



MOTHER TERESA
INSTITUTE OF SCIENCE AND TECHNOLOGY
Approved by AICTE, Govt. of Telangana, Affiliated to JNTUH & SBTET, Hyderabad
Recognition under Section 2(f) & 12 (B) of the UGC Act, 1956
SANKETIKA NAGAR, KOTHURU (V), SATHUPALLY – 507303, KHAMMAM Dist., TELANGANA
Phone : 9494641251, Email ID : info@mistech.ac.in



DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR: 2019-20

A SUMMARY REPORT

Course Name: A Workshop on an “Advanced Survey Total Station”

Name of the Resource Person: Mr.D.Prasad & Mr. B.Naveen, Surveying Trainers
NAC academy, Hyderabad

Gap Identified: Modern Tool Usage.

No. of Students attended: 107 members (III year students-37 + IV year students -25 + II year students-45 = 82) =107 members

Summary: On the workshop overall of the sessions conducted (i.e 02-03-2020 to 19-03-2020) Mr. Mr.D.Prasad & Mr. B.Naveen, Surveying Trainers, NAC academy, Hyderabad. Delivered a workshop on the basics of Introduction to the course to an advanced survey total station. It is an optical instrument used in modern surveying. It is a combination of an electronic theodolite and electronic distance meter and software running on an external computer know as data collector. This is an electronic instrument. In this instrument, all the parameters required to be observed during surveying can be obtained. The value of observation gets displayed in a viewing panel. The precision of this type of instrument varies in the order of 0.1" to 10". Total station surveying - defined as the use of electronic survey equipment used to perform horizontal and vertical measurements in reference to a grid system. It is also a form of an electronic theodolite combined with an electronic distance measuring device (EDM).

These instruments can record horizontal and vertical angles together with slope distance and can be considered as combined EDM plus electronic theodolite. The microprocessor in TS can perform various mathematical operations such as averaging, multiple angle and distance measurements, horizontal and vertical distances, X, Y, Z coordinates, distance between observed points and corrections for atmospheric and instrumental corrections. Due to the versatility and the lower cost of electronic components, future field instruments will be more like total stations that measure angle and distance simultaneously having: o all capabilities of theodolites o electronic recording of horizontal

and vertical angles o Storage capabilities of all relevant measurements (spatial and non-spatial attribute data) for manipulation with computer

Nowadays surveying systems are available which can be use in an integrated manner with Global Positioning System (GPS). Hence, future theodolites/total stations may have integrated GPS receivers as part of the measurement unit



Advantages of Total Station:

Relatively quick collection of information Multiple surveys can be performed at one set-up location. Easy to perform distance and horizontal measurements with simultaneous calculation of project coordinates (Northings, Eastings, and Elevations). Layout of construction site quickly and efficiently. Digital design data from CAD programs can be uploaded to data collector. Daily survey information can also be quickly downloaded into CAD which eliminates data manipulation time required using conventional survey techniques.

Disadvantages of Total Station:

Vertical elevation accuracy not as accurate as using conventional survey level and rod technique. Horizontal coordinates are calculated on a rectangular grid system. However, the

real world should be based on a spheroid and rectangular coordinates must be transformed to geographic coordinates if projects are large scale.

Examples: highways, large buildings, etc. As with any computer-based application “Garbage in equals Garbage out”. However, in the case of inaccurate construction surveys “Garbage in equals lawsuits and contractors claims for extras.” Field techniques with TS: Various field operations in TS are in the form of wide variety of programs integrated with microprocessor and implemented with the help of data collector. All these programs need that the instrument station and at least one reference station be identified so that all subsequent stations can be identified in terms of (X, Y, Z).

Typical programs include the following functions:

- Point location
- Slope reduction
- Missing line measurement (MLM)
- Resection• Azimuth calculation
- Remote distance and elevation measurement
- Offset measurements
- Layout or setting out operation
- Area computation
- Tracking



FUNCTIONS PERFORMED BY TOTAL STATIONS:

Total Stations, with their microprocessors, can perform a variety of functions and computations, depending on how they are programmed. The capabilities vary with different instruments, but some standard computations include: Averaging multiple angle and distance measurements. Correcting electronically measured distances from prism constant, atmospheric pressure, and temperature. Making curvature and refraction corrections to elevations determine by trigonometric leveling. Reducing slope distances to their horizontal and vertical components. Calculating point elevations from the vertical distance components (supplemented with keyboard input of instrument and reflector heights). Computing coordinates of survey points from horizontal angle and horizontal distance.

1. Averages multiple angle measurements.
2. Averages multiple distance measurements.
3. Computes horizontal and vertical distances.
4. Corrections for temp, pressure and humidity.
5. Computes inverses, polars, resections.
6. Computes X, Y and Z coordinates.

Applications of Total Station:

There are many other facilities available, the total station can be used for the following purposes. Detail survey i.e., data collection. Control Survey (Traverse). Height measurement (Remove elevation measurement- REM). Fixing of missing pillars (or) Setting out (or) Stake out. Resection. Area calculations, etc. Remote distance measurement (RDM) or Missing line measurement (MLM).



Coordinator

Head of the Department



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Dt: 19-03-2020.

To
Mr. D.Prasad & Mr. B. Naveen
Surveying Trainers
NAC academy,
Hyderabad.

Sub: Letter of Appreciation– Reg.

Dear Sir,

We would like to thank you for being delivered the course on modern tool usage For a Programme on A Workshop on an “**Advanced Survey Total Station**” on 02nd Mar, 2020 to 19th Mar, 2020. Organized by Department of Civil Engineering Conducted at Mother Teresa Institute of Science and Technology. Your views on new research areas in Civil Engineering and assessing the outgrowing needs in a competitive challenging environment helps the students to explore the industrial challenges.

Thanking you

With Regards