Profile Leveling

- Profile leveling yields elevations at definite points along a reference line.
- Used in designing linear facilities:
  - Highways
  - Railways
  - Transmission lines
  - Canals
  - Sewers
  - Water mains
Staking and Stationing the Reference Line

Reference Line (RL) can be:

♦ A single straight segment (*Short sewer line*)

♦ A series of connected straight segments which changes direction at angle points (*transmission line*)

♦ Straight segments joined by curves (*highways and railways*)
Staking and Stationing the Reference Line

To Stake the proposed RL

♦ Staring, ending and angle points will be set first

♦ Intermediate stakes will be placed on line (50 to 100 ft English units or 10 to 40 m SI units)

♦ Distances for staking will be taped, measured (using EDM …)

Example of staking and stationing the RL
Example of Profile leveling

Figure 5.10 (textbook)
Lab Procedure

Long Pond

Site
Lab Procedure

Layout a 100 m long straight line (starting at your starting point) and mark out stations by 20 m intervals along it.

0+00  0+20  0+40  0+60  0+80  1+00

Mark out the reference line at 10 m wide cross section perpendicular to the line at each of the 20 m stations.
Lab Procedure

Setup the instrument 40 to 50 m from your initial BM and take a BS and Intermediate Fore Sights (IFS) of each of the 20 m stations and the associated cross sections.

\[ HI = BM + BS \]

\[ Elev. = HI - IFS \]
### CROSSE-SECTION LEVELING

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<th>Sight</th>
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### HONOLULU-KAILUA HIGHWAY

Warm, Sunny 70°  
A.C. Chun  
Diamond Highway  
R. E. Nielan  
C. Grube  
M. L. Hagawa  
Litz level #10

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Sample field note:

- BM Pod: Kalani Valley, Oahu. Eastmost corner.
- Hibiscus and Kawa Drive, Spike in 30° monkey pod tree, 2 ft. above ground.
Lab Procedure

Plot the profile of the reference line and the perpendicular cross sections on the graph papers (*see sample plot below*)

![Graph of profile and gradient](image)

Calculate the gradient of the reference line

*Gradient* = change in *elev*/100.

Slope = change in *elev*/100.