

# Surveying Engineering

## Lecture 4: Traversing-1

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# Steps for performing a detail map

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## A) Field Work

- 1- Choice of control points
- 2- Measurement of baselines and checklines
- 3- Detailing of all baselines in field
- 4- Choice of map size

## B) Office Work

- 1- Choice of map scale
- 2- Drawing of baselines and check lines on map
- 3- Setting out all detailed features for each baseline
- 4- Connect all features for all baselines

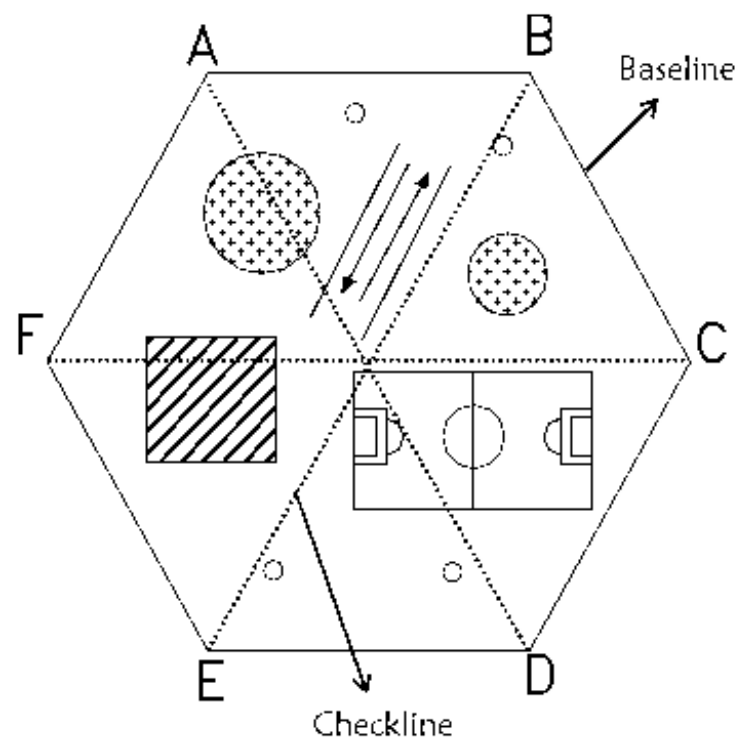


# Traverse Definition

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A traverse consists of baselines and checklines joining control (Traverse) points surrounding the area required to be surveyed considered as reference for detailing, coordinate computation and map drawing.

The coordinates of traverse points has to be accurately determined and adjusted.





# Steps of Establishing a Traverse

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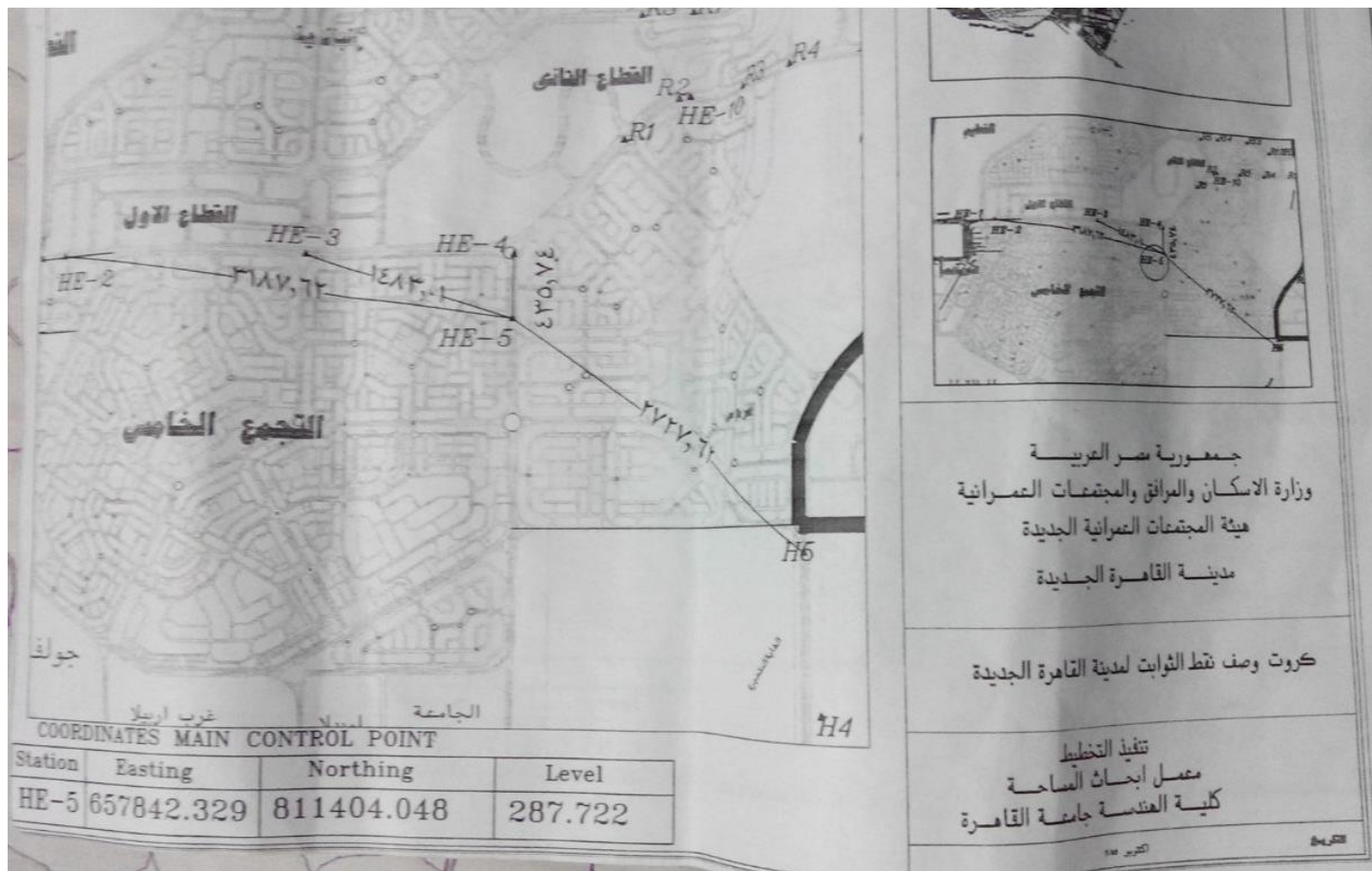
- 1- Reconnaissance of the site
- 2- Choice of Traverse stations
- 3- Proper fixation of traverse stations
- 4- Description card of each traverse station
- 5- Measurement of traverse internal or external angles using Theodolite
- 6- Measurement of traverse baselines using Tape or EDM
- 7- Traverse calculations and adjustment

# Steps of Establishing a Traverse





# Description card





# Factors affecting choice of traverse control points

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- 1- Beneficial to surveying task
- 2- Safe and accessible
- 3- Properly fixed
- 4- Well distributed
- 5- Minimum possible
- 6- Highest possible
- 7- Ratio between max. and min distance 1:3 – 1:5
- 8- Each point sights the point before and after





# Types of Traverses

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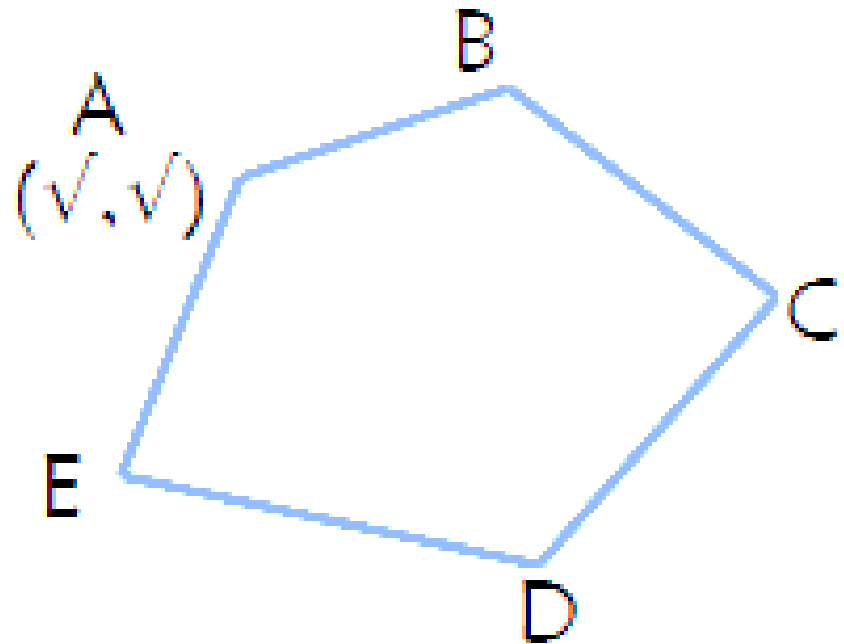
Closed Traverse: Starts from a known control point and ends at the same control point

$$\sum \Delta E = \sum \Delta N = \text{Zero}$$

$$\sum \text{internal angles} = (n - 2) * 180$$

$$\sum \text{external angles} = (n + 2) * 180$$

(n = no. of traverse points)





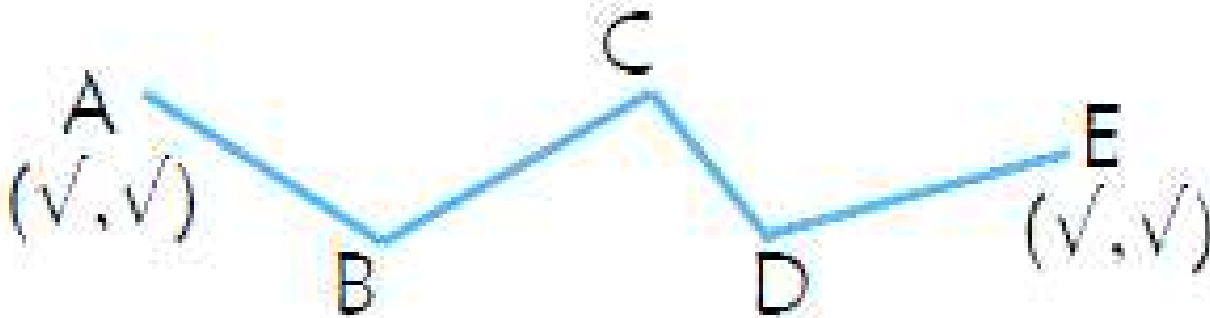
# Types of Traverses

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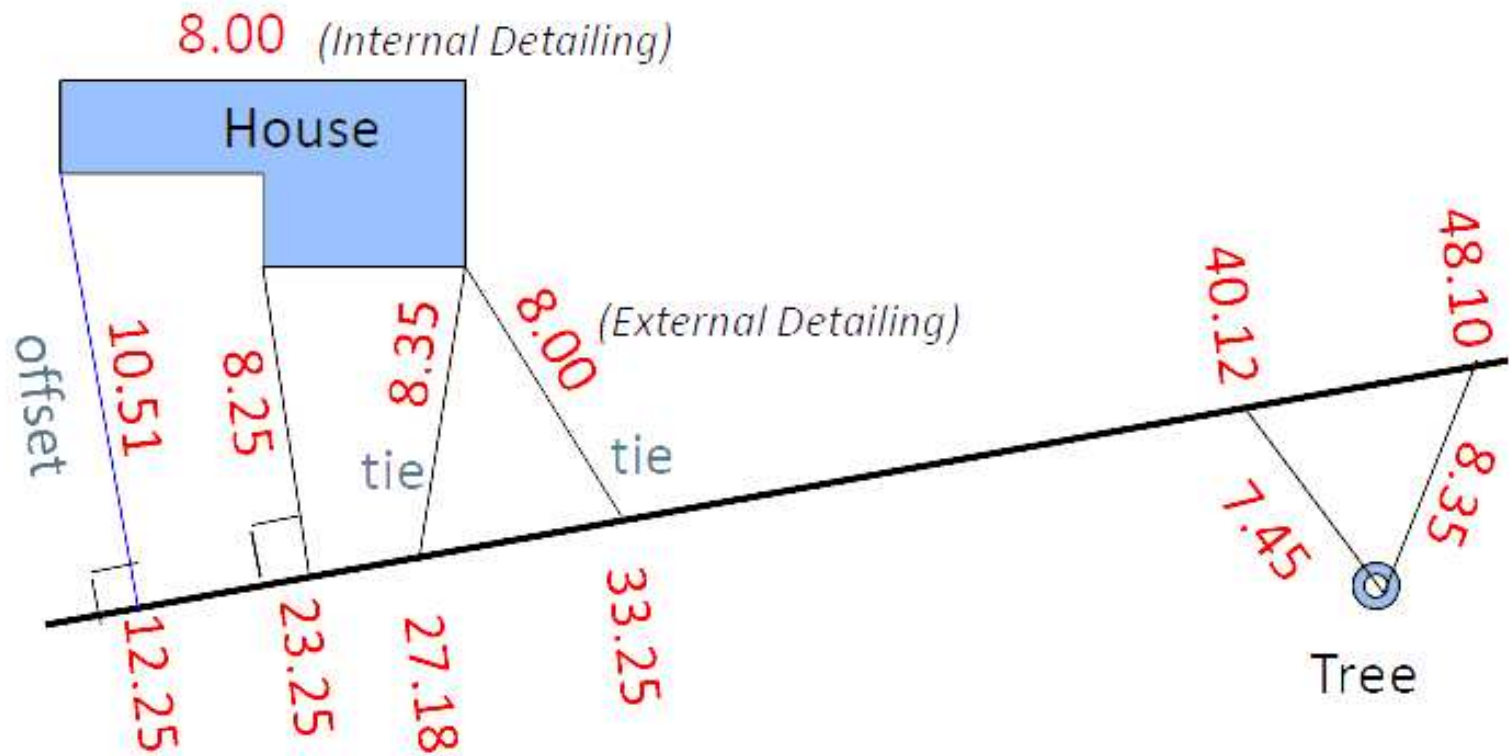
Connected Traverse: Starts from a known control point and ends at another control point

$$\Sigma \Delta E = E_{\text{last}} - E_{\text{first}}$$

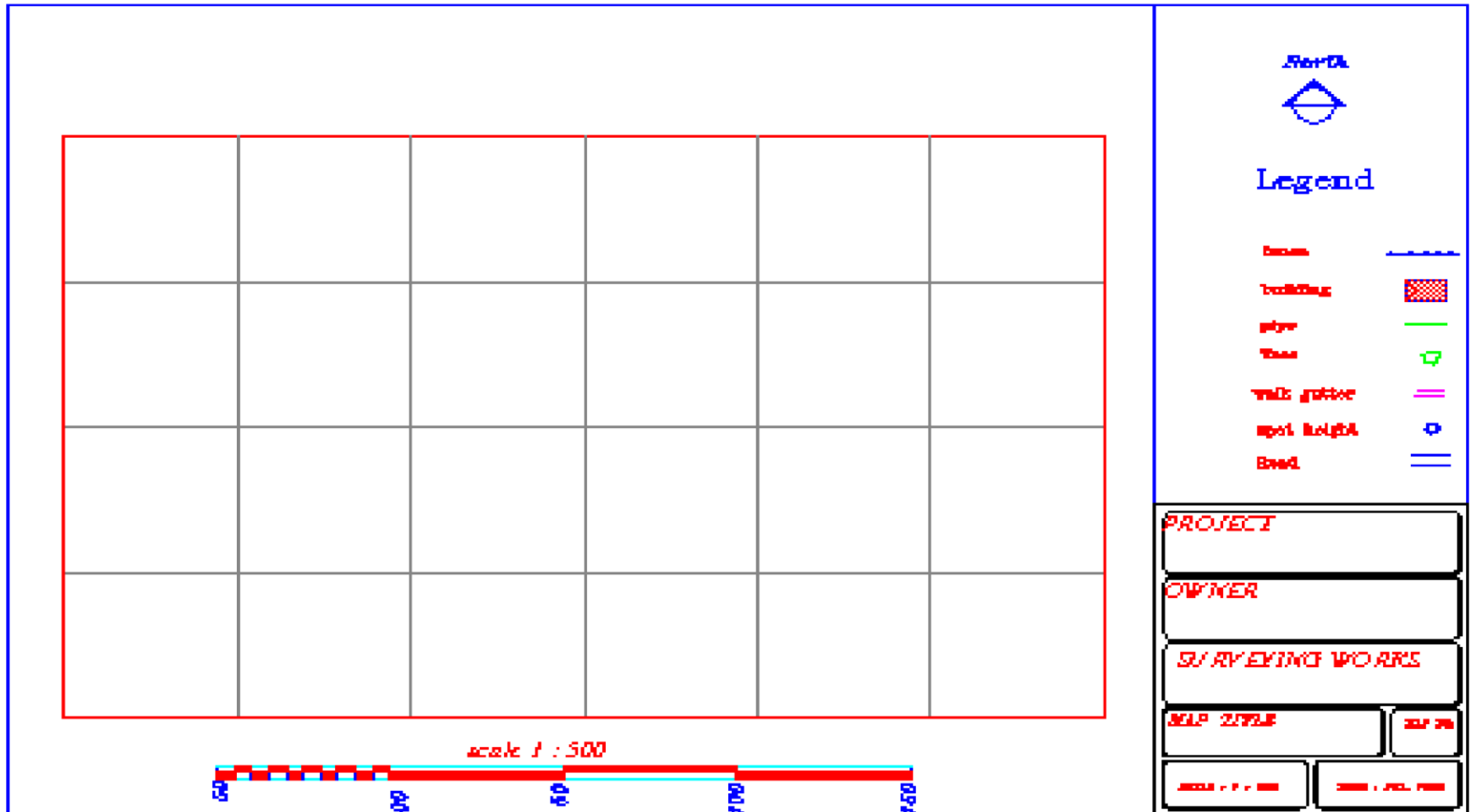
$$\Sigma \Delta N = N_{\text{last}} - N_{text{first}}$$



# Detailing



# Base Map





# Supplementary files:

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- <https://www.youtube.com/watch?v=K6-xzp2c-Fc>
- <https://www.youtube.com/watch?v=zmH44jxiCYg>
- <https://www.youtube.com/watch?v=nD8gVla1kfY>

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***Thanks***

**Dr.Eng. Hassan Mohamed**