

PREPARATION OF BASE MAP FOR NEC CAMPUS & GEOTAGGING OF ELECTRICAL POLES BY USING TOTAL STATION & GPS

Doredla Nagaraju¹, Chavala Anil², Dudekula Nagur Basha³, Kolusu Siva Pavan Kumar⁴, Gudipalli Vinod⁵, Sura Jogi Reddy⁶

¹ASSISTANT PROFESSOR, DEPARTMENT OF CIVIL ENGINEERING, NEC (AUTONOMOUS), ANDHRA PRADESH, INDIA

^{2,3,4,5,6}UG STUDENT, DEPARTMENT OF CIVIL ENGINEERING, NEC (AUTONOMOUS), ANDHRA PRADESH, INDIA

Abstract – A project is to be initiated when we had undergone for preliminary survey of the particular site which is to be proposed. This study is carried out to undergo for the preliminary survey of the NEC college campus by finding the total area, the amenities etc. and the base map for the campus is prepared by using the recorded Total Station readings and plotting them in Surfer 8 Software. The work done is continued by geotagging the electrical poles present in the campus by using handheld GPS and the poles are tagged with respect to their respective global positioning ordinates.

Key Words: Survey, Base map, Total station, Geotagging, Area, Surfer 8 Software.

1. INTRODUCTION

A Total Station is an electronic/optical instrument used for angle measurement, distance measurements, and coordinate measurements. Total Stations can be remotely controlled and are mounted on Surveying Tripods. A Total Station uses a Surveying Prisms as a measurement target, and the ability to remotely control or automatically track these targets eliminates the need for an assistant staff. Real Time Kinematic is a technique used to increase the accuracy of GPS signals by using a fixed base station which wirelessly sends out corrections to a moving receiver.

Types of Gridding Methods:

- Inverse Distance to a Power
- Krigging
- Minimum Curvature
- Natural Neighbor
- Nearest Neighbor
- Radial Basis Functions
- Modified Shepard's Method
- Triangulation with Linear Interpolation
- Moving Average

2. Methodology

Procedure to record the readings:-

- Level the total station of the given station point by using (or) adjusting tripod legs and foot screws of total station Base Plate.
- Insert the battery to the total station and mount it on the tripod stand.
- Switch on the instrument and check whether the bubble is in the tilt range (or) not.
- Switch, on the laser by pressing the laser button and select plumb adjustment then laser will be displaced on the ground.
- Check accurately whether the instrument is placed exactly at the station point. Switch off the laser by pressing ESC button.
- Go to mode - B Page, in the opening window and select s - function by pressing F1.
- Select file option, in that select create, and enter File name then press ENT button. Your file is being created.
- In the menu page select station setup option by pressing F2. Select Rectangular coordinates in that dialogue box enter station
- Point name
X:
Y:
Z:
IH:
PC:
Remarks:
- Enter the reference values and press ENT Button. Station setup is created.
- Orientation setup dialogue box will appear.
- Place the Compass on the top of the total station and tilt the total station horizontally to the North direction (or) ENT the coordinates for the direction of the total station and press F5 to Enter the orientation Coordinates
- In the New Window.
Point Name: 01
X:
Y:
Z:

Remarks:

- Place the prism mounted on the stand at the First ground point and tilts the telescope and site the prism by swinging horizontally. And Press F1 button to measure the coordinate (or) levels of the First ground point. Levels will be displaced on the screen. Press F2 to save the measured coordinates of the First Point.
- Repeat the procedure as above for the No.of points required to generate (or) Prepare Contour Map.

- After selecting the sheet another dialogue box appears for Data columns, gridding method, grid line geometry, etc.
- Select X for Easting, Y for Northing and Z for OD. You can experiment with different gridding methods and parameters for them.

Work done by using Surfer (Software):-

Surfer is a grid-based mapping program that interpolates irregularly spaced XYZ data into a regularly spaced grid. Grids may also be imported from other sources, such as the United States Geological Survey (USGS). The grid is used to produce different types of maps including contour, color relief, and 3D surface maps among others. Many gridding and mapping options are available allowing you to produce the map that best represents your data.

Grid & Contour

Prepare an excel sheet with four columns containing data of 'UPHOLE NUMBER (UHNO),'EASTING','NORTHING', 'OPTIMUM DEPTH (OD)' as shown below.

Table 1

S.NO	X	Y	Z
1	1044.837	2032.053	100.215
2	1046.669	2027.792	100.417
3	1040.913	2022.225	100.253
4	1042.256	2008.702	100.495
5	1040.21	2012.575	100.643
6	1041.16	2005.058	100.391
7	1038.858	2005.823	100.104
8	1037.537	2006.047	100.084
9	1034.116	1999.803	100.109
10	1035.319	1993.863	100.123
11	1052.858	2003.071	100.668
12	1053.838	1997.65	100.742

Uphole number column is not compulsory for the contour map.

Preparing Grid

- Go to GRID → DATA. In the dialogue box select the excel file which contains the Optimum Depth data. If multiple sheets are there in the excel file it will prompt to select the sheet.

3. Results

Total Area:-

Boys Hostel – 1393.43 m²

Girls Hostel – 2923.88 m²

N.E.C.:-

Block 1(A) – 915.14 m²

I.T Block – 466.19 m²

Block 1(B) – 1394.19 m²

Block 2 – 2598.50 m²

Block 3 – 3934.16 m²

N.I.T.:-

Block 1 – 4724.62 m²

N.I.P.S:-

Block 1 – 1882.37 m²

Parking:-

Bus Parking – 5765.23 m²

Bike Parking – 426.0096 m²

AT M – 19.996 m²

Play Ground – 23691.84 m²

Open Spaces:-

Parking Lot – 3899.956 m²

NIPS Ground – 8536.07 m²

NIT Ground – 3191.62 m²

Open Space In front of Girls Hostel – 911.4107 m²

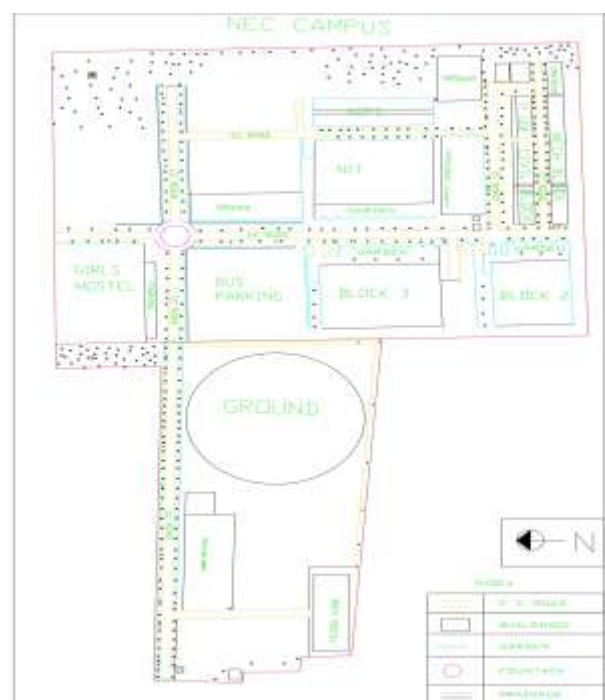


Figure 1:- Base Map for NEC campus

Geo Tagging of Electrical Poles in N.E.C College

Table 2

S.NO	LATITUDE X	LONGITUDE Y
1	16°12'2"	80°3'21"
2	16°12'2"	80°3'26"
3	16°12'2"	80°3'26"
4	16°12'2"	80°3'25"
5	16°12'4"	80°3'22"
6	16°12'3"	80°3'21"
7	16°12'3"	80°3'18"
8	16°12'3"	80°3'19"
9	16°12'3"	80°3'16"
10	16°12'4"	80°3'16"
11	16°12'4"	80°3'14"
12	16°12'4"	80°3'13"
13	16°12'0"	80°3'12"
14	16°12'0"	80°3'14"
15	16°12'0"	80°3'15"
16	16°11'59"	80°3'16"
17	16°11'59"	80°3'17"
18	16°11'59"	80°3'18"
19	16°12'0"	80°3'19"
20	16°12'2"	80°3'21"
21	16°12'1"	80°3'22"
22	16°12'0"	80°3'22"
23	16°11'59"	80°3'22"
24	16°11'57"	80°3'21"
25	16°11'56"	80°3'21"
26	16°11'55"	80°3'21"
27	16°11'56"	80°3'22"
28	16°11'56"	80°3'23"
29	16°11'56"	80°3'24"
30	16°11'56"	80°3'25"

4. CONCLUSION

A Survey on NEC campus had been done and the total land area of 129073.02 m² is obtained and the Total Built up Area is 20233.48 m² individually. The Base map from taken points in NEC Campus has been prepared by using the SURFUR software. A geotagging of street lights which are present in the NEC Campus had been done by using hand held GPS.

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BIOGRAPHIES


Doredla Nagaraju *
 ASSISTANT PROFESSOR,
 DEPARTMENT OF CIVIL
 ENGINEERING,
 NEC(AUTONOMOUS),
 ANDHRA PRADESH,INDIA



Chavala Anil
 UG STUDENT,
 DEPARTMENT OF CIVIL
 ENGINEERING,
 NEC(AUTONOMOUS),
 ANDHRA PRADESH,INDIA



Dudekula Nagur Basha
 UG STUDENT,
 DEPARTMENT OF CIVIL
 ENGINEERING,
 NEC(AUTONOMOUS),
 ANDHRA PRADESH,INDIA



Kolusu Siva Pavan Kumar
 UG STUDENT,
 DEPARTMENT OF CIVIL
 ENGINEERING,
 NEC(AUTONOMOUS),
 ANDHRA PRADESH,INDIA



Gudipalli Vinod
 UG STUDENT,
 DEPARTMENT OF CIVIL
 ENGINEERING,
 NEC(AUTONOMOUS),
 ANDHRA PRADESH,INDIA



Sura Jogi Reddy
 UG STUDENT,
 DEPARTMENT OF CIVIL
 ENGINEERING,
 NEC(AUTONOMOUS),
 ANDHRA PRADESH,INDIA