

Telesonic Networks Ltd.
3rd Floor, Metro Towers, Near
Vijay Nagar Square Scheme
No-54, Indore-452010.

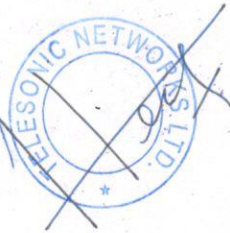
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DGPS Survey Report for Forest Diversion of Proposed OFC
Cable routes in Kawardha Forest Division with Route Length
12.934 Km. under (CG) SKY Project

APPLICATION SUBMITTED BY:

TELESONIC NETWORKS LIMITED



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1 Introduction and Background

1.1 Background

The Chhattisgarh Infotech Promotion Society (CHiPS) has selected an implementation partner (i.e. Telesonic Networks Limited) for Sanchar Kranti Yojna (CG-SKY) project. The Government has taken a leap forward to design the Sanchar Kranti Yojna (CG-SKY) for providing a solution to improve the telecom connectivity in the state of Chhattisgarh by incentivizing the telecom operators to install Cell-Sites. In order to create commercial viability for Telecom operators to invest in the network infrastructure the Government is distributing approx. 50 lakh Smartphones. The primary objective is to ensure the mobile network connectivity is extended to all villages in state of Chhattisgarh with a population of 1000 or above as per the 2011 census and to further strengthen network coverage in all towns and villages, which already have coverage by either erecting new telecom towers or upgradation of existing towers. Based on preliminary assessment, besides the urban areas, approximately 14,000 villages will come under network connectivity and approximately 50,80,000 Smartphones will be distributed under the CG-SKY scheme. The scheme would cover all villages and towns in the State of Chhattisgarh, except those villages having less than 1,000 population and not having connectivity. It may be noted that villages with less than 1,000 population, but having connectivity shall be considered for the CG-SKY.

1.2 Proposed Routes

Following image (Fig-1) shows the proposed routes in Kawardha Division



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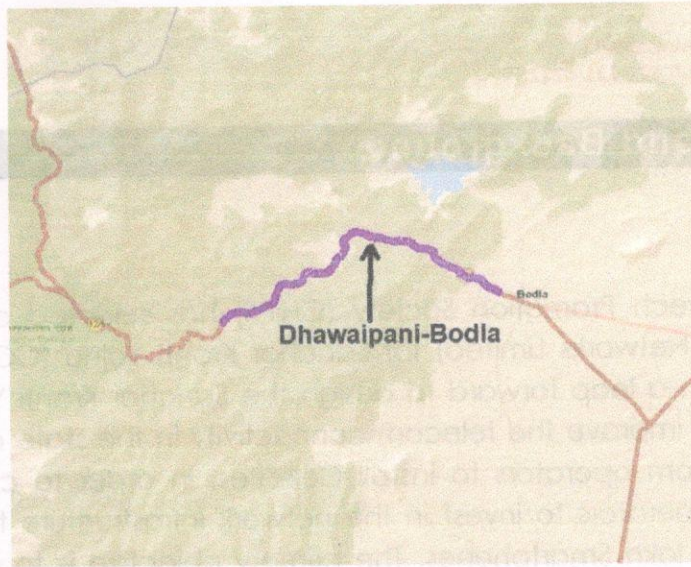
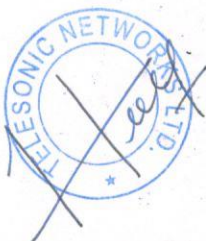


Fig-1: OFC Cable Proposed Routes on Online Map in Kawardha Division.

1.3 Work Location

The proposed OFC Cable route in Kawardha Forest Division (Tehsils covered along the route are: Bodla ; District: Kawardha). The Division length is approx. 12.934 km. The survey site passes through forest ranges – Kawardha forest division. The OFC Cable route is covered under Survey of India Toposheets 64F4 on RF 1:50000.



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Fig-2: OFC Cable Proposed Routes on Satellite Imagery in Kawardha Division.



1.4 Objective

As per directives of Ministry of Environment & Forests (MoEF) dated 8th July 2011; all applications for Forest Diversion, under Forest Conservation Act, 1980 must be accompanied with Geo-referenced shape file, showing the boundary of the proposed area (both soft copy and hard copy maps), prepared using Differential GPS (DGPS) and the same should be uploaded to MoEF website along with the online application.

To meet this requirement, Telesonic Networks Limited entrusted the DGPS survey work to

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Fig-3: OTC Cable Proposed Route on Satellite Image in Kowardi Division.



1.4 Objective

As per directives of Ministry of Environment & Forests (MoEF) dated 8th July 2017, all applications for Forest Division under Forest Conservation Act, 1980 and its amendments should be accompanied with Geo-referenced shape file showing the boundary of the proposed project area (both soft copy and hard copy map), prepared using Differential GPS. The same should be uploaded to MoEF website along with the online application. To meet this requirement, Telesonic Networks Limited entrusted the DGPS survey work to

2 Cope of Work

1. Establishment of one base station with 72 Hours observation and secondary control points at every 10km along the proposed route.
2. DGPS Survey for collection of ground coordinates along the OFC Cable trench at every 50m interval and/or at every turn/bend along the proposed trench. The DGPS data is collected at forest patches only.
3. Data processing and Interpretation
 - a. Geo-referencing of SOI Toposheet (1:50000), Forest Stock map (1:15000, if available) and satellite imagery
 - b. Creation of OFC Cable trench boundary vector map using the DGPS Surveyed data
 - c. Superimposition of cable route layer on Geo-referenced forest maps, SOI Toposheet and Satellite imagery.
 - d. Computation of Forest area proposed for diversion. It includes Reserved/Protected Forest & Revenue Forest.
 - e. Preparation of Geo-referenced forest map at 1:15000 scale, and SOI Toposheet at 1:50000 scale.
 - f. Preparation of DGPS survey report along with soft copy of maps in shapefile format and kml file
4. Printing of report and Geo-referenced maps and Technical compliance.





3 Deliverables

The deliverables envisaged for the assignment are described below

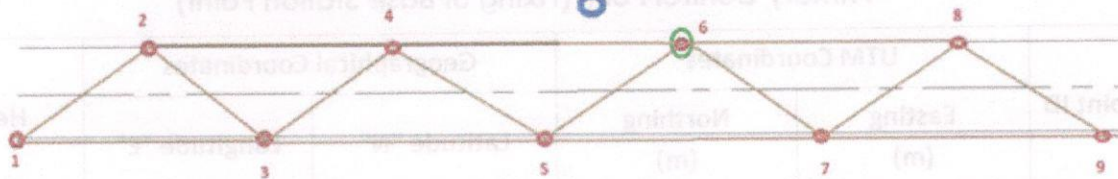
1. Post processed DGPS observations data as well as raw data in RINEX format.
2. DGPS Reports - Base line & network adjustment report for the primary and Secondary Control Points.
3. Geo-referenced SOI maps & forest block maps based on DGPS observations – Hard and Soft Copy (SHP and KML formats).
4. Proposed Forest Diversion area statement as per DGPS Survey
5. DGPS Survey and mapping report



4 Technical Approach (Brief Description)

4.1 GCP Establishment for (DGPS) Survey:

Example of defined Triangular Network GCP method.

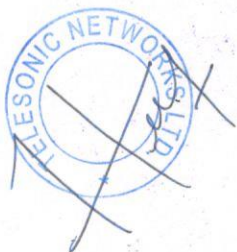


-  Primary Control Point (PCP)
-  Secondary Control Point (SCP)
-  Temporary Bench Mark (TBM)

Primary Control Point: 72 Hours of DGPS observation for Post Processing the PCP data with IGS stations.

Secondary Control Point: 2 - 4 Hours of DGPS observation for Post Processing the SCP data with PCP Data.

Temporary Bench Mark: 1 Hour of DGPS observation for improving the spatial accuracy of the point cloud data.



5 Control Points

Primary Control Point (Fixing of Base Station Point)

Details of Primary Control Points Used for Fixing of Base Station Point are given

Below

Primary Control Point (Fixing of Base Station Point)

Sr.No.	Point ID	UTM Coordinates		Geographical Coordinates		Height
		Easting (m)	Northing (m)	Latitude "N"	Longitude "E"	
1	P1	516135.9999	2453228.9998	22° 11' 3.287" N	81° 9' 23.500" E	456.285
2	P2	516138.0000	2453148.9999	22° 11' 0.685" N	81° 9' 23.567" E	453.542
3	P3	516176.0000	2453199.9999	22° 11' 2.342" N	81° 9' 24.896" E	454.761
4	P4	516145.0000	2453081.9999	22° 10' 58.506" N	81° 9' 23.809" E	463.296
5	P5	516044.0000	2453194.9999	22° 11' 2.184" N	81° 9' 20.286" E	455.371
6	P6	516088.0000	2453172.9999	22° 11' 1.467" N	81° 9' 21.822" E	455.676
7	P7	516088.0000	2453100.9999	22° 10' 59.126" N	81° 9' 21.820" E	457.2



6 DGPS Survey Results

The total route length is approx. 12.934 km and the proposed forest area for diversion is 0.536 Ha. Forest Area Statement Report is in Annexure-1, and DGPS coordinates and forest patch boundary coordinates is in Annexure-2. The geo-referenced maps are in Annexure - 3.

6.1 Forest Area Statement (Annexure-1):

SCHEDULE OF FOREST LAND - RESERVE & PROTECTED FOREST									
KAWARDHA_DIVISION- FOREST AREA STATEMENT									
SPAN NAME	SR. NO.	PATCH NUMBER	DIVISION	RANGE	VILLAGE NAME	COMPARTMENT	TYPE OF LAND	DIVERSION AREA (in HA)	LENGTH (KM)
Dhawaipani-Bodla	1	Patch_1_1	Kawardha	Kawardha	Banjari	60	Reserved Forest	0.056	1.120
	2				Palak	61		0.112	2.240
	3					63		0.008	0.160
	4	Patch_1_2			Chor Bhatti	313		0.097	1.940
	5					64	0.017	0.340	
	6				Dayalpur Plot	315	Protected Forest	0.093	1.860
	7				Chor Bhatti	65	Reserved Forest	0.153	3.060
TOTAL FOREST AREA								0.536	10.720
Total Route Length (in KM)			Total Forest Patch Length (in KM)		OFC Cable Trench Width (in KM)		Total Forest Diversion Area (in HA)		
12.934			10.720		0.0005		0.536		
Summary Of Forest And Non Forest Area									
Protected Forest, Reserved Forest & Orange Area (in HA)				Revenue Forest Area (in HA)			Non Forest Area (in HA)		
0.536				0.000			0.111		

वन परिक्षेत्र अधिकारी
कवर्धा

Divisional Forest Officer
Kawardha, Division Kawardha

उप वन मंडलाधिकारी
कवर्धा, वन मंडल, कवर्धा



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6.2 DGPS Surveyed coordinates of Forest Patches (Annexure-2):

DGPS Survey Points						
KAWARDHA_DIVISION						
Sr.No.	Point ID	Patch No	UTM Coordinates		Geographical Coordinates	
			Easting(m)	Northing(m)	Latitude "N"	Longitude "E"
1	P1	Patch-1_1	511685.6586	2450002.533	22° 9' 18.479" N	81° 6' 48.002" E
2	P2		511779.2582	2450119.524	22° 9' 22.282" N	81° 6' 51.273" E
3	P3		511884.7619	2450226.002	22° 9' 25.742" N	81° 6' 54.960" E
4	P4		511998.5448	2450323.686	22° 9' 28.916" N	81° 6' 58.935" E
5	P5		512130.0836	2450391.557	22° 9' 31.121" N	81° 7' 3.529" E
6	P6		512279.63	2450401.823	22° 9' 31.451" N	81° 7' 8.751" E
7	P7		512429.5404	2450406.374	22° 9' 31.595" N	81° 7' 13.986" E
8	P8		512578.5542	2450391.424	22° 9' 31.105" N	81° 7' 19.188" E
9	P9		512727.5695	2450391.627	22° 9' 31.107" N	81° 7' 24.391" E
10	P10		512874.2929	2450421.818	22° 9' 32.085" N	81° 7' 29.515" E
11	P11		513002.9449	2450498.276	22° 9' 34.569" N	81° 7' 34.009" E
12	P12		513132.7467	2450573.2	22° 9' 37.002" N	81° 7' 38.543" E
13	P13		513265.0188	2450643.856	22° 9' 39.296" N	81° 7' 43.164" E
14	P14		513405.829	2450694.335	22° 9' 40.934" N	81° 7' 48.082" E
15	P15		513541.7414	2450754.952	22° 9' 42.902" N	81° 7' 52.829" E
16	P16		513616.5478	2450881.533	22° 9' 47.017" N	81° 7' 55.445" E
17	P17		513639.6854	2451029.478	22° 9' 51.828" N	81° 7' 56.257" E
18	P18		513677.7079	2451174.207	22° 9' 56.534" N	81° 7' 57.590" E
19	P19		513728.9146	2451315.152	22° 10' 1.116" N	81° 7' 59.382" E
20	P20		513810.7934	2451439.166	22° 10' 5.147" N	81° 8' 2.245" E
21	P21		513944.8705	2451500.964	22° 10' 7.153" N	81° 8' 6.928" E
22	P22		514094.5138	2451497.357	22° 10' 7.032" N	81° 8' 12.153" E
23	P23		514244.0084	2451485.058	22° 10' 6.627" N	81° 8' 17.373" E
24	P24		514390.7304	2451508.976	22° 10' 7.401" N	81° 8' 22.497" E
25	P25		514528.1888	2451568.858	22° 10' 9.344" N	81° 8' 27.299" E
26	P26		514629.1718	2451675.883	22° 10' 12.822" N	81° 8' 30.828" E
27	P27		514688.1416	2451813.712	22° 10' 17.303" N	81° 8' 32.892" E
28	P28		514790.5407	2451919.782	22° 10' 20.750" N	81° 8' 36.471" E
29	P29		514935.1912	2451952.505	22° 10' 21.809" N	81° 8' 41.523" E
30	P30		515080.7731	2451917.83	22° 10' 20.677" N	81° 8' 46.606" E
31	P31		515228.5959	2451900.678	22° 10' 20.115" N	81° 8' 51.767" E
32	P32		515378.298	2451909.908	22° 10' 20.410" N	81° 8' 56.995" E
33	P33		515523.4736	2451943.165	22° 10' 21.487" N	81° 9' 2.065" E
34	P34		515641.165	2452033.602	22° 10' 24.425" N	81° 9' 6.178" E
35	P35		515724.7155	2452157.994	22° 10' 28.468" N	81° 9' 9.100" E
36	P36		515797.2739	2452289.133	22° 10' 32.730" N	81° 9' 11.638" E
37	P37		515852.409	2452428.182	22° 10' 37.251" N	81° 9' 13.568" E
38	P38		515911.7038	2452490.32	22° 10' 39.270" N	81° 9' 15.641" E
39	P39	Patch-1_2	516238.2475	2453309.921	22° 11' 5.915" N	81° 9' 27.074" E
40	P40		516342.7089	2453417.549	22° 11' 9.412" N	81° 9' 30.726" E
41	P41		516467.9192	2453497.194	22° 11' 11.998" N	81° 9' 35.101" E
42	P42		516616.3128	2453503.77	22° 11' 12.207" N	81° 9' 40.284" E
43	P43		516765.4781	2453488.526	22° 11' 11.706" N	81° 9' 45.493" E

DGPS Survey Points

KAWARDHA_DIVISION

Sr.No.	Point ID	Patch No	UTM Coordinates		Geographical Coordinates	
			Easting(m)	Northing(m)	Latitude "N"	Longitude "E"
44	P44	Patch-1_2	516912.9588	2453464.596	22° 11' 10.923" N	81° 9' 50.642" E
45	P45		517037.0984	2453381.668	22° 11' 8.221" N	81° 9' 54.974" E
46	P46		517170.4933	2453317.216	22° 11' 6.120" N	81° 9' 59.630" E
47	P47		517319.2671	2453298.24	22° 11' 5.498" N	81° 10' 4.825" E
48	P48		517468.5084	2453283.295	22° 11' 5.006" N	81° 10' 10.036" E
49	P49		517611.7689	2453241.774	22° 11' 3.651" N	81° 10' 15.037" E
50	P50		517754.6303	2453198.064	22° 11' 2.224" N	81° 10' 20.025" E
51	P51		517901.0153	2453165.527	22° 11' 1.160" N	81° 10' 25.135" E
52	P52		518047.6726	2453137.28	22° 11' 0.236" N	81° 10' 30.256" E
53	P53		518196.3629	2453155.451	22° 11' 0.821" N	81° 10' 35.449" E
54	P54		518346.2154	2453162.039	22° 11' 1.030" N	81° 10' 40.682" E
55	P55		518494.1887	2453141.32	22° 11' 0.350" N	81° 10' 45.849" E
56	P56		518628.4758	2453075.627	22° 10' 58.209" N	81° 10' 50.536" E
57	P57		518737.8424	2452973.555	22° 10' 54.885" N	81° 10' 54.351" E
58	P58		518852.7185	2452878.897	22° 10' 51.802" N	81° 10' 58.358" E
59	P59		518996.3107	2452844.223	22° 10' 50.668" N	81° 11' 3.371" E
60	P60		519141.0291	2452830.869	22° 10' 50.228" N	81° 11' 8.424" E
61	P61		519286.7114	2452801.671	22° 10' 49.273" N	81° 11' 13.510" E
62	P62		519416.9531	2452727.691	22° 10' 46.861" N	81° 11' 18.055" E
63	P63		519467.0235	2452594.959	22° 10' 42.542" N	81° 11' 19.798" E
64	P64		519507.4548	2452457.082	22° 10' 38.057" N	81° 11' 21.204" E
65	P65		519625.7853	2452365.074	22° 10' 35.059" N	81° 11' 25.332" E
66	P66		519744.003	2452272.887	22° 10' 32.056" N	81° 11' 29.456" E
67	P67		519878.7835	2452207.413	22° 10' 29.921" N	81° 11' 34.160" E
68	P68		520014.6456	2452143.98	22° 10' 27.852" N	81° 11' 38.901" E
69	P69		520150.8348	2452081.259	22° 10' 25.807" N	81° 11' 43.654" E
70	P70		520282.4669	2452010.016	22° 10' 23.484" N	81° 11' 48.247" E
71	P71		520392.1564	2451907.934	22° 10' 20.160" N	81° 11' 52.073" E
72	P72		520504.3022	2451809.424	22° 10' 16.951" N	81° 11' 55.984" E
73	P73		520625.9588	2451721.795	22° 10' 14.096" N	81° 12' 0.228" E
74	P74		520808.366	2451689.687	22° 10' 13.044" N	81° 12' 6.596" E

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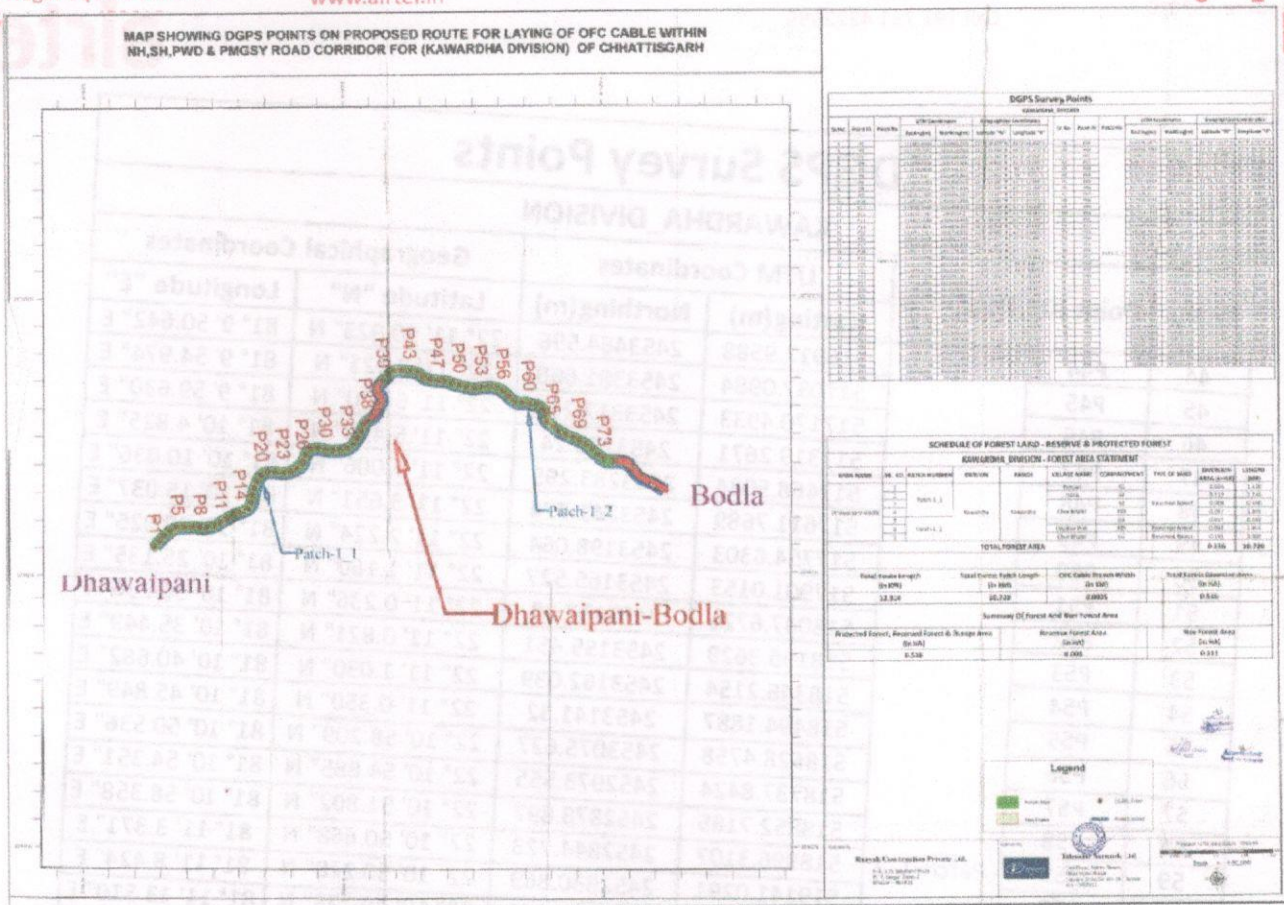
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No-5

6.3 DGPS Surveyed coordinates of Forest Patches (Annexure-2):

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MAP SHOWING DGPS POINTS ON PROPOSED ROUTE FOR LAYING OF OFC CABLE WITHIN NH,SH,PWD & PMGSY ROAD CORRIDOR FOR (KAWARDHA DIVISION) OF CHHATTISGARH



6.4 Geo-Referenced Maps of the Proposed Route (Annexure-3):

