ADVANCED SURVEY

R. Jaya sankar[1], T. Arul prasath[2], P. Gayathri[2], B. Hari Haran[2], T. Roja[2]
(gayathricivil1808@gmail.com hariharanb6@gmail.com)
[1]Assistant Professor& HOD of Civil Engineering, A.V.C College of Engineering Mannampandal, Tamil Nadu, India.
[2]UG Student, Department of Civil Engineering, A.V.C College of Engineering, Mannampandal, Tamil Nadu, India.

ABSTRACT

Surveying is an important constituent as planning and design of all civil engineering projects such as construction of highways, bridges, tunnels, dams etc are based upon surveying measurements. Many instruments used for layout but Total Stations are very accurate instruments with precise readings and less error. To calculate the horizontal, vertical, distances and angles. Total Stations device are used for station setting up, setting-out many points from one station. It also studiesabout GIS, GPS, and Drone Aerial surveying.The major purpose of this work is to take advantage of total station for setting up building and to establish 2D representation using AutoCAD program. The completion of the work is done in two stages field work & office work. AutoCAD models provided the basic building information such as boundaries, dimensions and positions. The present article shows the surveying using advanced equipment's i.e. Total Station is to be surveyed in our college. Thereby developing the knowledge skill as well as enhanced the knowledge about Modern electronic surveying instruments.

Keywords: Total Station, Surveying, GPS, GIS, Drone Aerial Survey.

1. INTRODUCTION

The Total station instrument is one of the most expensive pieces of equipment used by the survey crew. It should be treated with the same care as any precision instrument. The name Total Station is applied to instruments that combine an Electronic Distance-Measuring (EDM) instrument and a Theodolite. The measurement results can be recorded into the internal memory and transferred to a personal computer interface. The basic properties are unsurpassed range, speed and accuracy of measurements. Total stations are developed in view of the

maximal convenience of work of the user. Angles and distances are measured from the total station to points under survey and the coordinates (X, Y, and Z or northing, easting and elevation)

In the field work: In this stage, the Total Station Sokkia CX 65 was selected for the current study. This device was measured horizontal and vertical distance, elevations, and coordinates from a single set up. This data directly stored on memory.

In the office work: In this stage, AutoCAD program is adopted for design and establish 3D representation of the building to be completely faster and easier.

GPS: It use satellite data to calculate an accurate position on the earth. These calculations can relate the user's position to almost any map projection within milli-seconds.

GIS: The Geographical Information System is a technology that Visualize spatial information& has Power to create maps with images

DroneAerial survey: It is a method of collecting geomatics or other imagery by using aero planes, helicopters…etc.

2. LITERATURE REVIEW

Damani et.al [2015] used Global Positioning System for the tracking and navigation purpose. GPS is mainly used in the military, farming, civil, transportation and commercial users around the world. Here in this review paper, we describe how GPS Tracking System works and where it is useful in real world environment.

Sami H. Ali, Najat Qader Omar[2016] provided recent technological developments surveyors with new high-tech surveying equipment, such as, prism-less total station instruments. The results of the current practical field experiments, computations and analysis of these tests using various calculations and least squares theory (computer adjustment programs, Excel and AutoCAD 2010) are also presented in digital and/or graphical forms.

Sanjeev Gill et.al [2016] presented the way to facilitate and manage surveying instrument theodolite and total station and take more accuracy for civil works methods to accomplish modernized and cost effective urban survey with best achievable accuracy. This is done by surveying methods with

modern methods from both theoretical and practical point of view.

Chun Fui Liew et.al [2017] Presented a review on Recent Developments in Arial Robotics: A survey & Prototypes &also showed show a pie chart and a map of the top ten countries distribution with the most drone papers.

Zhiguo Gao et.al [2017] provided a view on Rapid acquisition and processing method of large scale topographic map data, which relies on the Unmanned Aerial Vehicle (UAV) low altitude aerial photogrammetry system, is studied in this paper, elaborating the main work flow.

3. METODOLOGY

- Study about advanced instrument total station, GIS, GPS, Drone aerial survey
- Surveying to determinate coordinates
- Lamp hole, tree, post, cable, septic tank etc...
- Measuring land
- Drafting
- Plotation of map
- Prepare a project book

4. ADVANTAGES OF TOTAL STATION

Quick setup of the instrument on the tripod by utilizing the laser plummets.

Programmed with on board area computation for computing the area of a field.

It shows the graphical view of land and plots. Data can be saved and transferred to a PC.

Faster work saves time, quick finishing off the job

5. TOTAL STATION TO AUTOCAD

- ✓ Save data into Total station
- ✓ Switch off the machine
- ✓ Transfer data from machine to computer through USB or Pen drive
- ✓ Save raw data in Notepad (txt file)
- ✓ Convert data into Excel format (NTS software)
- ✓ Clear unnecessary data
- ✓ Find coordinates of all the points. Copy all the coordinates from excel to AutoCAD
- ✓ Join all the plotting points.

Process

1.After recording the points, save data in USB Pen drive by connecting it in Total Station. There are two types for data saving, S-type & T-type. In S-type, data will

be saved in Northing, Easting & Z. In T-type, data will be saved in X & Y co-ordinates.

2.In Sokkia Total Station, raw data will be available & then it should be converted into Excel format. While in Topcon Total Station, data will obtain in directly Excel format.

3.In Sokkia Total Station, after transferring raw data to computer save data in Notepad in txt file. Then for converting data into Excel format use NTS software. Open txt file in NTS software and convert.

4.Open the file in Excel, clear all the unnecessary data and convert text to columns. Arrange them in proper order, Northing, Easting, Z & Codes. For finding co-ordinates, insert function = fx concatenate(point) Easting, Northing.

5.After getting co-ordinates, copy all the co-ordinates from Excel to AutoCAD and paste in command bar and join all the plotting point

G	F	E	D	C	B
	No.	Northing (m)	Easting (m)	Elevation (m)	Building Height (m)
	1	441668.786643	3681220.124713	36.936354	
	2	441668.127620	3681226.399681	36.926811	
	3	441666.813427	3681237.589642	36.940314	
	4	441680.610646	3681263.350496	36.926707	
	5	441679.784375	3681272.674341	36.945772	
	6	441662.876491	3681280.346231	36.707903	
	7	441680.011381	3681300.008322	37.034473	
	8	441648.396175	3681302.344292	36.713986	
	9	441650.602186	3681279.045390	36.735115	
	10	441614.582237	3681275.337053	36.697539	
	11	441594.482837	3681297.593399	36.653147	
	12	441589.373437	3681351.417734	36.607353	7.6
	13	441620.253406	3681215.558396	36.579831	
	14	441689.703670	3681300.844621	36.882775	
	15	441691.437152	3681282.771181	36.884775	
	16	441715.355158	3681284.992829	36.845314	
	17	441717.651791	3681284.454807	36.835250	
	18	441715.469121	3681284.727630	36.838111	
	19	441716.336382	3681276.224664	36.847435	
	20	441729.094599	3681267.933118	36.780157	
	21	441728.247455	3681276.973067	36.800199	
	22	441727.092971	3681285.427219	36.812762	
	21	441728.247455	3681276.973067	36.800199	
	22	441727.092971	3681285.427219	36.812762	
	23	441668.616611	3681219.925433	36.886354	
	24	441662.456431	3681280.046217	36.697903	

6. CONCLUSION

From the results obtained in this work the following conclusions have been made: Total Station very accurate and less manual operations will be carried out. In Total Station Co-ordinates is directly known and available in excel format and to draw easily in AutoCAD. Site work and office work done simultaneously.

7. REFERENCE

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