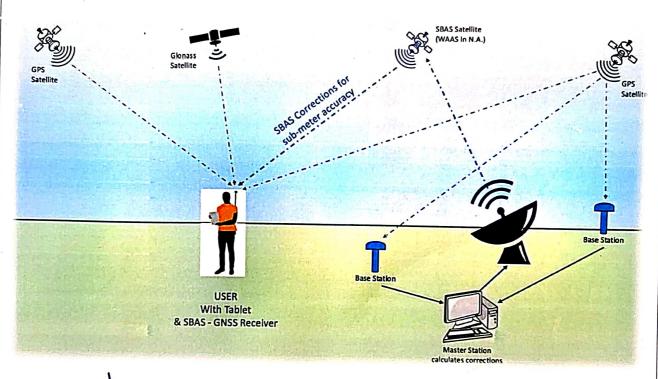
D.G.P.S. SURVEY REPORT FOR

COMPENSATORY AFFORESTATION PLANTATION LAND AGAINST DIVERSION OF ALTERNATIVE PLANTATION UNDER KONDAGAON BYPASS ROAD CONSTRUCTION

FOREST DIVISION SOUTH KONDAGAON
DISTRICT KONDAGAON
CHHATTISGARH





Submitted To

(AC

Executive Engineer, PWD Kondagaon, District Kondagaon, (C.G).



Report Prepared By

COMPUTER PLUS Software Development &Consultancy Devendra Nagar, Raipur, (C.G).

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MAPS ON A3 & A0 PAPER SIZE PRINTOUT_		
1. Location Map	, i	
2. Geo Reference Survey Site on SOI Toposheet		
3. Survey Site on Satellite Image	£12 } ".	
4. Survey Site Superimpose on Google Image	74 THE	·
5. Survey Site on SOI Toposheet (A0 Size)		
DATA ENCLOSED IN SOFT COPY		and the
1. Survey Report		
2. KML File		
3. Maps in JPEG & PDF Format		
4 SHP File		



1. ABOUT US

Computer Plus an ISO 9001:2015 certified organization working in the field of I.T. Consulting & Software Services. We are registered organization under **Directorate of Geology and Mining, Chhattisgarh**. We are serving since 1998 & head office in Raipur, (C.G.), with core competence in the areas of Integrated Business Solutions with Implementation and Support.

Our Team:

We're justifiably proud of the team we've assembled. Initially numbering just two programmers, **Computer Plus** has grown steadily and now has over 250 staff members. The **Computer Plus** team is made up of highly-qualified, talented and innovative IT and GIS professionals each with their own area of expertise. Their experience spans the full range of custom software development, from small entrepreneurial projects to complex systems for major corporations.

Our Mission:

Computer Plus's mission is to solve challenging technical problems in partnership with our clients. How we achieve it:

- We understand the business needs of our clients, and how technology can be a tool to make modern businesses more profitable for both private and government sector.
- **Computer Plus** combines technical excellence with great customer service and value for money.
- We value creativity and collaboration; ideas are shared and everybody contributes on an individual basis toward the common goal.

We create new teams for each project, ensuring the best possible combination of skills and experience to meet the client's needs and deliver high quality solutions.

2. INTRODUCTION TO DGPS

Differential GPS/DGPS Positional Accuracy +/- I meter or so Same Satellite Constellation Code Phase/Pseudorange Radio Link (Base Station - Rover/or Rovers) a) Less information than RTK (Track 4 Satellites Minimum) b) Slower transmission c) Real-time or post-processed results **Transmission** 100 to 200 km Antenna Base Station (Known Position) Satellite (Optional) Rover Building (Optional) (Project Point) RF Tower (Optional)

The term DGPS is sometimes used to refer to differential GPS that is based on pseudo ranges, aka code phase. Even though the accuracy of code phase applications was given a boost with the elimination of Selective Availability (SA) in May 2000 consistent accuracy better than the 2-5-meter range still requires reduction of the effect of correlated ephemeris and atmospheric errors by differential corrections. Though the corrections could be applied in post-processing services that supply these corrections, most often operate in real-time. In such an operation pseudo range-based version can offer meter- or even sub meter results.

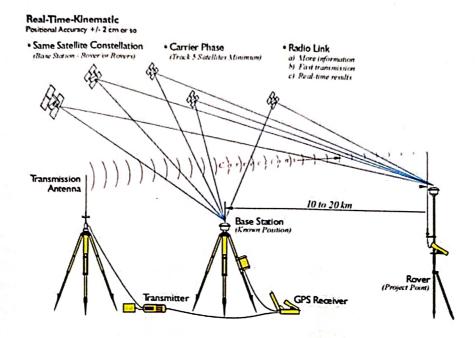
Usually, pseudo range corrections are broadcast from the base to the rover or rovers for each satellite in the visible constellation. Rovers with an appropriate input/output (I/O) port can receive the correction signal and calculate coordinates. The real-time signal comes to the receiver over a data link. It can originate at a project specific base station or it can come to the user through a service of which there are various categories. Some are open to all users and some are by subscription only. Coverage depends on the spacing of the beacons, aka transmitting base stations, their power, interference, and so forth. Some systems require two-way, some one-way, communication with the base stations. Radio systems, geostationary satellites, low-earth-orbiting.

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SURVEY METHOD

1) RTK (Real Time Kinematic)

A. Real-time Kinematic



Most, not all, GPS surveying relies on the idea of differential positioning. The mode of a base or reference receiver at a known location logging data at the same time as a receiver at an unknown location together provide the fundamental information for the determination of accurate coordinates. While this basic approach remains today, the majority of GPS surveying is not done in the static post-processed mode. Post-processing is most often applied to control work. Now, the most commonly used methods utilize receivers on reference stations that provide correction signals to the end user via a data link sometimes over the Internet, radio signal, or cell phone and often in real-time.

In this category of GPS surveying work there is sometimes a distinction made between code- based and carrier-based solutions. In fact, most systems use a combination of code and carrier measurements so the distinction is more a matter of emphasis rather than an absolute difference. Well that's a bit of discussion about static surveying, but as you know, a good deal of GPS these days is done not static. Much work is now done with DGPS or real-time kinematic, RTK.

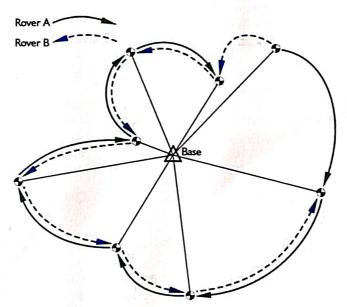
Errors in satellite clocks, imperfect orbits, the trip through the layers of the atmosphere, and many other sources contribute inaccuracies to GPS signals by the time they reach a receiver.

These errors are variable, so the best to way to correct them is to monitor them as they happen. A good way to do this is to set up a GPS receiver on a

station whose position is known exactly, a base station. This base station receiver's computer can calculate its position from satellite data, compare that position with its actual known position, and find the difference. The resulting error corrections can be communicated from the base to the rover. It works well, but the errors are constantly changing so a base station has to monitor them all the time, at least all the time the rover receiver or receivers are working. While this is happening, the rovers move from place to place collecting the points whose positions you want to know relative to the base station, which is the real objective after all. Then all you have to do is get those base station corrections and the rover's data together somehow. That combination can be done over a data link in real-time, or applied later in post processing.

Real-time positioning is built on the foundation of the idea that, with the important exceptions of multipath and receiver noise, GPS error sources are correlated. In other words, the closer the rover is to the base the more the errors at the ends of the baseline match. The shorter the baseline, the more the errors are correlated. The longer the baseline, the less the errors are correlated.

The base station is at a known point, whether it was on a building permanently or it's a tripod mounted base station. The fact that it is in a known position allows the base station to produce corrections. The constellation is telling the base station that it is in a slightly different place, so corrections can be created to send to the rover at the unknown point. The corrections are applied in real time.



RADIAL GPS

Such real-time surveying is essentially radial. There are advantages to the approach. The advantage is a large number of positions can be established in a short amount of time with little or no planning. The disadvantage is that there is little or no redundancy in positions derived, each of the baselines originates from the same control station. Redundancy can be incorporated, but it requires repetition of the observations so each baseline is determined with more than one GPS constellation. One way to do it is to occupy the

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project points, the unknown positions, successively with more than one rover. It is best if these successive occupations are separated by at least 4 hours and not more than 8 hours so the satellite constellation can reach a significantly different configuration.

RTK and DGPS are radial. You have a known point in the middle, the base, and then the unknown points around it. This provides little geometric solidity. If there's an error in one of these radial base lines, it would be tough to catch it because there's no real redundancy. The illustration shows a way around this difficulty. There are two receivers, A and B, and it's possible by double occupation, one receiver going one way and the other going the other, by double occupying the unknown points to get some redundancy and some checks against the positions from a base. Another way to do it is to use one receiver. That receiver would occupy each point twice with four to eight hours between the first occupation and the second occupation on the point. Another way is to move the base to another known point. Then if you have vectors from another base into these points, you have a check. This approach allows a solution to be available from two separate control stations. Obviously, this can be done with re-occupation of the project points after one base station has been moved to a new control point, or two base stations can be up and running from the very outset and throughout of the work as would be the case using two CORS stations. It is best if there are both two occupations on each point and each of the two utilize different base stations.

A more convenient but less desirable approach is to do a second occupation almost immediately after the first. The roving receiver's antenna is blocked or tilted until the lock on the satellites is interrupted. It is then re-oriented on the unknown position a second time for the repeat solution. This does offer a second solution, but from virtually the same constellation.

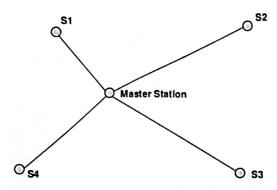
More efficiency can be achieved by adding additional roving receivers. However, as the number of receivers rises, the logistics become more complicated, and a survey plan becomes necessary. Also, project points that are simultaneously near one another but far from the control station should be directly connected with a baseline to maintain the integrity of the survey. Finally, if the base receiver loses lock and it goes unnoticed, it will completely defeat the radial survey for the time it is down.

These are a few possibilities to consider when you are doing a real-time survey.

An advantage to continuously operating reference station network is that since those bases are operating simultaneously and all the time, it's possible to download the positions from more than one base and process your new position based on these continuously operating reference stations and have some redundancy.

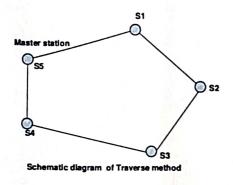
2) STATIC METHOD

I. Rapid Static Method

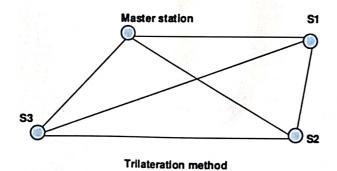


Schematic diagram of Rapid Static Method

II.Traverse Method



III. Trilateration Method



3. METHODOLOGY USED

Following Methodology have been adopted for DGPS Survey of the proposed site.

UNDER FOREST AREA MAKE PERMANENT BENCH MARK (PBM POINTS) ALREADY
AVAILABLE ON THAT PBM POINT STATIC OBSERVATION HAVE BEEN TAKEN FOR 12HOURS
OF OBSERVATION POINTS HAVE TO BE GENERATED WHICH WILL BE USED AS
CORRECTION POINTS.



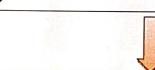
USING THIS PBM AS CORRECTION POINT ALL OTHER BOUNDARY PILLARS HAVE TO SURVEYED



ALL COLLECTED PILLAR POINTS HAVE TO BE CONNECTED TO MAKE POLYGON BOUNDARY

COLLECTED DATA HAVE TO BE SUPERIMPOSE ON TOPOSHEET MAP WHICH HAVE BEEN COLLECTED FROM SURVEY OF INDIA

COLLECTED DATA HAVE TO BE
SUPERIMPOSE ON SATELLITE
IMAGE WHICH HAVE BEEN
COLLECTED FROM NRSC
HYDERABAD



REPORT PREPARATION & MAP PREPARED AS PER REQUIRED SCALE

4. DETAILS OF SURVEYED SITE

The surveyed area for Compensatory Afforestation Plantation Land against Diversion of alternative Plantation under Kondagaon Bypass Road Construction, which comes under Block Kondagaon, District Kondagaon and Chhattisgarh. Kondagaon Bus Stand longitude latitude is 81°39'46.07"E 19°35'24.70"N. Survey site is located 54.4 Km from Kondagaon Bus Stand. Survey site comes under Forest Division South Kondagaon, Forest Range Narangi and Forest Circle Kanker.

It is covered in Survey of India Toposheet No. 65E7 & 65E11.

Details of area surveyed and land details are given below:

AREA DETAILS & LAND CLASSIFICATION

Sr.No.	District	Division	Tehsil	Village	Land Type	Khasra No.	Patch No.	Area (In Hectare)
1	1 Kondagaon South Kondagaon	Kondagaon Adnar	Revenue Forest	1/1	Patch I	11.894		
2					Patch II	6.714		
Total						18.608		

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S.D.O \
West Kondagaon

Divisional Forest Officer
South Kondagaon Division
KONDAGAON

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नारंगी परिक्षेत्र

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)

Geographical Coordinates		UTM Coordinates			
Point ID	Longitude	Latitude	Easting	Northing	Height
1	81° 30' 0.148" E	19° 29' 11.633" N	552474.932000	2154742.581000	564.884
2	81° 29' 57.652" E	19° 29' 12.083" N	552402.124000	2154756.203000	567.161

Surveyed Ground Control Points

Patch - I Coordinates						
	Point	Geographic	al Coordinates	UTM Coordinates		
Sr.No.	ID	Longitude	Latitude	Easting	Northing	Height
1	1	81° 29' 52.216" E	19° 29' 7.810" N	552244.036000	2154624.401000	566.394
2	2	81° 29' 53.361" E	19° 29' 8.574" N	552277.362000	2154647.986000	566.230
3	3	81° 29' 55.446" E	19° 29' 9.569" N	552338.039000	2154678.726000	565.790
4	4	81° 29' 57.620" E	19° 29' 10.391" N	552401.348000	2154704.188000	565.192
5	5	81° 29' 59.133" E	19° 29' 11.146" N	552445.392000	2154727.506000	564.607
6	6	81° 30' 0.901" E	19° 29' 11.910" N	552496.868000	2154751.151000	563.956
7	7	81° 30' 2.913" E	19° 29' 12.730" N	552555.432000	2154776.543000	563.354
8	8	81° 30' 4.331" E	19° 29' 13.527" N	552596.697000	2154801.153000	563.074
9	9	81° 30' 5.834" E	19° 29' 14.845" N	552640.409000	2154841.780000	563.204
10	10	81° 30' 7.287" E	19° 29' 16.252" N	552682.622000	2154885.149000	562.769
11	11	81° 30' 8.447" E	19° 29' 17.227" N	552716.347000	2154915.224000	562.147
12	12	81° 30' 9.364" E	19° 29' 18.056" N	552743.015920	2154940.797950	562.906
13	13	81° 30' 7.941" E	19° 29' 19.154" N	552701.425016	2154974.430870	563.000
14	14	81° 30' 5.512" E	19° 29' 19.872" N	552630.559000	2154996.286000	563.372
15	15	81° 30' 4.601" E	19° 29' 20.645" N	552603.944000	2155019.955000	563.378
16	16	81° 30' 4.455" E	19° 29' 21.467" N	552599.613596	2155045.210130	564.093
17	17	81° 30' 4.600" E	19° 29' 22.363" N	552603.766239	2155072.762190	564.008
18	18	81° 30' 4.924" E	19° 29' 23.963" N	552613.064325	2155121.973810	563.982
19	19	81° 30' 5.077" E	19° 29' 25.770" N	552617.349988	2155177.528520	563.000
20	20	81° 30' 4.851" E	19° 29' 26.962" N	552610.670812	2155214.149000	563.000
21	21	81° 30' 4.055" E	19° 29' 26.650" N	552587.473000	2155204.510000	563.392
22	22	81° 30' 2.512" E	19° 29' 26.063" N	552542.566000	2155186.331000	565.758
23	23	81° 30' 0.678" E	19° 29' 24.989" N	552489.184000	2155153.149000	566.890
24	24	81° 29' 58.540" E	19° 29' 23.503" N	552426.993000	2155107.313000	570.442
25	25	81° 29' 57.710" E	19° 29' 21.969" N	552402.944000	2155060.070000	572.681
26	26	81° 29' 56.880" E	19° 29' 20.971" N	552378.843000	2155029.317000	573.986

	Point	Geographical Coordinates		Ü		
Sr.No.	ID	Longitude	Latitude	Easting	Northing	Height
27	27	81° 29' 56.347" E	19° 29' 18.602" N	552363.508000	2154956.473000	574.329
28	28	81° 29' 56.557" E	19° 29' 17.266" N	552369.764000	2154915.425000	574,236
29	29	81° 29' 56.424" E	19° 29' 15.327" N	552366.054000	2154855.793000	572.474
30	30	81° 29' 55.699" E	19° 29' 13.955" N	552345.034000	2154813.561000	572.036
31	31	81° 29' 54.759" E	19° 29' 12.616" N	552317.741000	2154772.347000	572.310
32	32	81° 29' 53.548" E	19° 29' 10.329" N	552282.659162	2154701.928200	570.000
			Patch - II Coor	dinates	en la companya di Santan	
Sr.No.	Point	Geographica	l Coordinates	the state of the s	M Coordinates	
Silito.	ID	Longitude	Latitude	Easting	Northing	Height
33	A1	81° 29' 51.523" E	19° 29' 6.973" N	552223.934000	2154598.598000	565.469
34	A2	81° 29' 53.013" E	19° 29' 4.106" N	552267.621000	2154510.593000	561.317
35	А3	81° 29' 55.029" E	19° 29' 2.951" N	552326.480000	2154475.265000	559.220
36	A4	81° 29' 56.132" E	19° 29' 4.281" N	552358.533000	2154516.240000	559.744
37	A5	81° 29' 58.256" E	19° 29' 4.939" N	552420.378000	2154536.646000	559.633
38	A6	81° 29' 59.835" E	19° 29' 5.343" N	552466.378000	2154549.202000	558.769
39	A7	81° 30' 1.129" E	19° 29' 6.397" N	552503.990000	2154581.725000	559.023
40	A8	81° 30' 0.327" E	19° 29' 8.477" N	552480.431000	2154645.578000	561.616
41	A9	81° 30' 0.921" E	19° 29' 9.667" N	552497.655000	2154682.209000	562.605
42	A10	81° 30' 2.412" E	19° 29' 8.934" N	552541.162000	2154659.808000	560.779
43	A11	81° 30' 3.445" E	19° 29' 9.767" N	552571.218000	2154685.503000	560.393
44	A12	81° 30' 3.681" E	19° 29' 9.841" N	552578.075000	2154687.784000	560.249
45	A13	81° 30' 4.421" E	19° 29' 11.178" N	552599.540000	2154728.966000	562.314
46	A14	81° 30' 6.507" E	19° 29' 11.896" N	552660.273000	2154751.212000	561.289
47	A15	81° 30' 8.496" E	19° 29' 11.674" N	552718.288000	2154744.541000	560.369
48	A16	81° 30' 9.009" E	19° 29' 11.521" N	552733.254000	2154739.896000	560.602
49	A17	81° 30' 9.424" E	19° 29' 13.048" N	552745.217000	2154786.854000	560.379
50	A18	81° 30' 9.537" E	19° 29' 14.586" N	552748.353000	2154834.157000	561.132
51	A19	81° 30' 9.562" E	19° 29' 15.122" N	552749.061000	2154850.610000	561.303
52	A20	81° 30' 11.523" E	19° 29' 15.628" N	552806.173000	2154866.340000	560.568
53	A21	81° 30' 11.789" E	19° 29' 15.629" N	552813.915000	2154866.395000	560.481
54	A22	81° 30' 10.511" E	19° 29' 18.446" N	552776.411000	2154952.866000	561.149
55	A23	81° 30' 7.743" E	19° 29' 16.079" N	552695.935000	2154879.880000	562.587
56	A24	81° 30' 5.728" E	19° 29' 14.163" N	552637.382000	2154820.817000	562.974
57	A25	81° 30' 3.753" E	19° 29' 12.582" N	552579.950000	2154772.059000	562.742
58	A26	81° 30' 0.086" E	19° 29' 11.089" N	552473.174000	2154725.849000	563.970
59	A27	81° 29' 55.890" E	19° 29' 9.179" N	552351.038000	2154666.786000	565.629

P.W.D. Kondagaon Division KONDAGAON

S.D.O
West Kondagaon

परिकेश अधिकारी नारंगी परिक्षेत्र Agipur (C.G.

Divisional Forest Officer South Kondagaon Division KONDAGAON

6. SURVEY DATE

Survey Date	Observation	Survey Time	Village	
23-02-2022	Base Observation	03:00 PM To 04.30 PM	(1) Tag	
	Survey	11:00 AM To 05.00 PM	Adnar	

Weather was pleasant with clear sun light. Survey point marking and temporary pillar posting has been done by a team of **Computer Plus.** Comprising of following members:

- 1. Mr. Leeladhar Nishad
- 2. Mr. Rishikesh Barik
- 3. Mr. Mansingh Baghel
- 4. Mr. Sukhdev Baghel

The team was headed by **Mr. Leeladhar Nishad** and Report is prepared by **T Preeti**.

Base Station Photographs



Survey Photographs with Staff







Executive Angineer
P.W.D. Kondagaon Division
KONDAGAON

