جامعة الفرات الاوسط التقنية /المعهد التقني سماوة

قسم / تقنيات المساحة

المحاضرة الثالثة عشر

اسم المادة / المساحة-٢

المرحلة الدراسية / الثانية

العام الدراسي / 2022 - 2023

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Total station Surveying

- A total station in surveying is an inventory and control device used to take your measurements digitally. The data collected by a total station is displayed on a control unit, controlling its elements utilizing software and technology.
- Total stations are only to be used by trained people who know to be safely used in construction sites or at the workplace where they understand what the use may bring.

Type of surveying

1. Distance Measurement

- Electronic distance measuring (EDM) instrument is a major part of total station. Its range varies from 2.8 km to 4.2 km. The accuracy of measurement varies from 5 mm to 10 mm per km measurement. They are used with automatic target recognizer. The distance measured is always sloping distance from instrument to the object.

Type of surveying

2. Angle Measurements

- The electronic theodolite part of total station is used for measuring vertical and horizontal angle. For measurement of horizontal angles any convenient direction may be taken as reference direction. For vertical angle measurement vertical upward (zenith) direction is taken as reference direction. The accuracy of angle measurement varies from 2 to 6 seconds.

Type of surveying

3.Data Processing

- This instrument is provided with an inbuilt microprocessor. The microprocessor averages multiple observations. With the help of slope distance and vertical and horizontal angles measured, when height of axis of instrument and targets are supplied, the microprocessor computes the horizontal distance and X, Y, Z coordinates. The processor is capable of applying temperature and pressure corrections to the measurements, if atmospheric temperature and pressures are supplied.

Type of surveying

4. Display

- Electronic display unit is capable of displaying various values when respective keys are pressed. The system is capable of displaying horizontal distance, vertical distance, horizontal and vertical angles, difference in elevations of two observed points and all the three coordinates of the observed points.

Type of surveying

5. Electronic Book

- Each point data can be stored in an electronic notebook (like compact disc). The capacity of electronic notebook varies from 2000 points to 4000 points data. Surveyor can unload the data stored in notebook to computer and reuse the notebook.

Total station operation in a surveying context

- Instead of two dimensions, as was typically the case with surveying tools, the complete station enables surveyors to produce a map of a location in three dimensions.
- The name “1-Point” refers to this capacity; each point measured by a complete surveying method is referred to as one dimension and designates a distinct location on the ground. A total station’s lenses, movable vertical laser levels, and bubble axes give it exceptional precision and range.
- A tool for surveying is the complete station. To determine the levels and distances of the sites it is set over, the equipment largely depends on geo-radar and time signals.

Total station operation in a surveying context

- The prism is used to calculate the angles involved in triangulation and quick placement and is used to measure the heights or sections of the objects.
- The complete station is used for a wide variety of engineering and construction-related tasks in surveying.
- The use of the total station is widespread, including in the fields of civil engineering, architecture, site engineering for building projects, traffic engineering, and airport planning. In addition, transportation management systems make use of it.