



KG REDDY
College of Engineering
& Technology

**CERTIFICATION COURSE IN CIVIL ENGINEERING WITH
SPECIALIZATION
IN
“APPLICATIONS OF TOTAL STATION”
HELD ON
05 March 2018 to 10 March 2018**



**Department of Civil Engineering
KG Reddy College of Engineering & Technology**

Chilkur (village), Moinabad (Mandal), RR Dist-501504

Sari
Co-ordinator

[Signature]
Principal
— **Principal**
KG Reddy College of Engineering & Technology
Chilkur (V), Moinabad (M).
R.R.Dist., Telangana.



SUMMARY REPORT OF APPLICATIONS OF TOTAL STATION

About course

The certification course on Applications of Total Station in Civil Engineering is concluded its work successfully by Department of Civil Engineering in KG Reddy College of Engineering and technology, Hyderabad, Telangana. This course contributed additional knowledge of students regarding practical design of buildings.

A total station (TS) or total station theodolite (TST) is an electronic/optical instrument used for surveying and building construction. It is an electronic transit theodolite integrated with electronic distance measurement (EDM) to measure both vertical and horizontal angles and the slope distance from the instrument to a particular point, and an on-board computer to collect data and perform triangulation calculations

Robotic or motorized total stations allow the operator to control the instrument from a distance via remote control. This eliminates the need for an assistant staff member as the operator holds the retro reflector and controls the total station from the observed point. These motorized total stations can also be used in automated setups known as Automated Motorized Total Station (AMTS).

Scope of the Course:

Total Station is very commonly used surveying equipment in construction industry; hence this course makes students aware of surveying using Total Station and input the result of Total Station to computer using microstation software for drafting and make efficient to students to work in surveying.

The primary objective of the course is to give training on total station which is an electronic/optical instrument used in modern surveying and building construction.

A Total Station or TST (total station theodolite) is an electronic/ optical instrument used in modern surveying and building construction. The total station is an electronic theodolite (transit) integrated with an electronic distance measurement (EDM) to read slope distances from the instrument to a particular point. Total stations are mainly used by land surveyors and civil engineers, either to record features as in topographic surveying or to set out features (such as roads, houses or boundaries).

Total stations are mainly used by land surveyors and Civil Engineers, either to record features as in topographic surveying or to set out features (such as roads, houses or boundaries). Total Stations are also used by Archaeologists to record excavations. The Total station is designed for measuring of slant distances, horizontal and vertical angles and elevations in topographic and geodetic works, tachometric surveys, as well as for solution of application geodetic tasks. 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 maximum convenience of

work of the user. High efficiency electronic tachometers are intended for the decision. It has the broad audience for sole of industrial problems.

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) of surveyed points relative to the total station position are calculated using trigonometry and triangulation. Data can be downloaded from the total station to a computer and application software used to compute results and generate a map of the surveyed area.

The purpose of any survey is to prepare maps; control points formed a basic requirement for the preparation of these maps.

Objectives of the Course:

The main objective of this workshop is hands on training in Total Station to give a complete picture on the basics of modern surveying trends and its applications in planning construction, and architectural areas. The students will learn to use the major tools available with Total Station and train to do field survey data collection in practical situations. Students will expose

- To make students efficient in surveying using Total Station
- To make students use different functions of Total Station depending on purpose and make surveying fast.
- To gain the knowledge on applications of Total Station
- To have a practical approach for create a detailed Topographical Maps with contours.
- To determine angle measurement.
- To determine distance measurement.
- To determine co-ordinate measurement.

Outcomes:

- Identify the environmental, equipment, and human factors affecting the accuracy of electronic distance measurement equipment
- Explain the conditions under which the variable length error of EDMs (in parts per million) have minimal effect on accuracy compared to the “fixed” error of equipment
- Discuss the difference between the capabilities of a Total Station and instruments used only for electronic distance measurement
- Students will be efficient in surveying using Total Station
- Students will be able to use different functions of Total Station depending on purpose and make surveying fast.
- Students gain practical approach for create a detailed Topographical Maps with contours.



KG REDDY
College of Engineering
& Technology

- Students can determine angle measurement, distance measurement, co-ordinate measurement.

Summary of Participants

- i) Number of students attended this course : 53
- ii) Number of students received certificates : 53

Day-1
(05-03-2018)

Time: 09:00 AM to 10:00 AM

Inauguration of the course

The first day of certificate course started with welcoming and opening ceremony at KGR CET conference hall. Welcoming speech was given by Dr.T.S. Ramesh Babu and objectives to be achieved in the course were discussed.

The following dignitaries were present on the dais for opening ceremony. College intension for conducting certificate course by Principal Dr.R. S. Jahagirdar Importance of this course by expert trainer Mr. Mahesh Appa. Mr. K. Thanga Mani gave short speech on how companies are using Total Station.

Time: 10:30 AM to 04:00 PM

Introduction to total station

The workshop started with introduction to the opportunities for fresher's in the field of surveying and the basics of surveying. The remaining days covered the topics on the basic options and usage of Total station instrument. They were practically taught the measurement of horizontal and vertical distance and how to find out the area and height of the building. The difference between two equipments and the reflector and prism types used according to the practical difficulty in fixing them was taught. Practically the students itself handled the instrument and made use of the workshop efficiently.



Day-2
(06-03-2018)

PRINCIPLE AND INSTRUMENTATION OF TOTALSTATION

Given the co-ordinate of the instrument position and bearing of a backward station the co-ordinates of any other point can be computed.

It consists of an EDM, Theodolite, Microprocessor combined into one. It also has a memory card to store the data. It also consists of battery socket which houses the battery. A fully charged battery works for about 3 to 5 hrs continuously.



Day-3
(07-03-2018)

ACCURACY AND PRECISION

- Precision is the reproducibility of the measurement.
- Accuracy is how close the measured position is to the actual location

Measurement of distance is accomplished with a modulated microwave or infrared carrier signal, generated by a small solid-state emitter within the instrument's optical path, and reflected by a prism reflector or the object under survey. The modulation pattern in the returning signal is read and interpreted by the onboard