





CE331 Lab 6 : Mapping using Total Station

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Objective

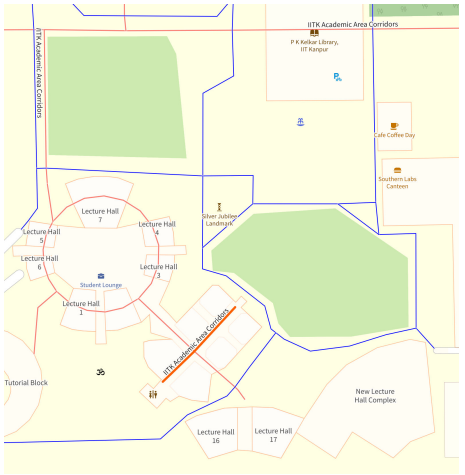
Lab Exercise 6 : Mapping using Total Station

- Map an area using Total Station
- Understand the following:
  - Total Station components and their function
  - Recording Easting, Northing, and Elevation
  - Map/Contour field observations

Equipment

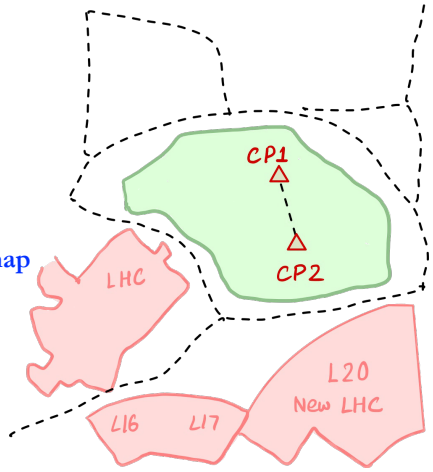
- Total Station
- Reflector/Target
- Measuring Tape
- Tripod & Pegs





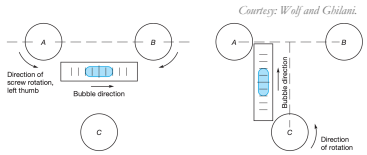
Procedure

- Choose two CPs (Control Points)
- Temporary adjustment of total station
- Creation of Job file
- Referencing/Targeting
- Observations (Aiming and Measurement)
- Transfer of data to computer
- Use of mapping software to prepare the final map



Setup, Job File Creation and Referencing

- Temporary adjustment and initialization of total station
  - Set up the Total Station on a stable tripod
  - Level the instrument using both circular and electronic bubbles
  - Initialize with appropriate values (Temperature, Pressure, etc.)



- Creation of Job file
  - Go to *General Survey → Jobs → New Job*
  - Create a job file to record the survey data
  - Example: *CE331_2024_Tuesday_G2*
  - Use the same file for all observations in the lab
  - Ensure all data is saved under same job file



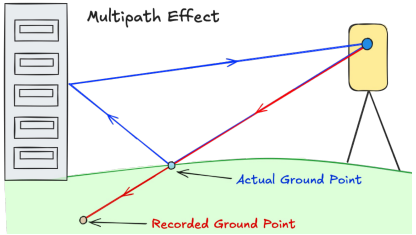
- Referencing/Targeting
  - Input instrument's starting coordinates: *Northing (Y) = 1000, Easting (X) = 1000, Elevation (Z) = 100*
  - Measure the height of the instrument (HI)
  - Sight the reference target to another CP
  - Set the horizontal angle (HA) reference to 0° (Azimuth)

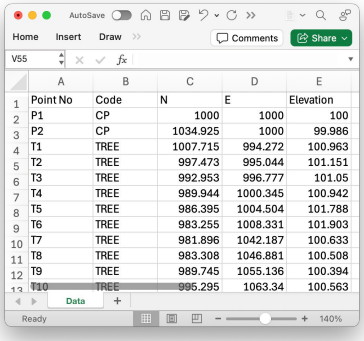
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Recording Observations

- Observations (Aiming and Measurement)
  - Place reflector on points of interest (ground features, buildings)
  - Aim the Total Station at the reflector
  - Press *Measure* to record coordinates (N, E, Elevation)
  - Save data in the job file
  - Label features properly (e.g., T1 for Tree 1)
  - Give unique code to similar features
  - Capture additional ground points for contour mapping





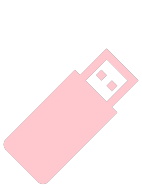


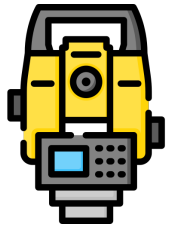
	A	B	C	D	E
1	Point No	Code	N	E	Elevation
2	P1	CP	1000	1000	100
3	P2	CP	1034.925	1000	99.986
4	T1	TREE	1007.715	994.272	100.963
5	T2	TREE	997.473	995.044	101.151
6	T3	TREE	992.953	996.777	101.05
7	T4	TREE	989.944	1000.345	100.942
8	T5	TREE	986.395	1004.504	101.788
9	T6	TREE	983.255	1008.331	101.903
10	T7	TREE	981.896	1042.187	100.633
11	T8	TREE	983.308	1046.881	100.508
12	T9	TREE	989.745	1055.136	100.394
13	T10	TREE	995.295	1063.34	100.563

Note: *While recording ground points for contours, always measure by a reflector target.*

Data Transfer

- Transfer of data to computer
  - Connect USB-Pen Drive to the Total Station
  - Tap *General Survey → Jobs → Import/Export → Export fixed format*
  - File format: *Comma Delimited (*CSV,*.TXT)*
  - Choose file name and location
  - Set fields in the order you need them
  - Tap *Accept*
  - Save the recorded data
  - Transfer the data to a computer



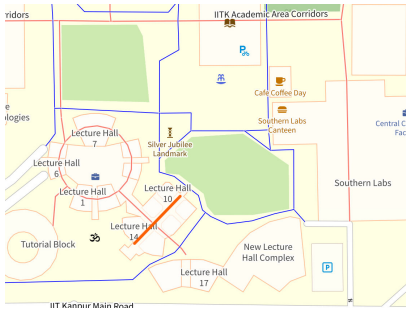


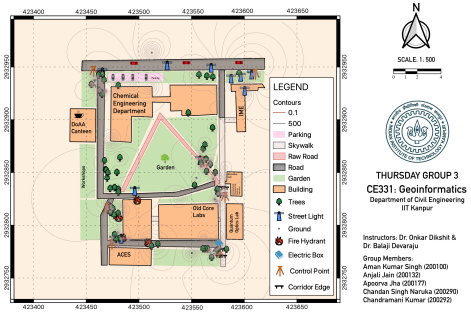


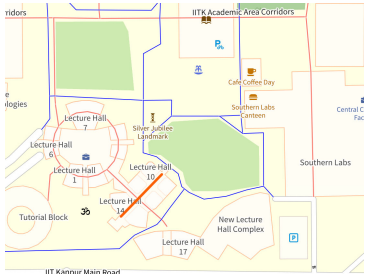
Mapping

- Use of mapping software (SW) to prepare the final map
  - Use QGIS to create a contour map
  - Import the recorded data and configure symbols for different features
  - Plot the points and generate contour lines to visualize the area
  - Download QGIS from https://qgis.org/download/

QGIS









Thank you



Comments and Questions?
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