87,588.00**
5	Providing Cattle proof trench fencing	**Rs.67,58,540.00**
6	Two nos. of watcher sheds	**Rs. 23,11,441.01**
7	Drilling of 10 Nos. of Bore-well and Submersible Pump"	**Rs. 40,80,996.37**
	Total:	**Rs.19,41,34,157.77**
6	Add 20% escalation	Rs. 3,88,26,831.55
	Total:	Rs.23,29,60,989.32
7	Grand Total	**Rs.23,29,60,989.32**

(Rupees Twenty-three Crores twenty-nine lakhs sixty thousand nine hundred eighty-nine and thirty two paisa only).

Divisional Forest Officer
Sundargarh Forest Division

Annexure -B

Cost estimate for Rehabilitation of Degraded Forest

Site:Satparlia R.F.

Area:699.418 Ha

Pit Size:30cm x 30 cm x 30cm,Spacing:2.5 mX 2.5 m,

Plant /Ha: 1000 nos.

Wage Rate: Rs 298/day

Sl. No.	Items of work	Preferable period of execution	Labour in Mandays	Labour Cost	Material Cost	Total Cost
1	**2**	**3**	**4**	**5**	**6**	**7**
Previous Year (Advance Year) Nursery Raising)						
1	Nursery Cost (18 months Old Seedlings)@ Rs. 36.66/- part (Rs 9.17 to be released) for 1100 seedlings (1000+100)	Nov-March	-	-	10087.00	10,087.00
	Total	-	-	-	10087.00	10,087.00
2	Monitoring and Supervision charge @ 5% of the total cost	-	-	-	-	504.35
	Grand Total					**10,591.35**
0thYear (Advance work) Pre-planting operation						
3	Survey, Demarcation and pillar posting	Nov/Dec	2	596.00	0.00	596.00
4	Site Preparation	Nov/Dec	12	3576.00	0.00	3576.00
5	Alignment and stacking of pits	Jan/Feb	2	596.00	0.00	596.00

6	Digging of pits (30 cm cube)	Feb/Mar	40	11920.00	0.00	11920.00
7	Nursery Cost (18 months Old Seedlings)@ Rs. 36.66/- part (Rs 23.83 to be released) for 1100 seedlings (1000+100)	April-Mar	0	0.00	26213.00	26213.00
8	Total	-	-	16688.00	26213.00	42901.00
9	Monitoring and Supervision charge @ 5% of the total cost	-	-	-	-	2145.05
	Grand Total					**45046.05**
1st Year/Planting Year						
10	Nursery Cost (18 months Old Seedlings)@ Rs. 36.66/- part (Rs 3.66 to be released) for 1100 seedlings (1000+100)	April-June	-	-	4026.00	4026.00
11	Fencing for an average of 250 meters/ha @ 76.50/- per meter for bamboo twigs and bamboo thorn fencing	May/June	38	11324.00	19200.00	30524.00
12	Carriage & planting, casualty replacement and application of insecticides, manure, etc.	Jul/Aug	21	6258.00	0.00	6258.00
13	Cost of insecticide and fertilizer					

a)	NPK @ 50 gms/plant as basal dose= 55 kg @Rs. 24 per kg=Rs. 1320	July/August	-	0.00	1320.00	1320.00
b)	Urea @ 70 gms/plant in two subsequent doses @ Rs. 6/kg =Rs. 462	-	-	0.0	462.00	462.00
c)	Granular insecticide (Themet, Forate, etc.)@ 5 gms/plant@ Rs. 80 per kg= Rs. 440	-	-	0.0	440.00	440.00
14	1st weeding	Aug/Sep	7	2086.00	0.00	2086.00
15	Manuring Urea, 35 gms	Aug/Sep	5	1490.00	0.00	1490.00
16	2nd weeding	Sept/Oct	5	1490.00	0.00	1490.00
17	Soil Working (50 cms radius around plants & manuring Urea, 35 gms per plant	Sept/Oct	7	2086.00	0.00	2086.00
18	Soil Conservation Measures in the form of staggered trenches of sizes 2.0 m x 0.5 m x 0.5 m	Sept/Oct	10	2980.00	0.00	2980.00
19	Fire-Line tracing & Inspection path	Feb/March	3	894.00	0.00	894.00
20	Watch & Ward	Aug-March	7	2086.00	0.00	2086.00
	Total			30694.00	25448.00	56142.00
21	Monitoring and Supervision charge @ 5% of the total cost	-	0	0.00	0.00	2807.10
	Grand Total					**58949.10**

2nd Year Maintenance						
22	Repair and maintenance of Bamboo fence including material cost	May/June	20	5960.00	5080.00	11040.00
23	Casualty replacement (10%) with nursery cost	July/August	4	1192.00	3666.00	4858.00
24	Weeding and (complete weeding)	Sept/Oct	6	1788.00	0.00	1788.00
25	Cost of fertilizer (NPK @70gms/plant)(Rs.24/- per kg & insecticide @5 gms/plant for 160 plants 800 gms @ Rs.80/- per Kg)	-	0	0.00	208.00	208.00
26	Soil working (50 Cms. Radius around plants)	Oct/NoV	7	2086.00	0.00	2086.00
27	Application of fertilizer & insecticide	-	4	1192.00	0.00	1192.00
28	Fire line tracing (2 m. wide fire line over 400 m length)	-	3	894.00	0.00	894.00
29	Watch & Ward	-	15	4470.00	0.00	4470.00
	Total	-	-	17582.00	8954.00	26536.00
30	Monitoring & supervision charge 5% of the total cost.	-	-	-	-	1326.8
	Grand Total					**27862.80**
3rdYear Maintenance						

31	Repair and maintenance of Bamboo fence including material cost	May/June	20	5960.00	1000.00	6960.00
32	Weeding and application of fertilizer	Aug/September	7	2086.00	0.00	2086.00
33	Cost of fertiilizer (NPK @ 50 gms/plant) @ Rs.24/-per kg	-	0	0.00	1320.00	1320.00
34	Soil working (50 cms. Radius around plants) & application of fertilizer	Oct/NoV	7	2086.00	0.00	2086.00
35	Fire line tracing (2 m. wide fire line over 400 m length) & cultural operation	Feb/March	3	894.00	0.00	894.00
36	Watch & Ward	April-March	15	4470.00	0.00	4470.00
	Total	-	-	15496.00	2320.00	17816.00
37	Monitoring & supervision charge 5% of the total cost	-	-	-	-	890.80
	Grand Total					**18706.80**
4th Year Maintenance						
38	Fire line tracing (2 m. wide fire line over 400 m length) & cultural operation	Feb/March	3	894.00	0.00	894.00
39	Watch & Ward	April-March	15	4470.00	0.00	4470.00
	Total					5364.00
40	Monitoring & Supervision charge, 5% of the total cost	-	-	-	-	268.20
	Grand Total					**5632.20**

5th Year Maintenance						
38	Fire line tracing (2 m. wide fire line over 400 m length) & cultural operation	Feb/March	3	894.00	0.00	894.00
39	Watch & Ward	April-March	15	4470.00	0.00	4470.00
	Total					5364.00
40	Monitoring & Supervision charge, 5% of the total cost	-	-	-	-	268.20
	Grand Total					**5632.20**
6th Year Maintenance						
38	Fire line tracing (2 m. wide fire line over 400 m length) & cultural operation	Feb/March	3	894.00	0.00	894.00
39	Watch & Ward	April-March	15	4470.00	0.00	4470.00
	Total					5364.00
40	Monitoring & Supervision charge, 5% of the total cost	-	-	-	-	268.20
	Grand Total					**5632.20**
7thYear Maintenance						
38	Fire line tracing (2 m. wide fire line over 400 m length) & cultural operation	Feb/March	3	894.00	0.00	894.00
39	Watch & Ward	April-March	15	4470.00	0.00	4470.00
	Total					5364.00
40	Monitoring & Supervision charge, 5% of the total cost	-	-	-	-	268.20
	Grand Total					**5632.20**
8thYear Maintenance						

38	Fire line tracing (2 m. wide fire line over 400 m length) & cultural operation	Feb/March	3	894.00	0.00	894.00
39	Watch & Ward	April-March	15	4470.00	0.00	4470.00
	Total					5364.00
40	Monitoring & Supervision charge, 5% of the total cost	-	-	-	-	268.20
	Grand Total					**5632.20**
9th Year Maintenance						
38	Fire line tracing (2 m. wide fire line over 400 m length) & cultural operation	Feb/March	3	894.00	0.00	894.00
39	Watch & Ward	April-March	15	4470.00	0.00	4470.00
	Total					5364.00
40	Monitoring & Supervision charge, 5% of the total cost	-	-	-	-	268.20
	Grand Total					**5632.20**
10th Year Maintenance						
38	Fire line tracing (2 m. wide fire line over 400 m length) & cultural operation	Feb/March	3	894.00	0.00	894.00
39	Watch & Ward	April-March	15	4470.00	0.00	4470.00
	Total					5364.00
40	Monitoring & Supervision charge, 5% of the total cost	-	-	-	-	268.20
	Grand Total					5632.20
	Total of all expenses					**200581.50**

ABSTRACT

Year	Total
Previous year	10591.35
0th Year	45046.05
1stYear	58949.10
2ndYear	27862.80
3rdYear	18706.80
4th Year	5632.20
5th Year	5632.20
6th Year	5632.20
7th Year	5632.20
8th Year	5632.20
9th Year	5632.20
10th Year	5632.20
Total	**200581.50**

Additional incentive of 3% for VSS/Fr/FG proposed for more than 80% survival and good growth during 4th year of the maintenance as per recommendation of DFO and RCCF: **Rs. 6017.45**

Additional EPA expenses if implemented through VSS: **Rs: 8500.00**

0th year	Rs: 1000.00
1st year	Rs: 2000.00
2nd year	Rs: 1500.00
3rd year	Rs: 500.00
4th year	Rs: 500.00
5th year	Rs: 500.00
6th year	Rs: 500.00
7th year	Rs. 500.00
8th year	Rs. 500.00
9th year	Rs. 500.00
10th year	Rs. 500.00

Total:	**Rs: 8500.00**

Cost of plantation: (Rs. 200581.50.00 + Rs. 6017.45+ Rs. 8,500)=**Rs. 21,50,98.95/Ha**

Total Cost for Plantation: 699.418 Ha x Rs21,50,98.95/Ha = Rs. 15,04,44,077.41or Rs. 15,04,44,077.41 /-

(RupeesFifteen Crore four lakhs forty-four thousand seventy-seven and forty-one paisa).

Annexure -C

Estimate for Barbed Wire Fencing

1. Requirement of barbed wire per km as per Plantation cost norms 2019, Annexure 37: 1912 kg @ Rs. 80/kg

   Therefore, total cost of barbed wire per km: Rs. (1912 x 80) = Rs. 1,52,960.00

   Now, the total cost of barbed wire per km for 31.50 km = Rs. (31.50 x 1,52,960.00) = **Rs. 48,18,240.00**

2. Construction of RCC pillars

   As per plantation cost norms 2019, Annexure 37, the cost of one pillar is Rs. 644.00

   Requirement of pillars per km:

   Spacing 2.5 mt x 2.5 mt

   Requirement= 1000 mt/2.5 mt = 400 numbers

   Strut pillar in every 10^{th} pillar = (400/10) x 2 = 80

   Therefore, total number of pillars per km = 480 numbers

   Cost of pillars per km: Rs. 644.00 x 480 numbers = Rs. 3,09,120.00

   Total number of pillars in 31.50 km: 15,120

   Cost of pillars for 31.50 km: Rs. 644 x 15120 = **Rs. 97,37,280.00**

3. Fitting fixing of RCC pillars in position with hbg metal (4cm) in C.M. (1:4:8)

i) Digging of pits 1.5' x 1.5' x 1.5 '= 3.375 cft/pit

For 480 pits, 480 pits x 3.375 cft/pit =1620 cft or 45.86 cum @ Rs. 12,040.00/100cum =Rs. 5521.54

For 15120, total digging to be done: 51,030.00 cft or 1445.00 cum

Hence, cost for digging of pits in 31.50 km of total length: 1445.00 cum x Rs. 5521.52 = **Rs. 79,78,596.40**

ii) Fixing of pillars with 4cm hbg metals in C.M. 1:4:8

Total C.C. work per pillar: 2.25 cft

For 480 pillars: 480 x 2.25 = 1080 cft or 30.577 cum @ Rs. 3629.46/cum

For 15120 pillars, 15120 x 2.25 = 34,020 cft or 963.34 cum

Therefore, total cost for fixing of pillars with 4cm hbg metals in C.M. 1:4:8: 963.34 cum. x Rs. 3629.46 = **Rs. 34,96,404.00**

4. Labor for straightening the barbed wire and fixing & clipping with pillars, 70 M.D. per km @ 298/-: Rs. 298 x 70 = Rs. 20,860.00

   Therefore, for 31.50 km, total cost = Rs. 20,860.00 x 31.50 = **Rs. 6,57,090.00**

5. Carriage of barbed wire & pillars to work site @ Rs.1000/tl. and cost of loading & unloading within 5 km distance approximately 10 tld @ 800/tld = Rs.18,000

   Therefore, for 31.50 km,

   total cost = (31.50/5) x Rs. 18,000.00 = **Rs. 1,13,400.00**

6. Provision of one Iron Gate of size (4' x 5') on LS = Rs. 7,500.00

   Therefore for 31.50 km, total cost of providing Iron Gate: Rs. 7,500 x 31.50 = **Rs. 2,36,250.00**

   Total Expenditure: Rs. 2,70,37,260.40

   Labor cess @ 1%: 270372.60

   Total Expenditure including labor cess**: Rs. 2,73,07,633.00**

7. Expenditure towards maintenance for 3 years (3^{rd}, 6^{th}, and 9^{th} year)

   @ 2% of cost = 3 x 0.02 x Rs. 2,73,07,633.00 =**Rs. 16,38,457.98**

   Grand Total: Rs. 2,89,46,090.98

ANNEXURE – D(i)

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

Description of Work	**Unit and Volume**	**Price**
Leveling the unshaped surface of the selected site & layout the structure foundation L.S. 1 MD.		**Rs. 298.00**
Excavation of foundation in hard soil within initial lead of 50 meters 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 =1.728 cum Wing wall – 4 x 0.50 x 0.30 x 0.30=0.180 cum **@ Rs. 6667.20 per 100 cum.**	1.908 cum	**Rs. 127.00**
Rough stone dry packing up to GL Base with apron – 1 x 3.60 x 1.60 x 0.30= 1.728 cum Wing wall – 4 x 0.50 x 0.30 x 0.30= 0.180 cum Above GL Super structure- 1 x 1.00 x $\frac{2.60 + 0.50}{2}$ x 0.60 = 0.930 cm. Wing wall – 4 x 0.50 x 0.30 x 0.30 = 0.180 cum. Side wall- i. 2 x $\frac{0.3+0.9}{2}$ x 0.3 = 0.324cum. ii. 2 x 0.3 + $\frac{0.9 \times 1.2}{2}$ x 0.3 = 0.432cum. iii. 2 x 0.5 x 0.9 x 0.3 = 0.270 cum. iv. 2 x 1.0 x 0.3 x 0.3 = 0.180 cum. **@Rs. 571.87 per cum.**	**4.224 cum**	**Rs. 2,416.00**
G. Total Rs. 2,841.00 **(Rupees Two Thousand Eight hundred forty-one only)**		

ANNEXURE – D(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. 298.00**
2. Excavation of foundation in hard soil within initial lead of 50 meter. 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. 6667.20 per 100 cum.**	3.33 0.30 3.63 cum	**Rs. 242.00**
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. 571.87 per cum**	3.33 0.30 1.98 0.50 0.72 0.96 0.36 0.50 **8.65 cum**	**Rs. 4,947.00**
G. Total:		**Rs. 5,487.00**
(Rupees Five thousand four hundred eighty-seven only)		

ANNEXURE –D(iii)

II. 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

I. Leveling the unshaped surface of the selected site & layout the structure foundation L.S. 1 MD.		**Rs.298.00**
II. 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 = 6.12 cum. Wing wall – 4 x 0.50 x 0.50 x 0.30 = 0.30 cum. **@ Rs. 6667.20 per 100 cum.**	6.42 cum.	**Rs. 428.00**
III. 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- 2 x $\frac{0.50+1.50}{2}$ x 1.5 x 0.5 = 2 x $\frac{0.5 +1.50}{2}$ x 2.0 x 0.5 = . 2 x 0.6 x 1.0 x 0.5 = . 2 x 1.0 x 0.5 x 0.5 = Total: **@ Rs. 571.87 per cum**	6.12 0.30 7.05 0.50 1.50 2.00 0.60 0.50 **18.57 cum.**	**Rs.10620.00**
Grand Total: Rs. 11346.00 **(Rupees Eleven thousand three hundred forty-six only)**		

Annexure-E

Estimate for digging of staggered trenches along with plantation of agave on the mound

- **Digging of Staggered Trenches:**

- Earth work in ordinary soil of staggered trenches of size 2 mt x 0.5 mt x 0.5 mt:

  Male Labor, 16 numbers @ Rs. 298 per MD = Rs, 4768.00

  Female Labor, 16 numbers @ Rs. 298 per MD = Rs, 4768.00

  Total: **Rs. 9536.00/100 cum.**

  Size of Staggered Trench: 2.0 mt x 0.5 mt x 0.5 mt = 0.5 m^3

  For 100 cum, earth work required = Rs. 9536.00

  For 0.5 cum, earth work required = Rs. (9536 x 0.5)/100 = Rs. 47.68

  Therefore, for 200 numbers of staggered trenches/km,

  Total cost = Rs. 47.68 x 200 = **Rs. 9536.00**

- Cost of Agave Planting on the dugout soil and its maintenance including weeding, soil working, manuring, cost of fertilizer etc., for Seven years.:

03 nos. of average plants per trench @ Rs. 36.66 per plant = Rs. **109.98**

Therefore, for 200 numbers of staggered trenches,

the total cost of agave planting: 104.52 x 200 = **Rs. 21816.00**

- Total = Rs. 9536.00 + 20,904.00 = Rs. 31,352.00 for 200 numbers of staggered trenches/km

Therefore, for 31.50 km, Rs. 31,352.00 x 31.50 = Rs. 9,87,588.00

- Thus, the total cost for digging of staggered trenches along with plantation of agave on the mound is **Rs. 9,87,588.00**

- Prepared on the basis of Plantation cost norms **"Annexure-41".**

Annexure F

Cattle Proof Trench Fencing

- **Specifications:**

Length: 1.0 meter

Top Width: 2.0 meter

Bottom width: 1.0 meter

Depth: 1.5 meter

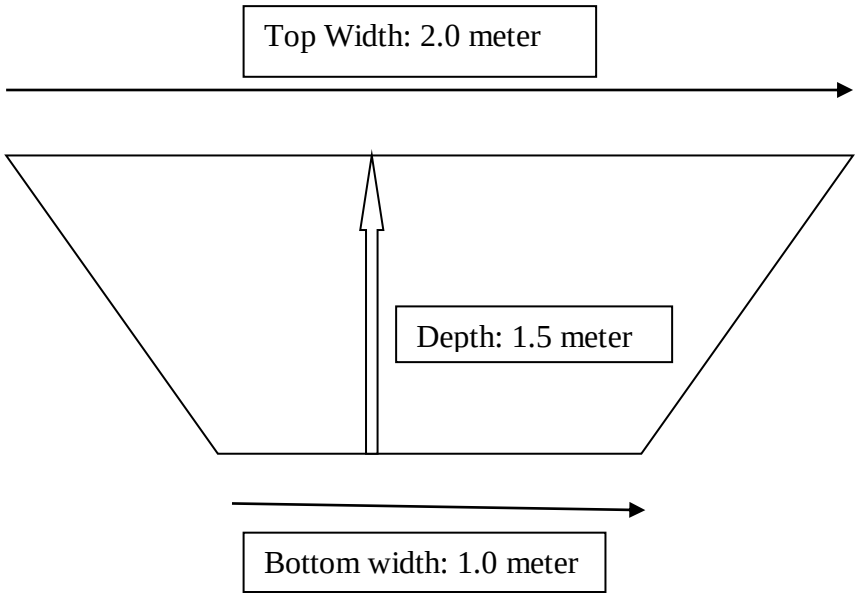
Cross Section: [(2.0 meter+1.0 meter)/2 x 1.5meter] = 2.25 m^2

Earth Work: (1.0meter x 2.25 m^2) = 2.25 m^3

Cost per 1 running meter= 0.72 MD = Rs. 214.56 (@ **Rs. 298**/Wage MD Rate)

Cost for **31,500** running meters = Rs. (31,500 x 214.56) = **Rs. 67,58,540.00**

[Prepared as per Plantation Cost Norms 2019]



Annexure G

ESTIMATE						
Name of the work:Two nos.of watcher sheds						
	ABSTRACT OF COST				**EST. NO.**	
Sl. No.	Description of items.	Quantity	Unit	Rate	Amount.	**Reference: MCL Updated Rates'Nov'2018**
1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5 m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil.	20.66	cum	169.00	3491.54	2.8.1
2	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level: 1:4:8 (1 Cement : 4 coarse sand : 8 graded stone aggregate 40 mm nominal size).	10.57	cum	3953.50	41788.50	4.1.8

3	Supplying and filling in plinth with Jamuna sand under floors, including watering, ramming, consolidating and dressing complete.	10.57	cum	722.55	7637.35	2.27
4	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size).	7.98	cum	5529.00	44121.42	5.1.2
5	Reinforced cement concrete work in walls (any thickness), including attached pilasters, buttresses, plinth and string courses, fillets, columns, pillars, piers, abutments, posts and struts etc. up to floor five level, excluding cost of centering, shuttering, finishing and reinforcement: 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size).	1.48	cum	6472.65	9579.52	5.2.2

6	Reinforced cement concrete work in beams, suspended floors, roofs having slope upto15degree, landings, balconies, shelves, chajjas, lintels, bands,plain window sills, staircases and spiral staircases upto floor five level excluding the cost of centering, shuttering, finishing & reinforcement with 1:1.5:3(1cement:1.5coarse sand:3 grded stoneaggregate 20mm nominal size).	12.64	cum	6728.30	85045.71	Derived rate of 5.3 (modified)
7	Brick work with Fly Ash Brick (230x125x75 mm size) bricks of class designation 10 in foundation and plinth in: Cement mortar 1:6 (1 cement : 6 coarse sand).	4.73	cum	4262.65	20162.33	Derived rate of 6.1.2
8	Brick work with Fly Ash Brick (230x125x75 mm size) bricks of class designation 10 in superstructure above plinth level up to floor V level in all shapes and sizes in : Cement mortar 1:6 (1 cement : 6 coarse sand).	20.85	cum	5128.80	106935.48	Derived rate of 6.4.2

9	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars.	2424.40	kilogram	74.15	179769.26	5.22.6
10	12 mm cement plaster of mix : 1:6 (1 cement: 6 fine sand).	243.43	sqm	163.80	39873.83	13.1.2
11	12 mm cement plaster finished with a floating coat of neat cement of mix : 1:4 (1 cement: 4 fine sand).	14.86	sqm	218.40	3245.42	13.7.2
12	6 mm cement plaster of mix : 1:3 (1 cement : 3 fine sand).	57.11	sqm	148.15	8460.85	13.16.1
13	Cement concrete flooring 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate) finished with a floating coat of neat cement, including cement slurry, but excluding the cost of nosing of steps etc. complete.40 mm thick with 20 mm nominal size stone aggregate.	52.77	sqm	344.20	18163.43	11.3.1
14	Distempering with oil bound washable distemper of approved brand and manufacture to give an even	195.25	sqm	108.90	21262.73	13.41.1

	shade : New work (two or more coats) over and including water thinnable priming coat with cement primer.					
15	Finishing walls with Acrylic Smooth exterior paint of required shade : New work (Two or more coat applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm).	127.93	sqm	114.20	14609.61	13.46.1
16	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	660.20	kg	89.00	58757.80	10.2
17	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade : Two or more coats on new work.	39.62	sqm	82.30	3260.73	13.61.1
18	Centering and shuttering including strutting, propping etc. and removal of form for: Foundations, footings, bases of columns, etc. for mass concrete.	9.60	sqm	199.95	1919.52	5.9.1

19	Centering and shuttering including strutting, propping etc. and removal of form for: Suspended floors, roofs, landings, balconies and access platform.	65.84	sqm	479.10	31543.94	5.9.3
20	Centering and shuttering including strutting, propping etc. and removal of form for: Columns, Pillars, Piers, Abutments, Posts and Struts.	24.32	sqm	539.15	13112.13	5.9.6
21	Centering and shuttering including strutting, propping etc. and removal of form for: Lintels, beams, plinth beams, girders, bressumers and cantilevers.	56.05	sqm	387.20	21702.56	5.9.5
22	Centering and shuttering including strutting, propping etc. and removal of form for: Weather shade, Chajjas, corbels etc., including edges.	5.60	sqm	819.10	4586.96	5.9.19
23	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:1½:3 (1 Cement: 1½ coarse sand: 3 graded stone aggregate 20 mm nominal size).	0.49	cum	5220.70	2558.14	4.1.2

24	Providing and fixing Stainless Steel A ISI 304 (18/8) kitchen sink as per IS: 13983 with C.I. brackets and stainless steel plug 40 mm, including painting of fittings and brackets, cutting and making good the walls wherever required: Kitchen sink without drain board :610x460 mm bowl depth 200 mm.	1.00	each	4508.10	4508.10	4.1.3
	Total for 01 no.				746096.86	
	Total cost for 02 no.				1492193.72	
	Add GST@18%:				268594.87	
	Total in Rs.				**1760788.59**	

ESTIMATE

Part-B(Construction of the toilets)

Sl. No.	**Description of items.**	**Quantity**	**Unit**	**Rate**	**Amount.**	**Reference: MCL Updated Rates'Nov'2018**
1	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan), including dressing of sides and ramming of bottoms, lift upto 1.5	15.39	cum	169.00	2600.91	2.8.1

	m, including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. All kinds of soil. cum 169.00					
2	Supplying and filling in plinth with river sand under floors, including watering, ramming, consolidating and dressing complete. cum 722.55	2.44	cum	722.55	1763.02	2.27
3	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level :1:3:6 (1 Cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) cum 4255.20	2.44	cum	4255.20	10382.69	4.1.6
4	Brick work with Fly Ash Brick (230x125x75 mm size) bricks of class designation 10 in foundation and plinth in: Cement mortar 1:6 (1 cement : 6 coarse sand).	11.31	cum	4262.65	48210.57	Derived rate of 6.1.2
5	Providing and laying in position specified grade of reinforced cement concrete, excluding the cost of	1.31	cum	5529.00	7242.99	5.1.2

	centering, shuttering, finishing and reinforcement - All work up to plinth level : 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size).					
6	Reinforced cement concrete work in beams, suspended floors, roofs having slope up to 15° landings, balconies, shelves, chajjas, lintels, bands, plain window sills, staircases and spiral stair cases up to floor five level, excluding the cost of centering, shuttering, finishing and reinforcement, with 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size).	0.24	cum	6346.50	1523.16	5.3
7	Steel reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete upto plinth level. Thermo-Mechanically Treated bars kilogram 74.15	202.40	kilogram	74.15	15007.96	5.22.6

8	Reinforced cement concrete work in beams, suspended floors, roofs having slope upto15degree, landings, balconies, shelves, chajjas, lintels, bands,plain window sills, staircases and spiral staircases upto floor five level excluding the cost of centering, shuttering, finishing & reinforcement with 1:1.5:3(1cement:1.5coarse sand:3 grded stoneaggregate 20mm nominal size). cum 6728.3	0.98	cum	6728.30	6593.73	Derived rate of 5.3
9	Centering and shuttering including strutting, propping etc. and removal of form for: Suspended floors, roofs, landings, balconies and access platform sqm 479.10	13.26	sqm	479.10	6352.87	5.9.3
10	Centering and shuttering including strutting, propping etc. and removal of form for: Lintels, beams, plinth beams, girders, bressumers and cantilevers.	9.34	sqm	387.20	3616.45	5.9.5
11	Brick work with Fly Ash Brick (230x125x75 mm size) bricks of class designation 10 in superstructure	6.29	cum	5128.80	32260.15	Derived rate of 6.4.2

	above plinth level up to floor V level in all shapes and sizes in : Cement mortar 1:6 (1 cement : 6 coarse sand).					
12	Structural steel work riveted, bolted or welded in built up sections, trusses and framed work, including cutting, hoisting, fixing in position and applying a priming coat of approved steel primer all complete.	185.51	kg	89.00	16510.39	10.2
13	12 mm cement plaster of mix : 1:6 (1 cement: 6 coarse sand).	54.84	sqm	163.80	8982.79	13.4.2
14	Cement concrete flooring 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate) finished with a floating coat of neat cement, including cement slurry, but excluding the cost of nosing of steps etc. complete. 40 mm thick with 20 mm nominal size stone aggregate.	5.75	sqm	344.20	1979.15	11.3.1
15	12 mm cement plaster finished with a floating coat of neat cement of mix : 1:4 (1 cement: 4 fine sand).	16.54	sqm	218.40	3612.34	13.7.2

16	Providing and fixing water closet squatting pan (Indian type W.C. pan) with 100 mm sand cast Iron P or S trap, 10 litre low level white P.V.C. flushing cistern, including flush pipe, with manually controlled device (handle lever) conforming to IS : 7231, with all fittings and fixtures complete, including cutting and making good the walls and floors wherever required: White Vitreous china Orissa pattern W.C. pan of size 580x440 mm with integral type foot rests.	1.00	each	5512.90	5512.90	17.1.1
17	Providing and fixing wash basin with C.I. brackets, 15 mm C.P. brass pillar taps, 32 mm C.P. brass waste of standard pattern, including painting of fittings and brackets, cutting and making good the walls wherever require: White Vitreous China Flat back wash basin size 550x 400 mm with single 15 mm C.P. brass pillar tap.	1.00	each	3236.05	3236.05	17.7.4

18	Providing and fixing 600x450 mm beveled edge mirror of superior glass (of approved quality) complete with 6 mm thick hard board ground fixed to wooden cleats with C.P. brass screws and washers complete.	2.00	each	1357.90	2715.80	17.31
19	Providing and fixing P.V.C. waste pipe for sink or wash basin including P.V.C. waste fittings complete. Semi rigid pipe :32 mm dia.	1.00	each	159.70	159.70	17.28.1.1
20	Providing and fixing PTMT towel rail complete with brackets fixed to wooden cleats with CP brass screws with concealed fittings arrangement of approved quality and colour. 450 mm long towel rail with total length of 495 mm, 78 mm wide and effective height of 88 mm, weighing not less than 170 gms.	1.00	each	543.00	543.00	17.73.1
21	Providing and fixing on wall face unplasticised Rigid PVC rain water pipes conforming to IS: 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10	18.00	metre	507.75	9139.50	12.41.2

	mm gap for thermal expansion, (i) Single socketed pipes110 mm diameter metre.					
22	Providing and fixing on wall face unplasticised - PVC moulded fittings/ accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion.Single tee without door :110x110x110 mm.	2.00	each	258.85	517.70	12.42.4.2
23	Providing and fixing unplasticised - PVC pipe clips of approved design to unplasticised - PVC rain water pipes by means of 50x50x50 mm hard wood plugs, screwed with M.S. screws of required length, including cutting brick work and fixing in cement mortar 1:4 (1 cement : 4 coarse sand) and making good the wall etc. complete. 110 mm.	4.00	each	216.85	867.40	12.43.2

24	Providing and fixing on wall face unplasticised - PVC moulded fittings/ accessories for unplasticised Rigid PVC rain water pipes conforming to IS : 13592 Type A, including jointing with seal ring conforming to IS : 5382, leaving 10 mm gap for thermal expansion. Bend 87.5° :110 mm bend.	2.00	each	191.30	382.60	12.42.5.2
25	Constructing soak pit 1.20x1.20x1.20 m filled with brickbats including S.W. drain pipe 100 mm diameter and 1.20 m long complete as per standard design.	1.00	each	4164.95	4164.95	Derived rate of 19.33
26	Providing and laying in position cement concrete of specified grade excluding the cost of centering and shuttering - All work up to plinth level : 1:1½:3 (1 Cement: 1½ coarse sand: 3 graded stone aggregate 20 mm nominal size).	0.26	cum	5220.70	1357.38	4.1.2
27	Finishing walls with Acrylic Smooth exterior paint of required shade : New work (Two or more coat applied @	54.84	sqm	114.20	6262.73	13.46.1

	1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/10 sqm).					
28	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade : Two or more coats on new work.	12.42	sqm	82.30	1022.17	13.61.1
29	Making connection of G.I. distribution branch with G.I. main of following sizes by providing and fixing tee, including cutting and threading the pipe etc. complete : 25 to 40 mm nominal bore.	1.00	each	460.25	460.25	18.13.1
30	Providing and fixing gun metal gate valve with C.I. wheel of approved quality (screwed end) : 25 mm nominal bore.	2.00	each	965.20	1930.40	18.17.1
31	Providing and placing on terrace (at all floor levels) polyethylene water storage tank, ISI : 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base	2000.00	per litre	8.75	17500.00	18.48

	support for tank.					
32	Providing and fixing G.I. Union in existing G.I. pipe line, cutting and threading the pipe and making long screws, including excavation, refilling the earth or cutting of wall and making good the same complete wherever required : 25 mm nominal bore.	2.00	each	469.00	938.00	18.47.3
33	Providing and fixing G.I. pipes complete with G.I. fittings and clamps, i/c cutting and making good the walls etc. Internal work - Exposed on wall :20 mm dia nominal bore.	30.00	metre	302.80	9084.00	18.10.2
34	Providing and fixing PTMT stop cock of approved quality and colour.15 mm nominal bore, 86 mm long, weighing not less than 88 gms.	2.00	each	197.10	394.20	18.55.1
35	Providing and fixing PTMT bib cock of approved quality and colour. 15mm nominal bore, 86 mm long, weighing not less than 88 gms.	2.00	each	185.50	371.00	18.54.1
36	Providing and fixing plasticized PVC	2.00	each	64.20	128.40	18.21.2.1

	connection pipe with brass unions: 45 cm length:15 mm nominal bore.					
					233327.30	
			GST	18%	41998.91	
				TOTAL	275326.21	
		For 2 Nos.	Toilet		550652.42	
	Grand Total: (Part A + Part B)				**23,11,441.01**	

AnnexureH

Estimate for the work "Drilling of 10 Nos. of Bore-well and Submersible Pump"						
Enclosed: Quotation Ref. letter Dated. 25.07.18						
Sl.No.	**Code**	**Description**	**Qty.**	**Unit**	**Rate**	**Amount**
1		Labor for drilling perfectly vertical bore hole of a specified dia. for a specified depth below around level through consolidated and unconsolidated rock with combination drilling rig as required to suit the side condition as per the direction of Engineer-in-charge including supply of rig with its accessories T&P and consumables etc forlowering or 200mmx150mm dia. GI/PVC/CMS pipes for housing fitted with socket and with or without well hard and boulder formation GI/PVC/CMS casing pipe if required to prevent collapse of over burden is to be provided by completion of tube wall).				
1.1	A	A. Drilling of 200mm dia bore-0 mtr to 30.00mtr.	30.00	per mtr	500.00	15000.00
1.2	B	B. Drilling of 200mm dia bore-30 mtr to 60.00 mtr	30.00	per mtr	500.00	15000.00
1.3	C	C. Drilling of 150 mm dia bore-60 mtr to 230.00 mtr and below	170.00	per mtr	450.00	76500.00

2		Lowering the following size of GI/PVC/MS/housing pipe with or without slotted pipes as per the necessary from the ground level upto 45.00 mtrs. Depth and fixed up in perfectly vertical position including cutting and threading of pipes and materials T&P all completed and the top of casing pipe threaded including plugging tube wells to prevent entry of foreign materials. lowering of 200mm dia PVC casing from 0.00 to 30mtrs lowering of 200mm dia PVC casing beyond 30mtrs and upto 60.00 mtrs.	60.00	per mtr	110.00	6600.00
3		Cleaning and developing tube-well with their own compressor continuously worked till clear and adequate discharge is obtained from tube-well including supply and use of all necessary equipment and labor as per direction of the EIC.	1.00	per mtr	3500.00	3500.00
4		Supplying all materials and labour,T&P and providing sanitary sealing by cement concrete grouting of annual space around GI/PVC/MS housing pipe upto 5.00 mtrs below ground level as per drawing to plug the above hole excluding cost of cement all complete as per the direction of EIC. Minimum one mtr of casing pipe to be inserted in the bare into the truck at the bottom	1.00	Each	1200.00	1200.00
5	A	Supplying of casing pipe 7" (200mm) PVC pipe.	60.00	per mtr	1430.00	85800.00

6	B	Providing and fixing clamp fabrication 65x1x1000mm for supporting clamp.	1.00	pair	690.00	690.00
7	C	Providing and fixing M.S. cap heavy duty for 100mm dia pipe.	1.00	pair	630.00	630.00
8	D	Providing and fixing M.S. cap heavy duty for 100mm dia pipe.	1.00	Each	810.00	810.00
9		Providing erecting and giving test of 2 HP submersible pump set confirming to IS 8034 and motor confirming to IS 9283 with water proof winding.Pump shall be suitable for various delivery head and discharge with stainless steel shaft.Motor suitable for working on 115/109 single phase,50Hz A.C. supply with cable guard, thrust carbon/fibre bearing to withstand entire hydraulic thrust.The pump set shall be suitable for direct coupling with suitable starter.Pump should have suitable discharge outlet as per manufacture's design.Anti-thrust streamlined nonreturn valve should be provided with the pump 3meter submersible copper conductor cable in single double run and 2 pair at erection clamp 65mm width 10mm thick shall be provided with each pump. The rate should be inclusive of lowering of 50mm dia. delivery pipe. Submersible pump set shall be operated for seven days run aftercommissioning and shall	1.00	Each	15787.15	15787.15

		carry manufacture's guarantee for a minimum period of one year.				
10.00		IS mark GI pipe heavy class and 50mm including al local and central taxes,inspection charges,transportation to stores etc., complete. NOTE: One coupler shall be provided with full length pipe cost of which is including in rates below.	200.00	Mtr.	380.00	76000.00
11		Supply and erecting B class GI Bend in position with necessary material 50mm diameter.	4.00	Each	230.00	920.00
12		Supplying and erecting Heavy duty GI Union in position with necessary material 50mm diameter.	2.00	Each	280.00	560.00
13		Supplying and erection automatic control panel for centrifugal/5HPsubmersible pump set consisting of starter S.P.P. water level controller,armeter phase indicating lamp etc., way for UG Tank.	1.00	Each	10500.00	10500.00
14		Supplying erecting flat flexible submersible cable copper conduct or PVC insulated and PVC sheather PVC installed PVC sheather copper conductor submersible cable 3 core 6 sqm	170.00	per mtr	210.00	35700.00
15		Supplying and erecting iron clad switch & fuse unit 415 500 V 32 Amp approved make erected on angle iron same.	1.00	Each	650.00	650.00
		TOTAL for 01 no.		Rs.	=	345847.15
		TOTAL for 10 no.		Rs.	=	3458471.50

		GST 18%		Rs.	=	622524.87
		GRAND TOTAL		**Rs.**	**=**	**40,80,996.37**

SUITABILITY CERTIFICATE

Certified that 712.477 Ha. of Degraded Reserve Forest Land identified in Satparlia RF of Sundargarh Range of Sundargarh Forest Division in Sundargarh District is suitable for the purpose of Compensatory Afforestation in ANR model @ 1,000 plants per Ha. in lieu of Forest Land over 349.709 Ha. to be diverted for Coal Mining in Siarmal OCP of M/s Mahanadi Coalfields Ltd.

Divisional Forest Officer,
Sundargarh Forest Division.

महानदी कोलफील्डस लिमिटेड
Mahanadi Coalfields Limited
(A subsidiary of Coal India Limited)

OFFICE OF THE GENERAL MANAGER
MAHALAXMI AREA
At/P.O.: Basundhara, Dist: Sundargarh
(Odisha), Pin Code No.770076
Tel. No. 06621-286129
E-mail: mcl.mahalaxmi2019@gmail.com

Ref. No.: MCL/GM/MLA/2020/ 742 **Date:** 16.10.2020

UNDERTAKING

I do hereby, undertake to pay the cost of compensatory afforestation & any cost escalation thereof in implementation of this compensatory afforestation scheme. Again, I do undertake to implement the fixing and posting of pillars in the degraded forest area identified for afforestation scheme, fencing of other areas under the scheme as per guidelines of Forest Department. I also hereby undertake to pay the NPV as well as the additional Net Present Value (NPV) of the forest land involved.

General Manager
Mahalaxmi Area
Mahanadi Coal Fields Limited

16/10/20
Project Officer
Siarmal O.C.P.

Project Officer,
Siarmal OCP,
Mahalaxmi Area.

Letter Pad

Revised-Final Summary of Land Schedule for all Mining Village under Siarmal OCP, Siarmal Area , MCL

Fig. in Acre./Ha.

Sl. No.	Village	Mining				Embankment For Siarmal,Gopalpur ,Ratansara OB Dump & Infrstrure for Jhupurunga & Tumulia				Safety Zone				Blasting Zone				Total				
		Forest	GNF	Tenancy	Total	Forest	GNF	Tenancy	Total	Forest	GNF	Tenancy	Total	Forest	GNF	Tenancy	Total	Forest	GNF	Tenancy	Total in AC.	Total in HA.
						Embankment																
1	Siarmal	170.15	97.62	194.17	461.94	26.04	7.73	11.42	45.19	1.48	0.23	1.81	3.52				0.00	197.67	105.58	207.40	510.65	206.66
2	Gopalpur	194.23	260.33	947.26	1401.82	34.97	19.63	3.65	58.25	3.52	2.21	0.84	6.57				0.00	232.72	282.17	951.75	1466.64	593.54
3	Ratansara	118.45	121.01	296.74	536.20	1.01	10.60	53.93	65.54	0.31	1.33	2.49	4.13				0.00	119.77	132.94	353.16	605.87	245.19
4	Kulda	7.70	0.05	1.10	8.85	14.75	18.75	24.26	57.76	0.18	0.03	0.11	0.32					22.63	18.83	25.47	66.93	27.09
						OB Dump																
5	Jhupurunga	8.23	189.97	787.56	985.76	109.90	167.18	490.75	767.83	14.24	2.79	8.43	25.46	0.60	13.18	54.94	68.72	132.97	373.12	1341.68	1847.77	747.78
6	Tumulia	145.60	81.10	305.50	532.20	10.31	85.47	380.26	476.04	0.79	29.15	107.02	136.96	1.67	0.73	14.24	16.64	158.37	196.45	807.02	1161.84	470.19
Total in AC.		644.36	750.08	2332.33	3926.77	182.23	299.61	949.01	1412.85	20.52	35.74	120.7	176.96	2.27	13.91	69.18	85.36	864.12	1109.09	3686.48	5659.7	
Total in HA.		260.769	303.553	1024.826	1589.142	73.747	117.608	383.417	571.773	8.304	14.464	48.847	71.615	0.919	5.629	27.987	34.545	349.709	448.843	1491.898	2290.449	

Project Officer
Siarmal OCP

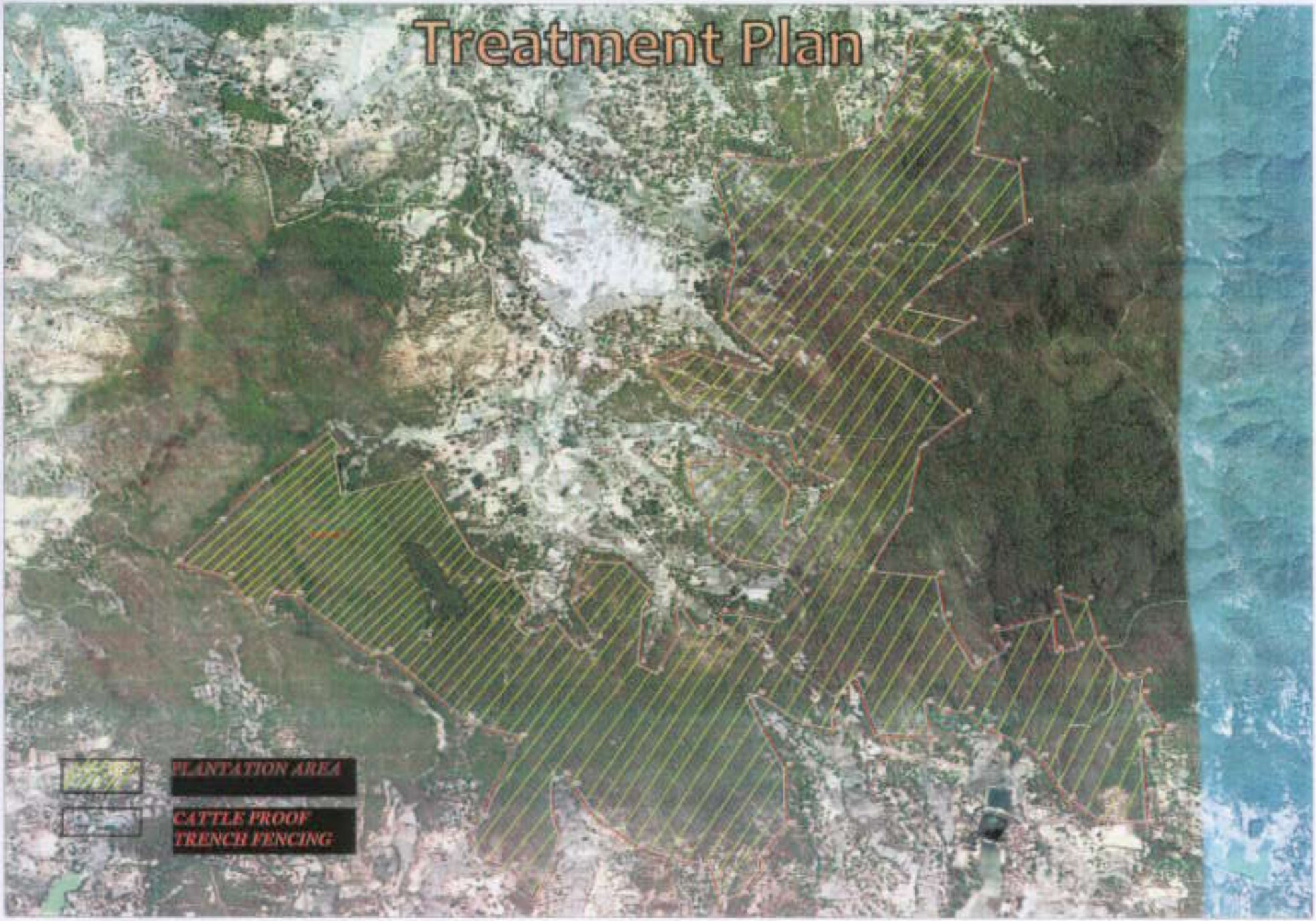
Asst. Revenue Inspector
Siarmal OCP

"Certified that status of total land involved in the Project (both forest and non-forest) as given in the table above is as per Government records as on 25.10.1980".

Verified by me
Forest Keeper

Tahsildar, Hemgir
Sundargarh

Project Officer
Siarmal OCP.


Treatment Plan
PLANTATION AREA
CATTLE PROOF
TRENCH FENCING